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Breast Cancer

Introduction

Breast cancer has become the most common cancer among women in the United States, excluding skin cancers, and the second leading cause of cancer death among North American women. Screening for breast cancer and breast cancer prevention has important and measurable effects on the morbidity and mortality associated with breast cancer.

Physicians have important roles in communicating the options, risks and benefits, and potential outcomes of these procedures and interventions. Applying accepted screening recommendations and prevention strategies allows physicians to help their patients reduce their risk of developing breast cancer, increase breast cancer detection at an early stage, and improve clinical outcomes.

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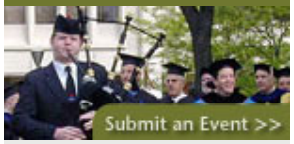

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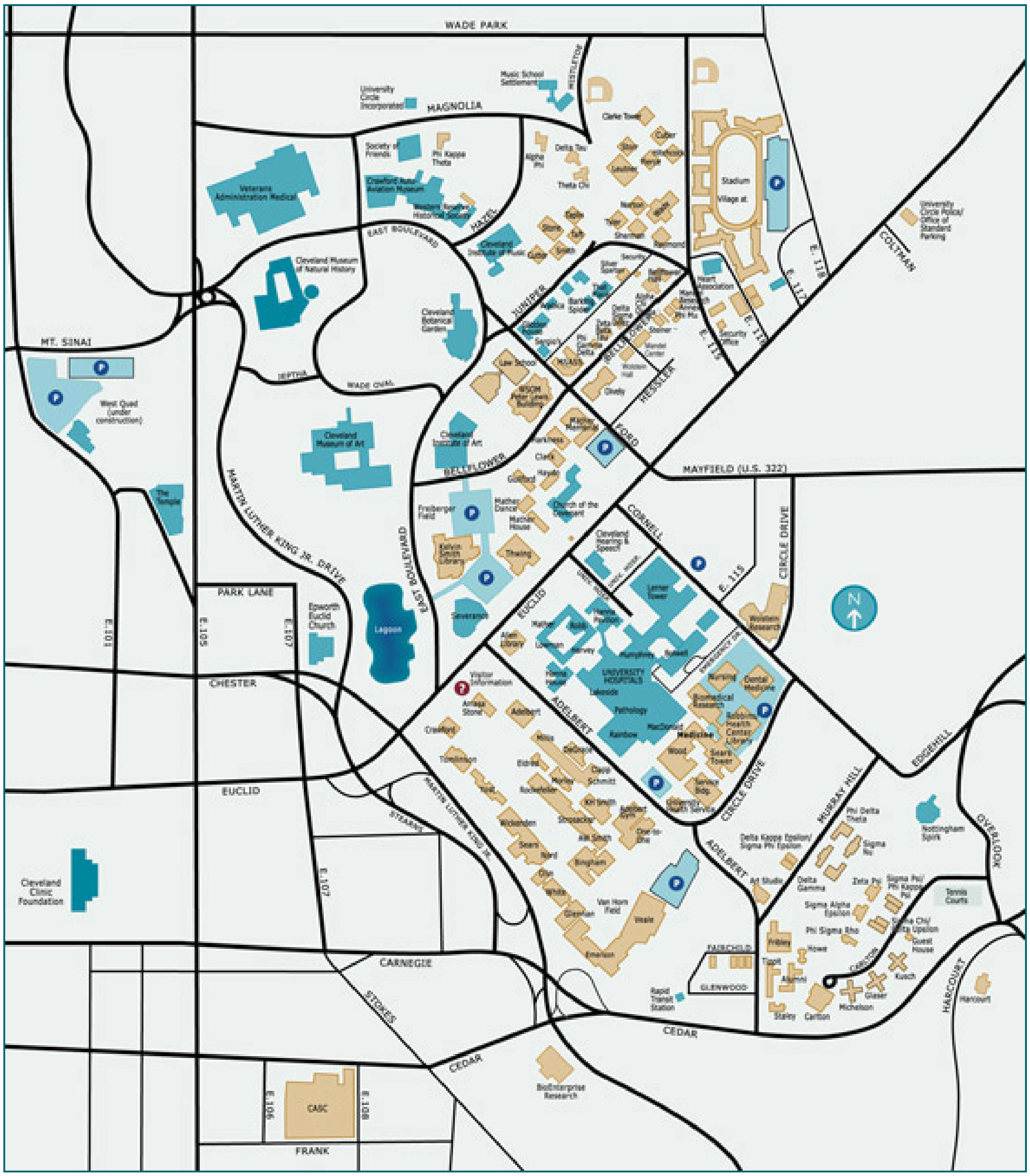

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

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Breast Cancer

Epidemiology

Prevalence

- The prevalence of breast cancer in the US is estimated at 0.6-1.0% of the general population undergoing screening.

Incidence

- In the US, a woman's probability of developing breast cancer in her lifetime is 1 in 7.
- Incidence of female breast cancer is age-specific, with increasing incidence rates peaking between 75-79 years.
- From 1996-2000, women ages 75 to 79 years had the highest incidence rate, 499 cases per 100,000 population, while women between the ages of 20-24 had the lowest incidence rate, 1.4 cases per 100,000 population.
- From 1996 to 2000, 94% of new breast cancer cases and 96% of breast cancer deaths occurred in women ages 40 and older.
- Estimates for total new breast cancer cases in the US for 2003 are 267,000, with 55,700 insitu cases, and 211,300 invasive cases.
- The incidence rates of invasive breast cancer over the last 30 years have demonstrated three distinct phases. From 1973 to 1980 incidence was essentially constant. Incidence increased by almost 4% per year between 1980 and 1987. This increase is attributed to the increased use of mammography screening and the subsequent detection of nonpalpable cancers. Rates between 1987 and 2000 increased by approximately 0.4% per year. Total increasing trends over this 30 year period are attributed to changes in reproductive patterns, including having fewer children and delaying childbearing.

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Breast Cancer

Epidemiology

Risk Factors

- **Gender:** Gender is the main risk factor for developing breast cancer, with less than 1% of all breast cancers occurring in men.
- **Age:** Among women, age is the most significant risk factor, with increasing incidence and mortality with age. Seventy-seven percent of women with breast cancer are older than 50 years of age when they are diagnosed.
- **Race:**
  - Whites have a greater incidence of breast cancer than African Americans after age 40 years. However, before age 40, this trend is reversed.
  - Asian, Hispanic, and Native American women have a lower risk of developing breast cancer.
  - Women of Ashkenazi Jewish descent have a higher risk than whites of developing breast cancer. **Cancer Spectrum: Warner et al., pp. 1241-1247.**

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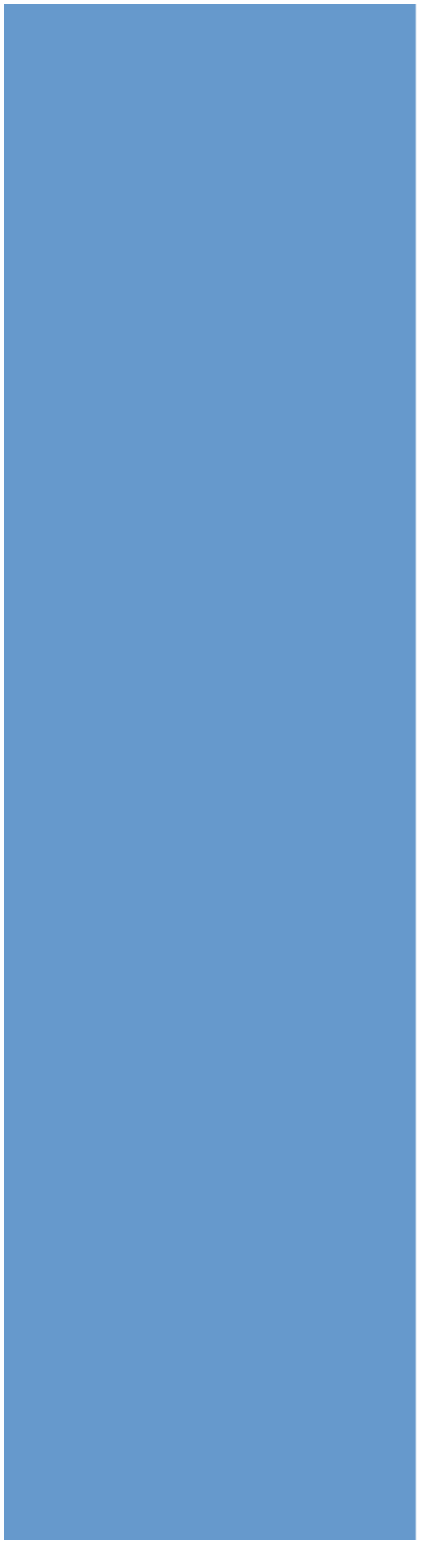

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Breast Cancer

Epidemiology

Risk Factors *(continued—)*

- **Family History:** Women having first-degree relatives (mother, sister) with breast cancer have a greater risk of developing breast cancer themselves. Relative risks increase from 2.1 to 4 with one first degree relative and greater than 4 times the relative risk with two first-degree relatives. The risk is even greater if the relatives developed breast cancer before the age of 40 years or had bilateral breast cancer.
  - Inherited mutations, such as BRCA1 and BRCA2, account for approximately 5% to 10% of breast cancer cases. BRCA1 mutations are present in approximately 0.1% of the general population, compared with 20% of the Ashkenazi Jewish population. Women with a BRCA1 or a BRCA2 mutation have up to an 85% lifetime risk of developing breast cancer.
  - Scientists believe that the occurrence of most breast cancer in families is due to similar lifestyles and low-risk variations in genetic susceptibility.
- **History of Other Cancers or Pathology:**
  - Women with a history of breast cancer have a four-fold risk increase of developing a new breast cancer in the same or opposite breast (not recurrence).
  - Women with a history of ovarian, endometrial or colon cancer are at increased risk of developing breast cancer, up to 2 times the relative risk.

- A previous biopsy of the breast indicating ***atypical hyperplasia*** increases a woman's risk of developing breast cancer by 4 to 5 times.

- **Years of Menstruation:** Any factors that increase the number of menstrual cycles in a woman's lifetime increase a woman's risk of developing breast cancer. This increase in risk is associated with increased lifetime exposure to estrogen.
  - Nulliparity
  - Fewer number of pregnancies
  - First full-term pregnancy after 30 years of age
  - Never breast fed
  - Menarche beginning at below 12 years of age
  - Menopause occurring at above 55 years of age

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Breast Cancer

Epidemiology

Risk Factors *(continued—)*

- **Exogenous and Lifestyle-Related Factors-Opportunity for Primary Prevention:** Other factors that demonstrate an effect on relative risk of women developing breast cancer include; hormone replacement therapy, oral contraceptive use, obesity, alcohol consumption, low physical activity, irradiation of the chest. These factors may be modifiable and present an opportunity for the patient and physician to minimize a woman's individual risk of developing breast cancer.

  - **HRT:** The Women's Health Initiative has reported an increased risk of breast cancer related to the use of combined HRT (estrogen and progesterone). Not only was breast cancer risk increased, but the study also determined that breast cancer was also diagnosed at a more advanced stage. A woman's relative risk for developing breast cancer is 1.35 after 10 years of HRT use. Risk seems to return to that of the general population 5 years after discontinuing HRT. **Collaborative Group on Hormonal Factors in Breast Cancer**

  - **Oral Contraceptives:** Recent use of oral contraceptives may slightly increase a woman's risk of developing breast cancer. However, women who have not used oral contraceptives for more than 10 years, have the same risk as women who have never used oral contraceptives. **Oral Contraceptive and Reproductive System Cancer**

  - **Obesity:** It is believed that adipose tissue promotes androgen to estrogen conversion, increasing a woman's overall lifetime exposure to estrogens. An American Cancer Society study demonstrated that overweight women are 60% more likely to die from breast cancer

when compared to normal weight women. The increased risk of breast cancer appears to be linked to postmenopausal obesity. **ACS :: Major New American Cancer Society Study Links Obesity to Increased Cancer Death Risk**

- **Physical Activity:** The effect of physical activity on the risk of developing breast cancer is a relatively new area of research. Studies indicate that strenuous exercise during a woman's youth may provide life-long protection, while moderate to strenuous activity as an adult may lower breast cancer risk. **Lifetime Physical Activity and Breast Cancer Risk**

- **Alcohol Consumption:** American Cancer Society reports that 2 drinks per day (24g of alcohol) may increase breast cancer risk by approximately 21%. The exact mechanism is unknown. Alcohol may increase estrogen and androgen levels in the body or it may induce genome instability leading to chromosomal abnormalities that increase breast cancer risk. **Alcohol, Genome Instability and Breast Cancer**

- **Socioeconomic Status:** Women with higher socioeconomic level appear to have a higher risk of developing breast cancer, after controlling for other identifiable risk factors, than women in lower socioeconomic groups. It remains unclear why this disparity exits. **Socioeconomic Risk Factors for Breast Cancer**

- **Radiation to the Chest:** The American Cancer Society reports that women who receive high-dose radiation to the chest for the treatment of lymphoma have a 2.1 to 4.0 relative risk of developing breast cancer. Studies looking at the effect of mantle field radiation therapy support these findings. **Breast Cancer and Mantle Field Radiation**

- **Clinical Assessment Tool:** National Surgical Adjuvant Breast and Bowel Project (NSABP) and the National Cancer Institute (NCI) have developed a computer program to help women and their health care providers estimate the risk of developing breast cancer based on a number of risk factors. **Breast Cancer Risk Assessment Tool**

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Breast Cancer

Epidemiology

Morbidity and ***Mortality***

- It is estimated that 40,580 people will die of breast cancer in 2004. Published mortality rates for 2001 were 26 per 100,000 population across all age groups. Younger age groups had lower death rates, while older groups had higher rates. **2001 US Death Rates from Breast Cancer**

- The American Cancer Society reports that death rates from breast cancer in all races have declined in recent years. Between 1975 and 1990, death rates were increasing by 0.4% annually. However, between 1990 and 2000, mortality rates decreased by 2.3% annually. The decrease in death rates from 1990 to 2000 was more pronounced within younger age groups, with a decrease of 3.7% per year in women less than 50 years of age. This decline in mortality is attributed to increased breast cancer detection and improved breast cancer treatment.

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Breast Cancer

Epidemiology

Morbidity and ***Mortality*** **(continued—)**

- Several factors seem to influence survival rates of women diagnosed with breast cancer. These include; time since diagnosis, age at diagnosis, stage at diagnosis, and race/ethnicity/socioeconomic factors.
  - **Time Since Diagnosis:** Relative survival rates for women diagnosed with breast cancer are the following.
    - 87% at 5 years
    - 77% at 10 years
    - 63 % at 15years
    - 52% at 20 years

  For women who have already survived 5 years, the 5-year relative survival rate increases to 81% for white women and 76% for African American women. Five-year relative survival rates for women who have already survived 10 years increases to 87% and 85% for white and African American women, respectively.

  - **Age at Diagnosis:** Women over the age of 45 years have 5-year relative survival rates that increase with age. Women under the age of 45 have a lower rate, possibly due to more aggressive and less responsive tumors in this age group. The following are the 5-year relative survival rates based on age at diagnosis:

Age	5-Year Survival Rate
<45	83%
45-54	87%
55-64	88%
65-74	89%
75 or over	86%

- **Race/Ethnicity/Socioeconomic Factors:** Some disparity exists in death rates between whites, Hispanics, and African Americans. Between 1990 and 2000, the overall mortality rates declined for whites by 2.6% per year, while a 1.4% decline in deaths was seen in Hispanics and 1.1% decline in African American women. Five-year survival rates for African American women versus white women from 1995 to 2000 were 75.2% versus 88.9%, respectively. Even after adjustment for socioeconomic variables, this discrepancy still exists. Additionally, women with lower incomes are more likely to be diagnosed with an advanced stage of breast cancer and have a lower 5-year survival rates than women with higher incomes. These differences may be linked to unequal access to medical care, disparities in treatment, and the presence of comorbid conditions.

Race and Differences in Breast Cancer Survival in a Managed Care Population

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Breast Cancer

Epidemiology

Screening for Breast Cancer

Screening for breast cancer has been a controversial topic and the subject of various international and national studies and trials. Both the American Cancer Society and the U.S. Preventive Services Task Force (USPSTF) have put forth recommendations and criteria for the types of screening, age at screening onset, and frequency of screening. These recommendations are based on data supporting the reduction of breast cancer mortality with implementation of these screening methods. A summary of the screening trials, along with a critical appraisal of their methodologies, was published in the Annals of Internal Medicine.

Breast Cancer Screening: A Summary of the Evidence for the U.S. Preventive Services Task Force — Humphrey et al. 137 (5): 347 — Annals of Internal Medicine

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Breast Cancer

Epidemiology

Screening for Breast Cancer **(continued—)**

- **Breast Self-Exam (BSE):** The BSE is a screening modality that may be done by women over 20 years of age on their own breasts. However, in a limited number of trials, it has been demonstrated that mortality rates were similar regardless of whether women performed a monthly BSE or not. The American Cancer Society discontinued its recommendation in 2003 that women perform monthly BSE and has made the screening optional. The USPSTF does not recommend for or against teaching or performing routine BSE. However, numerous patient resources still advocate the use of BSE and advise women to perform this exam once a month, looking for breast lumps, asymmetry, and skin changes. If a patient wishes to perform monthly BSE, the clinician may instruct on the proper technique and changes to look for.

  Self Breast Exam

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BREAST Cancer

Epidemiology

Screening for Breast Cancer (continued—)

- **Clinical Breast Exam (CBE):** The CBE is performed by a trained health care professional. During this exam, the examiner performs a physical inspection of the breasts, looking for dimpling, asymmetry, skin changes or tethering. This is followed by palpation of the breast tissue, axilla, and supraclavicular lymph nodes. Sensitivity for this exam ranges from 40% to 69%, with a specificity of 88% to 99%. False positive results are higher among women younger than 50 years old, which may be due to increased breast density of these women. It has been demonstrated that CBE, in combination with mammography, decreases mortality rates. However, no screening trial has examined the benefits of CBE alone, without accompanying mammography, versus no screening.

Mammography Versus Clinical Examination of the Breasts

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Introduction

"Thanks in large part to the work of the USPTF, it is no longer questioned that appropriate preventive care belongs at the top of the list of effective interventions that must be available to all Americans. At a time when the leading causes of death are largely related to health-related behaviors – including tobacco use, poor diet, lack of physical activity, and alcohol use – it is particularly pertinent to highlight the importance of the health consequences of behavior. It remains extraordinarily important that physicians and other providers educate their patients about these matters."

GUIDE TO CLINICAL PREVENTIVE SERVICES, Second Edition
PHILIP R. LEE, M.D.
Assistant Secretary for Health
U.S. Department of Health and Human Services
Washington, DC

In July of 2000, Dr. David Satcher, the Surgeon General of the United States, declared a need for prevention education in the basic medical education curriculum[1]. The Liaison Committee on Medical Education (LCME) agreed with Dr. Satcher's recommendations, noting medical faculty's responsibility to create a curriculum that includes preventive medicine.

The value of prevention is increasingly being emphasized in medical educational institutions due to the growing prevalence and incidence of preventable diseases in the U.S. population. The **Preventive Medicine Electronic Curriculum's goals** are to provide up-to-date, clinically relevant information and cutting edge research results regarding the broad fields included under the rubric of Preventive Medicine.

In January of 2000, the U.S. Department of Health and Human Services released Healthy People 2010, a prevention agenda that identifies the

most significant preventable health threats and provides a road map toward improving health based on scientific knowledge and strategic management. This initiative has specific objectives in 28 focus areas with two overarching goals to increase the quality and years of healthy life and to eliminate Health Disparities.

The Guide to Clinical Preventive Services, Second edition was developed and published in 1996 by the U.S. Preventive Services Task Force (USPTF). The Guide was established to rigorously evaluate clinical research in order to provide science –based preventive recommendations for services including screening tests, counseling, immunizations, and chemoprevention. The mission of the task force served by the Guide is to 1. Evaluate the benefits of individual services, 2. Create age-, gender-, and risk-based recommendations about services that should routinely be incorporated into primary medical care, and 3. Identify a research agenda for clinical preventive care. This second edition includes more than 200 services offered in primary care.

These prevention resources provide the basis for clinical guidelines presented in this course as they present an ideal platform for launching a basic curriculum that includes the core competencies in health promotion and disease prevention set forth by the American Association of Teachers of Preventive Medicine. The course material is structured toward our main objectives to provide guidelines and information for incorporating clinical preventive services into medical practice. Clinical preventive services are relevant to all disciplines of medicine; however it is most effective at the primary level mainly served by family practice, internal medicine, ob-gyn, and pediatric services.

One exciting feature of this curriculum is that it provides the Preventive Medicine Vertical Theme of the CWRU medical school curriculum in an electronic format. See **course instructions** and **course requirements** for information on completing this course.

1. Satcher, D. **Academic Medicine. 2000;75(7):S1**

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CASE SCHOOL OF MEDICINE

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THE CHALLENGE:

Health professionals can prevent many of the leading causes of death by using the proper interventions. Despite sound clinical reasons for emphasizing prevention in medicine, studies have shown that clinicians often fail to provide recommended clinical services.

Guide to Clinical PREVENTIVE SERVICES, Second Edition
Report of the U.S. Preventive Services Task Force

Increase in the prevalence of behavior-related illnesses in the United States

- 18.2 million Americans with diabetes, and nearly one third unaware that they have the disease
- More than 64% of the U.S. adult population are overweight or obese
- Heart disease and stroke account for more than 40% of all deaths each year
- Cancer has now surpassed heart disease as the leading killer in this country, killing more than half a million people each year
- More than 65 million Americans have hypertension

From the Department of Health and Human Services, Healthy People 2010

"Future physicians will need to address new and emerging health issues, policies, technologies, and practice guidelines."

"Education programs need to be updated periodically to reflect the latest in the science of prevention."

"No medical professional should graduate from an accredited institution without a basic understanding of the principles of prevention."

"The link between individual medical care and treatment and population-based health care is essential if we are to provide the highest quality health care possible to the entire U.S. population."

David Satcher, MD, PhD ACADEMIC MEDICINE, Vol. 5, No. 7/July Supplement 2000

OUR RESPONSE...

CONTACT: KARLA HOLDEN, Elective Coordinator@case.edu , SOM REGISTRAR'S OFFICE, 216-368-3723

This elective is available to our students anywhere they can access the Internet.
https://ecurriculum.case.edu/YearFour/preventive_med/index.htm

NEW ONLINE ELECTIVE IN PREVENTIVE MEDICINE

Interactive Patient Scenarios
Interactive Game
Online Pre- and Post-Course Surveys
Online Post-Course Examination

COURSE GOALS AND OBJECTIVES...

- **Provides** students with baseline understanding of principles of prevention and health promotion.
- **Assists** students in reconciling conflicting recommendations and guidelines among expert organizations.
- **Describes** basic concepts in epidemiology as they relate to clinical prevention and health promotion, including risk factor assessment, risk stratification, and testing features (sensitivity, specificity, positive and negative predictive value).
- **Distinguishes** between primary, secondary and tertiary preventive services.
- **Identifies** and develops strategies that address patient, physician, and systems-level barriers to delivery of preventive care.
- **Encourages** students to apply and share knowledge gained through the development of an educational module about disease prevention and health promotion in an area of interest.
- **Provides** necessary tools and information for students to counsel patients effectively on general and condition-specific behavioral modification strategies.

STUDENT COMMENTS

- "I liked the convenience of distance learning. I could access it at 2:00 in the morning if I wanted to."
- "I don't remember any other course during medical school that has offered an integrated approach to prevention or preventive medicine. This course presents new material and its content is not replicated anywhere else in the medical school curriculum."
- "As I think back on other electives I have taken, the amount of additional knowledge I gained by taking this course was much greater."
- "I would definitely recommend this elective to other students."

Interactive Game

Maryrose Bauschka, M.D., Patricia Quallich, BFA, Thomas M. Nosek, Ph.D.,
Robert Haynie, M.D., Ph.D., and C. Kent Smith, M.D.

CONTACT: KARLA HOLDEN, Elective Coordinator@case.edu , SOM REGISTRAR'S OFFICE, 216-368-3723

- ***TWO WEEK COURSE*** requires studying the online information and taking the online exam to complete the elective. Those taking the two week option are not required to complete a

written module.

Online Exam: The online eExam can be taken at any point during the elective after the online material has been read. *You may access the exam as many times as you want since there is no time limit. Choose the submit button only when you are ready for evaluation.*

If more time is needed for the eExam, this is flexible, however **the exam has to be SUBMITTED BEFORE the end of the academic year on June 30th.** After the academic year ends, there will be no access to the online exam.

- ***FOUR WEEK COURSE*** requires studying the online information and taking the online exam to complete the elective with the option to develop a written module on prevention/ health promotion in an area of your interest - generally following the existing modules as a template for the format.

  NOTE: July 1, 2008 the written module will become a requirement. Anyone taking this elective after July 1st will be required to write a module.

  Some students prefer an interactive session in identifying and sketching out the educational module they create. If so, please feel free to contact Dr. Maryrose Bauschka, (216) 368-2212, mpb3@case.edu who will work to guide you through this process.

  Important notes:

  - Students who create a new written module can qualify for honors.
  - The online eExam can be taken at any point during the elective after the online material has been read. No need to wait until the written module has been finished). *You may access the exam as many times as you want since there is no time limit. Choose the submit button only when you are ready for evaluation.*

    If more time is needed for the eExam, this is flexible, however **the exam has to be SUBMITTED BEFORE the end of the academic year**. After the academic year ends, there will be no access to the online exam.

CONTACT INFORMATION

Notify: **Karla Holden,** SOM Registrar's Office (see below)
of your interest in the Preventive Medicine Type B Elective.

In order to receive course & exam information after registering, also please copy the email to **Patti Quallich**. & **Maryrose Bauschka, MD**.

Karla Holden
Elective Coordinator@case.edu
SOM Registrar's Office
(216) 368-3723
Room T408

Patti Quallich
pvq@case.edu
Office of Curricular Affairs
(216) 368-6617
Room E414

Maryrose Bauschka, MD
mpb3@case.edu
(216) 368-2212

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Course Registration:

Preventive Medicine & Health Promotion:

TYPE B ELECTIVE

COURSE #DGMS 0003

Notify: **Karla Holden**, SOM Registrar's Office (see below)
of your interest in the Preventive Medicine Type B Elective.
In order to receive course & exam information after registering,
also please copy the email to **Patti Quallich** and
Maryrose Bauschka, MD.

NOTE:
Please contact **Dr. Maryrose Bauschka**, *Director of Preventive Medicine & Health Promotion* for questions on this elective at mpb3@case.edu or call (216) 368-2212.

Karla Holden
Elective Coordinator@case.edu
SOM Registrar's Office
(216) 368-3723
Room T408

Maryrose Bauschka, MD
mpb3@case.edu
(216) 368-2212

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CONTACT US | 10900 Euclid Ave. | Cleveland, Ohio 44106 | preventionwebmaster@case.edu

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Please read the Course Instructions *carefully*.

*If you understand and agree to the course requirement, choose **I ACCEPT** (see below) which will take you directly to the **Pre-Course Survey**.*

*If you do NOT understand or accept the course requirements, please choose **I DO NOT ACCEPT** and **contact a** faculty member regarding your questions.*

You only need to choose I ACCEPT once.

In order to gain access to the surveys and exam from an off-campus location,

for the **user name** *entry you must use:* **SOM\user name**

Enter **password** *as usual.*

COURSE INSTRUCTIONS | COURSE REQUIREMENTS | ONLINE EXAM PROBLEMS

MODULE OUTLINE SUGGESTIONS | HOW TO CREATE A HYPERLINK | DEADLINES

MODULE TOPIC SUGGESTIONS IN CLINICAL AREAS

CONSENT AND WAIVER FORM

Course Instructions

1. COURSE MATERIALS

   All required reading materials are accessible online. Required readings are designated by  , and are linked to online source documents. Students may also review materials listed in the references section for the course; these materials can be made available upon request or through the Health Sciences Library.

2. REVIEW QUESTIONS

Review questions are placed within the chapters for your benefit. Please attempt these questions before moving on to the next section.

3. COURSE SURVEYS

   To evaluate this course, we need your comments and suggestions. Please complete and submit the pre and post-course surveys. Your answers to the survey will not affect your grade for the course.

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Course Requirements

In order to receive credit for the course the following requirements must be met:

*****Before beginning the course ALL students must contact a faculty member to discuss the following course requirements.**

1. All students must complete the **pre-course survey** before beginning the course.

2. In order to access the pre-course survey, please read the course instructions and if you agree to the terms of the course, then choose "I ACCEPT" at the end of this page. This will take you to the pre-course survey. If you do not accept the terms of the course, or if you have questions, please choose "I DO NOT ACCEPT" and contact a faculty member regarding your concerns. You only need to choose "I ACCEPT" once.

3. All students must complete the **eEXAM** upon completion of the course. IMPORTANT INFORMATION: **Use Internet Explorer on a Windows operating system while taking the eExam.**

4. Students may choose to contribute to the development of the curriculum in Preventive Medicine and Health Promotion through creation of an additional educational module in an area of interest. The topic of choice must be approved by one of the **faculty members** for the course. Students contributing to the course curriculum will be considered for honors credit.

   Students who choose to contribute to the curriculum must sign a **consent and waiver** in order for their materials to be added to the course. Please print and sign this consent and waiver form and take it to **Celena Townsend** in Student Affairs, Room E421.

5. All students must complete the **post-course survey** upon completion of the course. You may access the post-course survey through the link provided in the Frame of this web site.

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Online Exam Problems:

Contact Wei Wang or Patti Quallich if there are any technical issues regarding the online exam. See contact information below.

Wei Wang
wxw20@case.edu
Analyst / Programmer

Patti Quallich
pvq@case.edu
Course Elective Manager
Office of Curricular Affairs
(216) 368-6617
Room E414

Module Outline Suggestions

Here are some suggestions for what areas to cover in your module. These are suggestions and not meant to be a rigid guideline; you may add or delete topics to suit your module.

1) Introduction to Your Topic
2) Epidemiology, including:
    i) Prevalence
    ii) Incidence
    iii) Risk factors
    iv) Health Risks
    v) Morbidity and Mortality
    vi) Screening
    vii) Diagnosis
3) Co-morbid Conditions
4) Cost Burden
5) Prevention Programs Available
6) Lifestyle and Behavioral Modification
7) Primary Prevention

8) Secondary Prevention

9) Key Findings

Please provide references along with your module

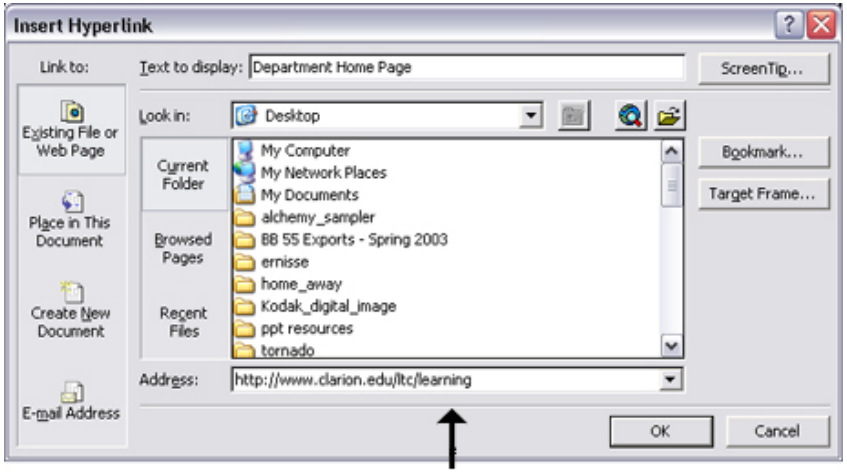
Please provide Pub Med links for all articles referenced in your module

TOP

How to Create a Hyperlink

As you are developing educational content or finding resources for your module, try to document reference materials – such as abstracts or informational websites. Once you find the abstract for your citation in PubMed or an interesting web resource:

1. Copy the web address you wish to link to.
2. In your Word document, select the text you wish to create a hyperlink to.
3. With the arrow on this text, right click on the mouse and choose "hyperlink" (or Cntrl + K).
4. Paste the web address into the address text box.
5. Choose "OK".



Paste web address here

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Deadlines

Topic selection due by the 8th (or the end of the first week)

Draft or Outline due by the 15th (or the end of the second week)

Final Module due by the 28th (or the end of the fourth week)

Please email your topic selections to **Dr. Maryrose Bauschka mpb3@case.edu**

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Module Topic Suggestions in Clinical Areas

- Cardiovascular Disease
- Diabetes
- Cancer
  - Lung
  - Colon
- Asthma
- Infectious Disease
  - HIV
  - STI's
- Substance Abuse
- Unintentional Injuries
- Obesity
  - Diet and Nutrition
  - Physical Activity
- Tobacco Prevention/Smoking Cessation

TOP

I have read the course instructions and I understand what is required for this course (this button will take you directly to the pre-course survey).

I ACCEPT

I have read the course instructions, but I still do NOT understand what is required for this course. (Please contact a faculty member to clarify your questions.)

I DO NOT ACCEPT

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Goals and Learning Objectives

Online Preventive Medicine and Health Promotion Elective

1. Provides students with baseline understanding of principles of prevention and health promotion and assists students in reconciling conflicting recommendations and guidelines among expert organizations.
2. Describes basic concepts in epidemiology as they relate to clinical prevention and health promotion, including risk factor assessment, risk stratification, and testing features (sensitivity, specificity, positive and negative predictive value).
3. Distinguishes between primary, secondary and tertiary preventive services.
4. Outlines gender and age-specific recommendations for disease prevention and health promotion.
5. Identifies and develops strategies that address patient, physician, and systems-level barriers to delivery of preventive care.
6. Identifies and assess the quality of resources for self and patient education on behavioral modification strategies.
7. Encourages students to apply and share knowledge gained through the development of an educational module about disease prevention and health promotion in an area of interest.
8. Helps students apply knowledge of prevention and health promotion in a broad range of settings.
9. Provides necessary tools and information for students to counsel patients effectively on general and condition-specific behavioral modification strategies.

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Glossary of Terms

This glossary is a compilation of several glossary sites available online. Definitions other than the ones referenced may be used in other contexts.
The sites used are listed below.

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Glossary Terms:

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| N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

25th Percentile 4

50th (median) Percentile 4

75th Percentile 4

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Age-adjusted Mortality Rate 6

Agent 6

Age-specific Mortality Rate 6

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Analytic (Explanatory) Study 2 6

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Mean, Geometric 6

Measure of Association 6

Measure of Central Location 6

Measure of Dispersion 6

Measurement Bias 2

Median 6

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Medical Surveillance 6

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Method of Concomitant Variations 1

Method of Difference 1

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Glossary Sites:

1. **Terminology Specific to Epidemiology**, Washington State University

   Clinical Study Designs and Methods Terminology, Washington State University

   Terminology Specific to Clinical Testing, Washington State University

   Experimental Design and Statistics Terminology, Washington State University

   Noncommunicable Disease Prevention and Health Promotion Glossary Site, World Health Organization

2. **Reproductive Health Glossary Site**, Centers for Disease Control and Prevention

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eExam Log In:

This exam is available for students registered
for this course elective.

IMPORTANT ISSUE FOR
ONLINE EXAM
When taking the eExam please note:

1. This application only works for Internet Explorer on a Windows operating system.
2. Click on the Save Answers button frequently and check your answers on the next page to make sure your answers are saved on the server.
3. You can log back on to the exam multiple times.
4. (It may be a good idea to copy your answers into a word document to ensure a backup in case your answers do not get saved.)

Students who are ready to take this exam,
click on the button below.

eEXAM

Online Exam Problems:

If you are unable to gain access to the course from an off campus location for your username enter:
SOM\[your user name] and then enter your password as usual.

EMAIL:

Patti Quallich
pvq@case.edu
Office of Curricular Affairs
(216) 368-4978
Room T402

C.C. EMAIL TO:

Wei Wang
wxw20@case.edu
Analyst / Programmer

CASE SCHOOL OF MEDICINE

Medical Education Survey

Preventive Medicine Post-Course Survey

12/16/2003 12:01:00 AM - 12/16/2010 12:01:00 AM

* You can log back on to the survey system multiple times to complete/modify your answers.

In responding to the following questions, please think about how you have felt over the past four weeks:

01. How effective do you think you are in changing your patients` behavior with respect to the following:

a. Exercise?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

b. Healty Diet?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

c. Weight Reduction?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

02. In general, how important do you think it is for physicians to counsel patients about the following:

a. Cholesterol?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

b. Blood Pressure?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

c. Exercise?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

d. Healthy Diet?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

e. Weight Reduction?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

03. What was the most useful aspect of this course?

04. What was the least useful aspect of this course?

05. What one thing would you recommend that would make this course better?

06. How likely would you be to recommend this course to someone else?

○ Very Likely ○ Somewhat Likely ○ Indifferent ○ Somewhat Unlikely ○ Very Unlikely

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Module 4 | Virtual Patient Scenarios

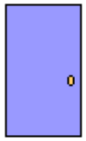
Module 4: Disease Prevention

Introduction:
From Module 4: Disease Prevention Introduction

In this module, you will learn about your patient's lives outside of the physician's office. Topics like childhood drownings and increasing physical activity should be addressed in the context of a patient's real life. For this reason, the interface for Module 4 is the townhouse complex where your patients live.

The practice of primary care medicine is a comprehensive endeavor that encompasses not only the identification and treatment of disease but the primary prevention of disease as well as the prevention of their secondary complications. In this module our patients will highlight several areas of preventive medicine that are commonly addressed by primary care physicians.

ENTER



Module 4
Community Primary Care Preceptorship

Virtual Patient Scenarios

This section includes some patient scenarios that address some of the main barriers to effective clinical preventive care.

These barriers are:

- Insufficient time
- Lack of knowledge of services offered for preventive care
- Lack of knowledge or skepticism about the effectiveness of services
- Different recommendations from multiple sources
- Inadequate reimbursement for counseling services
- Fragmentation of health care delivery
- Complications or adverse events of some prevention interventions, particularly when given to healthy individuals
- Economic implications - such as the cost or routing screening

As you read each scenario, try to formulate your own answers before viewing the answers provided. Don't assume that your ideas are incorrect if they do not match the answers provided. If you have any questions about this section, or about a particular scenario please email them to **Dr. David Litaker** at **wrightlit@aol.com**

These scenarios are provided for practice purposes only.

Cost Barriers System-Level

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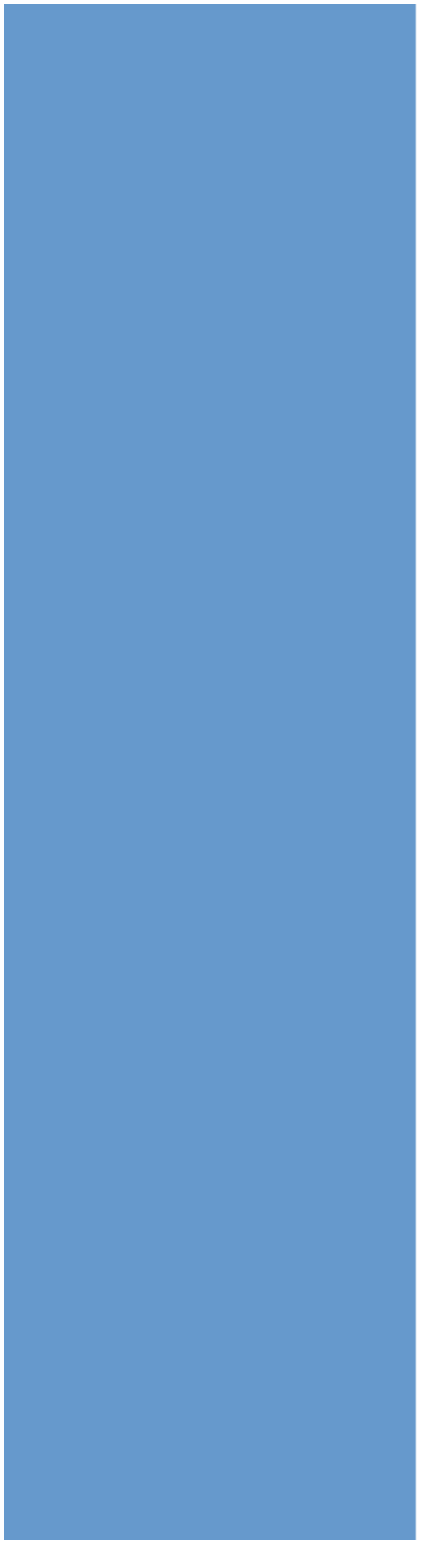
Clinician Resources:

- CARDIOVASCULAR DISEASE
- CANCER
- Children and Adolescents
- NUTRITION & EXERCISE
- DIABETES
- LUNG DISEASES
- HEALTH CARE FOR THE ELDERLY
- HYPERTENSION AND STROKE
- PREVENTION FOR MIGRANT/SEASONAL WORKERS
- PREVENTION FOR LATINOS
- WOMEN'S HEALTH
- OTHER PREVENTION SITES
- Interventions To Improve The Delivery Of Preventive Services



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CONTACT US | 10900 Euclid Ave. | Cleveland, Ohio 44106 | preventionwebmaster@case.edu

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Patient Resources:

- A Touch of Soul

Recipes lower in salt, fat, and cholesterol

- Nutrition and Exercise
- Heart Disease, Diabetes and Hypertension
- Cancer
- Children and Adolescents
- OTHER PREVENTION SITES

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You must have access to view the exam and survey results.

Faculty Exam Results:

GO TO EXAM

Instructions:

Choose:

1. Check Exam Performance for the academic year of your choice from the left frame drop down menu.
2. Then choose the student's name for the exam you need to check on the left.
3. Choose Print View button to see print view.
4. Choose File and then print.

Faculty Survey Results:

GO TO SURVEY

Instructions:

1. Choose:

"Standard Reports (IQR) or Standard Reports (SD) " from left menu frame

2. Various reports are displayed in middle frame.

3. Choose page numbers to view various reports and choose either the:
   Preventive Medicine Pre-Course Survey (page 4)
   Preventive Medicine Post-Course Survey (page 4)

4. View or print out the report

Preventive Medicine & Health Promotion: Fourth Year Elective

Introduction

"Thanks in large part to the work of the USPTF, it is no longer questioned that appropriate preventive care belongs at the top of the list of effective interventions that must be available to all Americans. At a time when the leading causes of death are largely related to health-related behaviors – including tobacco use, poor diet, lack of physical activity, and alcohol use – it is particularly pertinent to highlight the importance of the health consequences of behavior. It remains extraordinarily important that physicians and other providers educate their patients about these matters."

GUIDE TO CLINICAL PREVENTIVE SERVICES, Second Edition
PHILIP R. LEE, M.D.
Assistant Secretary for Health
U.S. Department of Health and Human Services
Washington, DC

In July of 2000, Dr. David Satcher, the Surgeon General of the United States, declared a need for prevention education in the basic medical education curriculum[1]. The Liaison Committee on Medical Education (LCME) agreed with Dr. Satcher's recommendations, noting medical faculty's responsibility to create a curriculum that includes preventive medicine.

The value of prevention is increasingly being emphasized in medical educational institutions due to the growing prevalence and incidence of preventable diseases in the U.S. population. The **Preventive Medicine Electronic Curriculum's goals** are to provide up-to-date, clinically relevant information and cutting edge research results regarding the broad fields included under the rubric of Preventive Medicine.

In January of 2000, the U.S. Department of Health and Human Services released Healthy People 2010, a prevention agenda that identifies the most significant preventable health threats and provides a road map toward improving health based on scientific knowledge and strategic management. This initiative has specific objectives in 28 focus areas with two overarching goals to increase the quality and years of healthy life and to eliminate Health Disparities.

The Guide to Clinical Preventive Services, Second edition was developed and published in 1996 by the U.S. Preventive Services Task Force (USPTF). The Guide was established to rigorously evaluate clinical research in order to provide science –based preventive recommendations for services including screening tests, counseling, immunizations, and chemoprevention. The mission of the task force served by the Guide is to 1. Evaluate the benefits of

individual services, 2. Create age-, gender-, and risk-based recommendations about services that should routinely be incorporated into primary medical care, and 3. Identify a research agenda for clinical preventive care. This second edition includes more than 200 services offered in primary care.

These prevention resources provide the basis for clinical guidelines presented in this course as they present an ideal platform for launching a basic curriculum that includes the core competencies in health promotion and disease prevention set forth by the American Association of Teachers of Preventive Medicine. The course material is structured toward our main objectives to provide guidelines and information for incorporating clinical preventive services into medical practice. Clinical preventive services are relevant to all disciplines of medicine; however it is most effective at the primary level mainly served by family practice, internal medicine, ob-gyn, and pediatric services.

One exciting feature of this curriculum is that it provides the Preventive Medicine Vertical Theme of the CWRU medical school curriculum in an electronic format. See **course instructions** and **course requirements** for information on completing this course.

1. Satcher, D. **Academic Medicine. 2000;75(7):S1**

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Faculty Contact List

DIRECTOR, PREVENTIVE MEDICINE ELECTIVE

Maryrose Bauschka, M.D.
Director, Preventive Medicine & Health Promotion
(216) 368-2212
mpb3@case.edu

Patti Quallich
Preventive Medicine & Health Promotion
Webmaster and Course Manager
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pvq@case.edu

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Goals and Learning Objectives

Online Preventive Medicine and Health Promotion Elective

1. Provides students with baseline understanding of principles of prevention and health promotion and assists students in reconciling conflicting recommendations and guidelines among expert organizations.
2. Describes basic concepts in epidemiology as they relate to clinical prevention and health promotion, including risk factor assessment, risk stratification, and testing features (sensitivity, specificity, positive and negative predictive value).
3. Distinguishes between primary, secondary and tertiary preventive services.
4. Outlines gender and age-specific recommendations for disease prevention and health promotion.
5. Identifies and develops strategies that address patient, physician, and systems-level barriers to delivery of preventive care.
6. Identifies and assess the quality of resources for self and patient education on behavioral modification strategies.
7. Encourages students to apply and share knowledge gained through the development of an educational module about disease prevention and health promotion in an area of interest.
8. Helps students apply knowledge of prevention and health promotion in a broad range of settings.
9. Provides necessary tools and information for students to counsel patients effectively on general and condition-specific behavioral modification strategies.

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Preventive Medicine & Health Promotion: Fourth Year Elective

Course Information:

TYPE B ELECTIVE • **COURSE #DGMS 0003**

2 WEEK COURSE | **4 WEEK COURSE**

REGISTRATION CONTACT INFORMATION

NOTE:
Please contact **Dr. Maryrose Bauschka**,
Director of Preventive Medicine & Health Promotion
for questions on this elective at
mpb3@case.edu or call (216) 368-2212.

NEW ONLINE TYPE B ELECTIVE
COURSE #DGMS0003

CASE SCHOOL OF MEDICINE

BIT

THE CHALLENGE:

Health professionals can prevent many of the leading causes of death by using the proper interventions. Despite sound clinical reasons for emphasizing prevention in medicine, studies have shown that clinicians often fail to provide recommended clinical services.

Guide to Clinical PREVENTIVE SERVICES, Second Edition
Report of the U.S. Preventive Services Task Force

Increase in the prevalence of behavior-related illnesses in the United States

- 18.2 million Americans with diabetes, and nearly one third unaware that they have the disease
- More than 64% of the U.S. adult population are overweight or obese
- Heart disease and stroke account for more than 40% of all deaths each year
- Cancer has now surpassed heart disease as the leading killer in this country, killing more than half a million people each year
- More than 65 million Americans have hypertension

From the Department of Health and Human Services, Healthy People 2010

"Future physicians will need to address new and emerging health issues, policies, technologies, and practice guidelines."

"Education programs need to be updated periodically to reflect the latest in the science of prevention."

"No medical professional should graduate from an accredited institution without a basic understanding of the principles of prevention."

"The link between individual medical care and treatment and population-based health care is essential if we are to provide the highest quality health care possible to the entire U.S. population."

health care is essential if we are to provide the highest quality health care possible to the entire U.S. population."

David Satcher, MD, PhD ACADEMIC MEDICINE, Vol. 5, No. 7/July Supplement 2000

OUR RESPONSE...

CONTACT: KARLA HOLDEN, krh33@case.edu, SOM REGISTRAR'S OFFICE, 216-368-6137

This elective is available to our students anywhere they can access the Internet.
https://ecurriculum.case.edu/YearFour/preventive_med/index.htm

NEW ONLINE ELECTIVE IN PREVENTIVE MEDICINE

Interactive Patient Scenarios

Interactive Game

Online Pre- and Post-Course Surveys

Online Post-Course Examination

COURSE GOALS AND OBJECTIVES...

- **Provides** students with baseline understanding of principles of prevention and health promotion.
- **Assists** students in reconciling conflicting recommendations and guidelines among expert organizations.
- **Describes** basic concepts in epidemiology as they relate to clinical prevention and health promotion, including risk factor assessment, risk stratification, and testing features (sensitivity, specificity, positive and negative predictive value).
- **Distinguishes** between primary, secondary and tertiary preventive services.
- **Identifies** and develops strategies that address patient, physician, and systems-level barriers to delivery of preventive care.
- **Encourages** students to apply and share knowledge gained through the development of an educational module about disease prevention and health promotion in an area of interest.
- **Provides** necessary tools and information for students to counsel patients effectively on general and condition-specific behavioral modification strategies.

STUDENT COMMENTS

- "I liked the convenience of distance learning. I could access it at 2:00 in the morning if I wanted to."
- "I don't remember any other course during medical school that has offered an integrated approach to prevention or preventive medicine. This course presents new material and its content is not replicated anywhere else in the medical school curriculum."
- "As I think back on other electives I have taken, the amount of additional knowledge I gained by taking this course was much greater."
- "I would definitely recommend this elective to other students."

Interactive Game

Maryrose Bauschka, M.D., Patricia Quallich, BFA, Thomas M. Nosek, Ph.D., Robert Haynie, M.D., Ph.D., and C. Kent Smith, M.D.

CONTACT: KARLA HOLDEN, krh33@case.edu, SOM REGISTRAR'S OFFICE, 216-368-6137

- **TWO WEEK COURSE** requires studying the online information and taking the online exam to complete the elective. Those taking the two week option are not required to complete a written module.

Online Exam: The online eExam can be taken at any point during the elective after the online material has been read. If more time is needed for the eExam, this is flexible, however **the exam has to be SUBMITTED BEFORE the end of the academic year**. After the academic year ends, there will be no access to the online exam.

- **FOUR WEEK COURSE** requires studying the online information and taking the online exam to complete the elective with the option to develop a written module on prevention/health promotion in an area of your interest - generally following the existing modules as a template for the format.

  NOTE: July 1, 2008 the written module will become a requirement. Anyone taking this elective after July 1st will be required to write a module.

  Some students prefer an interactive session in identifying and sketching out the educational module they create. If so, please feel free to contact Dr. Maryrose Bauschka, (216) 368-2212, mpb3@case.edu who will work to guide you through this process.

  Important notes:

  - Students who create a new written module can qualify for honors.
  - The online eExam can be taken at any point during the elective after the online material has been read. No need to wait until the written module has been finished). If more time is needed for the eExam, this is flexible, however **the exam has to be SUBMITTED BEFORE the end of the academic year**. After the academic year ends, there will be no access to the online exam.

CONTACT INFORMATION

Notify: **Karla Holden,** SOM Registrar's Office (see below)
of your interest in the Preventive Medicine Type B Elective.

In order to receive course & exam information after registering, also please copy the email to **Patti Quallich**. & **Maryrose Bauschka, MD**.

EMAIL:

Karla Holden
krh33@case.edu
SOM Registrar's Office
(216) 368-6137
Room T408

C.C. EMAIL TO:

Patti Quallich
pvq@case.edu
Office of Curricular Affairs
(216) 368-6617
Room E414

Maryrose Bauschka, MD
mpb3@case.edu
(216) 368-2212

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Preventive Medicine & Health Promotion: Fourth Year Elective

COURSE REGISTRATION | ONLINE EXAM PROBLEMS

Course Registration:

Preventive Medicine & Health Promotion:

TYPE B ELECTIVE

COURSE #DGMS 0003

Notify: **Karla Holden**, SOM Registrar's Office (see below)
of your interest in the Preventive Medicine Type B Elective.
In order to receive course & exam information after registering, also please copy the email to **Patti Quallich** & **Maryrose Bauschka, MD**.

NOTE:
Please contact **Dr. Maryrose Bauschka**, *Director of Preventive Medicine & Health Promotion* for questions on this elective at mpb3@case.edu or call (216) 368-2212.

EMAIL:

Karla Holden
krh33@case.edu
SOM Registrar's Office
(216) 368-6137
Room T408

C.C. EMAIL TO:

Maryrose Bauschka, MD
mpb3@case.edu
(216) 368-2212

Patti Quallich
pvq@case.edu
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Online Exam Problems:

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Wei Wang
wxw20@case.edu
Analyst / Programmer

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Please read the Course Instructions *carefully*.

*If you understand and agree to the course requirement, choose **I ACCEPT** (see below) which will take you directly to the **Pre-Course Survey**.*

*If you do NOT understand or accept the course requirements, please choose **I DO NOT ACCEPT** and **contact a** faculty member regarding your questions.*

You only need to choose I ACCEPT once.

In order to gain access to the surveys and exam from an off-campus location,

for the **user name** *entry you must use:* **SOM\user name**

Enter **password** *as usual.*

Course Instructions | Course Requirements

Module Outline Suggestions | How to Create a Hyperlink | Deadlines

Module Topic Suggestions in Clinical Areas

Consent and Waiver Form

Course Instructions

1. COURSE MATERIALS

   All required reading materials are accessible online. Required readings are designated by  , and are linked to online source documents. Students may also review materials listed in the references section for the course; these materials can be made available upon request or through the Health Sciences Library.

2. REVIEW QUESTIONS

   Review questions are placed within the chapters for your benefit. Please attempt these questions before moving on to the next section.

3. COURSE SURVEYS

   To evaluate this course, we need your comments and suggestions. Please complete and submit the pre and post-course surveys. Your answers to the survey will not affect your grade for the course.

TOP

Course Requirements

In order to receive credit for the course the following requirements must be met:

***Before beginning the course ALL students must contact a faculty

member to discuss the following course requirements.

1. All students must complete the **pre-course survey** before beginning the course.

2. In order to access the pre-course survey, please read the course instructions and if you agree to the terms of the course, then choose "I ACCEPT" at the end of this page. This will take you to the pre-course survey. If you do not accept the terms of the course, or if you have questions, please choose "I DO NOT ACCEPT" and contact a faculty member regarding your concerns. You only need to choose "I ACCEPT" once.

3. All students must complete the **eEXAM** upon completion of the course. IMPORTANT INFORMATION: **Use Internet Explorer on a Windows operating system while taking the eExam.**

4. Students may choose to contribute to the development of the curriculum in Preventive Medicine and Health Promotion through creation of an additional educational module in an area of interest. The topic of choice must be approved by one of the **faculty members** for the course. Students contributing to the course curriculum will be considered for honors credit.

   Students who choose to contribute to the curriculum must sign a **consent and waiver** in order for their materials to be added to the course. Please print and sign this consent and waiver form and take it to **Celena Townsend** in Student Affairs, Room E421.

5. All students must complete the **post-course survey** upon completion of the course. You may access the post-course survey through the link provided in the Frame of this web site.

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Module Outline Suggestions

Here are some suggestions for what areas to cover in your module. These are suggestions and not meant to be a rigid guideline; you may add or delete topics to suit your module.

1) Introduction to Your Topic

2) Epidemiology, including:

   i) Prevalence

   ii) Incidence

   iii) Risk factors

   iv) Health Risks

   v) Morbidity and Mortality

   vi) Screening

   vii) Diagnosis

3) Co-morbid Conditions

4) Cost Burden

5) Prevention Programs Available

6) Lifestyle and Behavioral Modification

7) Primary Prevention

8) Secondary Prevention

9) Key Findings

Please provide references along with your module

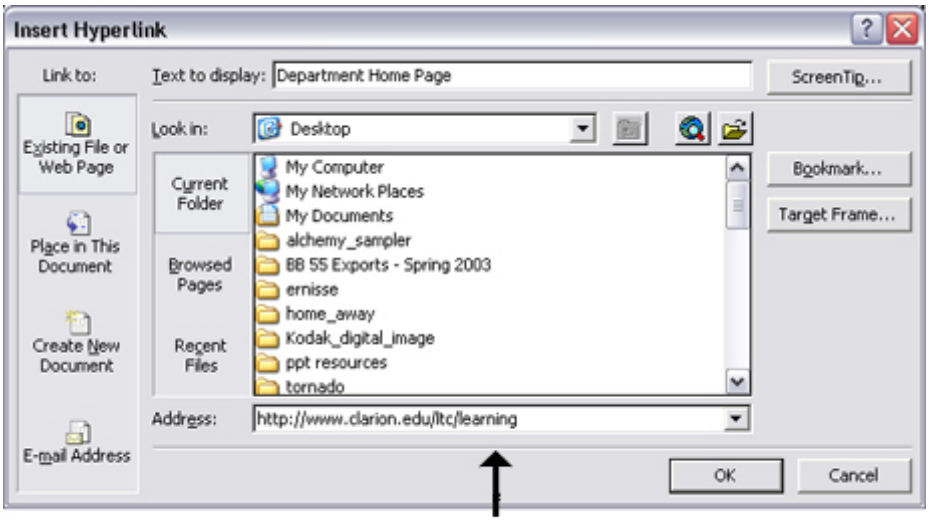
Please provide Pub Med links for all articles referenced in your module

TOP

How to Create a Hyperlink

As you are developing educational content or finding resources for your module, try to document reference materials – such as abstracts or informational websites. Once you find the abstract for your citation in PubMed or an interesting web resource:

1. Copy the web address you wish to link to.
2. In your Word document, select the text you wish to create a hyperlink to.
3. With the arrow on this text, right click on the mouse and choose "hyperlink" (or Cntrl + K).
4. Paste the web address into the address text box.
5. Choose "OK".



Paste web address here

TOP

Deadlines

Topic selection	due by the 8th	(or the end of the first week)
Draft or Outline	due by the 15th	(or the end of the second week)
Final Module	due by the 28th	(or the end of the fourth week)

Please email your topic selections to **Dr. Maryrose Bauschka mpb3@case.edu**

TOP

Module Topic Suggestions in Clinical Areas

- Cardiovascular Disease
- Diabetes
- Cancer
  - Lung
  - Colon
- Asthma
- Infectious Disease
  - HIV
  - STI's
- Substance Abuse
- Unintentional Injuries
- Obesity
  - Diet and Nutrition
  - Physical Activity
- Tobacco Prevention/Smoking Cessation

TOP

I have read the course instructions and I understand what is required for this course (this button will take you directly to the pre-course survey).

I ACCEPT

I have read the course instructions, but I still do NOT understand what is required for this course. (Please contact a faculty member to clarify your questions.)

I DO NOT ACCEPT

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Chapters

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Glossary of Terms

This glossary is a compilation of several glossary sites available online. Definitions other than the ones referenced may be used in other contexts. The sites used are listed below.

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25th Percentile 4

50th (median) Percentile 4

75th Percentile 4

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Attack Rate 1 6

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Mean, Geometric 6

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Measure of Central Location 6

Measure of Dispersion 6

Measurement Bias 2

Median 6

Mediation, p26 5

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Method of Concomitant Variations 1

Method of Difference 1

Method of Residues 1

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Mill's Eliminative Methods of Induction (System of Logic, 1843) 1

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Box Plot (Box-and-Whisker Plot) 4 6

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Ecological (Aggregation) Bias (Fallacy) 2

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Enabling, p17 5

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Epidemic Period 6

Epidemiologic Triad 6

Epidemiology, p17 5, 6

Equity in Health, p17 5

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Etiologic Fraction: (Population attributable risk) 1

Etiology 1

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Evan's Postulates (1976) 1

Exposed (group) 6

Experimental Studies 2 6

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Glossary Sites:

1. **Terminology Specific to Epidemiology**, Washington State University

   Clinical Study Designs and Methods Terminology, Washington State University

   Terminology Specific to Clinical Testing, Washington State University

   Experimental Design and Statistics Terminology, Washington State University

   Noncommunicable Disease Prevention and Health Promotion Glossary Site, World Health Organization

2. **Reproductive Health Glossary Site**, Centers for Disease Control and Prevention

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Preventive Medicine & Health Promotion: Fourth Year Elective

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eExam Log In:

This exam is available for students registered for this course elective.

IMPORTANT ISSUE FOR
ONLINE EXAM
When taking the eExam please note:

1. This application only works for **Internet Explorer** on a Windows operating system.
2. Click on the **Save Answers button** frequently and check your answers on the next page to make sure your answers are saved on the server.
3. You can log back on to the exam **multiple times**.
4. (It may be a good idea to **copy your answers into a word document** to ensure a backup in case your answers do not get saved.)

Students who are ready to take this exam, click on the button below.

eEXAM

Online Exam Problems:

If you are unable to gain access to the course from an off campus location
for your username enter:
SOM\[your user name] and then enter your password as usual.

EMAIL:

C.C. EMAIL TO:

Patti Quallich
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Room T402

Wei Wang
wxw20@case.edu
Analyst / Programmer

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CASE SCHOOL OF MEDICINE

Medical Education Survey

Preventive Medicine Post-Course Survey

12/16/2003 12:01:00 AM - 12/16/2010 12:01:00 AM

* You can log back on to the survey system multiple times to complete/modify your answers.

In responding to the following questions, please think about how you have felt over the past four weeks:

01. How effective do you think you are in changing your patients` behavior with respect to the following:

a. Exercise?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

b. Healty Diet?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

c. Weight Reduction?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

02. In general, how important do you think it is for physicians to counsel patients about the following:

a. Cholesterol?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

b. Blood Pressure?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

c. Exercise?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

d. Healthy Diet?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

e. Weight Reduction?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

03. What was the most useful aspect of this course?

04. What was the least useful aspect of this course?

05. What one thing would you recommend that would make this course better?

06. How likely would you be to recommend this course to someone else?

○ Very Likely ○ Somewhat Likely ○ Indifferent ○ Somewhat Unlikely ○ Very Unlikely

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Interest Group Opportunities

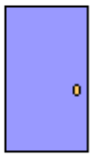
Module 4: Disease Prevention

Introduction:
From Module 4: Disease Prevention Introduction

In this module, you will learn about your patient's lives outside of the physician's office. Topics like childhood drownings and increasing physical activity should be addressed in the context of a patient's real life. For this reason, the interface for Module 4 is the townhouse complex where your patients live.

The practice of primary care medicine is a comprehensive endeavor that encompasses not only the identification and treatment of disease but the primary prevention of disease as well as the prevention of their secondary complications. In this module our patients will highlight several areas of preventive medicine that are commonly addressed by primary care physicians.

ENTER



Module 4
Community Primary Care Preceptorship

Virtual Patient Scenarios

This section includes some patient scenarios that address some of the main barriers to effective clinical preventive care.

These barriers are:

- Insufficient time
- Lack of knowledge of services offered for preventive care
- Lack of knowledge or skepticism about the effectiveness of services
- Different recommendations from multiple sources
- Inadequate reimbursement for counseling services
- Fragmentation of health care delivery

- Complications or adverse events of some prevention interventions, particularly when given to healthy individuals
- Economic implications - such as the cost or routing screening

As you read each scenario, try to formulate your own answers before viewing the answers provided. Don't assume that your ideas are incorrect if they do not match the answers provided. If you have any questions about this section, or about a particular scenario please email them to **Dr. David Litaker** at **wrightlit@aol.com**

These scenarios are provided for practice purposes only.

Cost Barriers System-Level

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Clinician Resources:

- CARDIOVASCULAR DISEASE
- CANCER
- Children and Adolescents
- NUTRITION & EXERCISE
- DIABETES
- LUNG DISEASES
- HEALTH CARE FOR THE ELDERLY
- HYPERTENSION AND STROKE
- PREVENTION FOR MIGRANT/SEASONAL WORKERS
- PREVENTION FOR LATINOS
- WOMEN'S HEALTH
- OTHER PREVENTION SITES
- Interventions To Improve The Delivery Of Preventive Services

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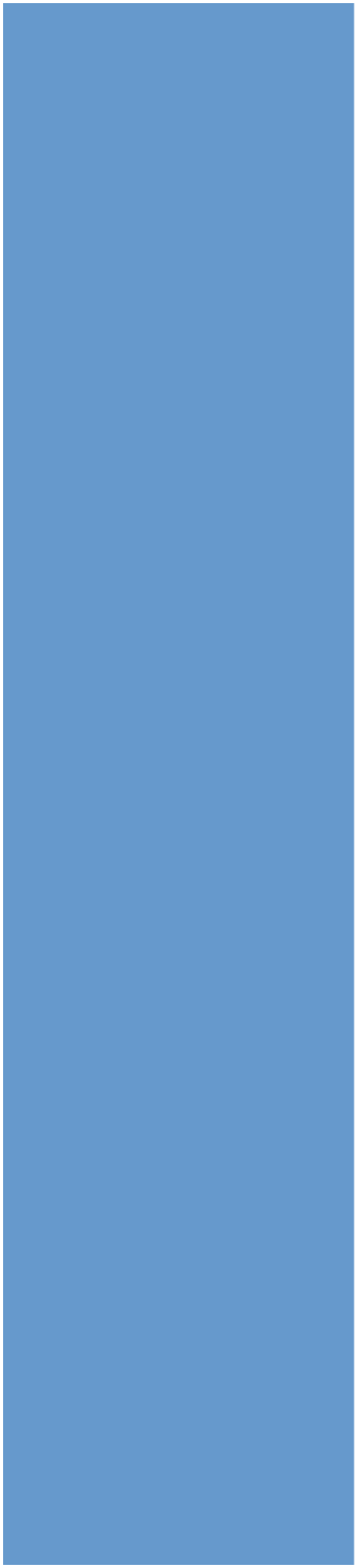

Chapters

Prevention Website PDF

Patient Resources:

- A Touch of Soul

Recipes lower in salt, fat, and cholesterol

- Nutrition and Exercise
- Heart Disease, Diabetes and Hypertension
- Cancer
- Children and Adolescents
- OTHER PREVENTION SITES

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Student Resources and Updates

News

New modules have been added to the course!!!

CVD Module 1:	**Women's Cardiovascular Health**	by Anupama Rao, MD	2004-05
INF DIS Module 1:	**Childhood Immunizations**	by Karen Goda, R.N.	2004-05
CANCER Module 1:	**Breast Cancer**	by Ann Rivera, MD	2005-06
PREV Module 2:	**Obesity Prevention**	by Dawn Wiese, MD	2006-07
NEURO DIS Module 1:	**Cerebral Aneurysms**	by Jason Hill	2007-08

Resources

Does Preventive Care Save Money? Health Economics and the Presidential Candidates - J. T. Cohen, P. J. Neumann, and M. C. Weinstein
website: "The New England Journal of Medicine"
Volume 358 — February 14, 2008 — Number 7
Extract | FREE Full Text | PDF | Supplementary Material

U.S. Preventive Services Task Force (USPSTF) - website: UHRQ Agency for Healthcare Research and Quality, 2007

Preventive Care: A National Profile on Use, Disparities, and Health Benefits - website: Partnership for Prevention, Shaping Policies, Improving Health / August 2007

Preventive Health-Care Practices Could Avert 100,000 Deaths each Year - website: Health Memphis Common Table / ABC World News

Preventive Health Examinations and Preventive Gynecological Examinations in the United States - website: Rand Health, Sept. 2007

Genetics & Preventive Care - website: Wonca, Global Family Doctor, Dec. 2007

Healthy People 2010 - website: Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Serves, Dec. 2007

Preventive Medicine: Giving Patients the Hard Sell. Your patients will be better off if you take a more active approach and consistently advocate for prevention. Linwood W. Watson, MD - website: American Academy of Family Physicians: News & Publications

At Your Request...

- We have added a comprehensive list of chapter readings at the beginning of each chapter.

PREVENTION CHAPTER READINGS

HYPERTENSION CHAPTER READINGS

- A PDF of the Preventive Medicine website has been added to the left menu so you can save it to your desktop.

Course Reviews

"Are you interested in Prevention Medicine? I just completed this awesome, new elective sponsored by Drs. Smith, Haynie and Litaker. It's completely online, yes 24 hr access, has very well written chapters, plenty of references and evidence based. Since we don't have a formal Prevention module, I found this to be extremely helpful in gluing concepts together for a more comprehensive understanding and therefore a more effective approach in counseling patients. Plus there are many opportunities to show your stuff; developing patient scenarios, researching a specific interest, even creating your own trials, the sky is the limit. We want to hear your ideas. Feel free to contact me or Drs. Smith or Haynie for more info. Check it out!!" Hopefully this is what you had in mind. Please contact me if you need anything else.
- **Mary Larkin Robin**, mrl10@case.edu

The references thus far have been outstanding! These studies are landmark and are referenced throughout the third year. It would be ideal if students in the third year had access to these links so that they can speak intelligently about these studies while on the wards (i.e. ALLHAT, AASK) etc.
- **Aja Smith**, ajassmith@yahoo.com

For those of you who are planning out your fourth year, I wanted to let you know about a great new elective I just finished taking. This is a 4-week online course in Preventive Medicine with Drs Litaker, Smith and Nosek that explores a number of ways in which to incorporate evidence-based prevention into clinical practice. There is also the opportunity to participate in designing part of the curriculum with topics of your own interest. On an added note, I thought this was an ideal option for me as it was completely online and could be accessed from any location.
- **Anupama Rao**, akr6@case.edu

I honestly learned a lot and I think it was a really worthwhile elective. Thanks again.
- **Megan Testa**, mtg13@cwru.edu

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Preventive Medicine & Health Promotion: Fourth Year Elective

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Prevention Website PDF

BACK

You must have access to view the exam and survey results.

Faculty Exam Results:

GO TO EXAM

Instructions:

Choose:

1. Check Exam Performance for the academic year of your choice from the left frame drop down menu.
2. Then choose the student's name for the exam you need to check on the left.
3. Choose Print View button to see print view.
4. Choose File and then print.

Faculty Survey Results:

GO TO SURVEY

Instructions:

1. Choose:
   "Standard Reports (IQR) or Standard Reports (SD) " from left menu frame
2. Various reports are displayed in middle frame.
3. Choose page numbers to view various reports and choose either the:
   Preventive Medicine Pre-Course Survey (page 4)
   Preventive Medicine Post-Course Survey (page 4)
4. View or print out the report

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Chapters

Prevention Website PDF

AMSA Interest Groups:

AMSA Opportunities

1. **New Preventive Medicine Specialty Forum**

A new Specialty Forum was created at the National Convention this year; Preventive Medicine is the newest AMSA SF group. AMSA Interest Groups (IGs) are collections of AMSA members who share a similar interest and Specialty Forums were created to denote IGs with an academic focus.

We're looking for motivated students interested in preventive medicine. If you would like to get involved on the ground floor, join the listserve or possibly serve in a leadership position for the Preventive Medicine Specialty Forum.

Visit the AMSA Web site at http://www.amsa.org/about/ig.cfm or contact the *Director of Student Programming* at dsp@amsa.org or call 1 (800) 767-2266, ext. 270.

Other Opportunities

1. **American Holistic Medical Association 2008 Art & Science of Health Promotion Conference.**
   "Maximizing ROI in Health Promotion: Improving Health, Reducing Costs"

   Intensive Training Seminars:
   March 3-4 and **March 8, 2008**
   San Diego Convention Center| San Diego, CA

   Online Registration Form:
   register before February 28, 2008 for discounted fee.

   Visit the **AHMA website** today for complete details!

2. **Boston University Summer Institute in Geriatric Medicine:**
   www.bmc.org/geriatrics/educationMedicalStudents_SIGM.htm

3. **The American Foundation for Suicide Prevention** -
   contains award information & description of AFSP research grants.
   http://www.americangeriatrics.org/funding/sig_funding.shtml#afsp

   Application:
   Deadline: December 15, 2007 and June 15, 2008.

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Lippincott Williams & Wilkins | Ovid | Adis

Error 404: Page Not Found

Hi! Unfortunately, we couldn't find the page you tried to view.

It is possible that the link you followed to get here was invalid, or out of date.

Here's a list of links that would be of interest

-
- www.lwwonline.com
- www.wkhealth.com
- www.lww.com

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SEARCH CaseMED:

SEARCH

Charles Kent Smith, M.D.

In 1995, Charles Kent Smith, M.D., was made the acting vice dean at the Case Western Reserve University (CWRU) School of Medicine. He oversees the school's academic programs. He is also the Dorothy Jones Weatherhead Professor and chairman of the Department of Family Medicine at CWRU. He directs the Department of Family Medicine at University Hospitals of Cleveland (UHC), CWRU's primary affiliated hospital. He was appointed chairman and director in 1988.

Before joining CWRU and UHC, he was professor and chairman of the Department of Family and Community Medicine at the Eastern Virginia Medical School, Norfolk, Virginia. He held these positions for three years beginning in 1985. From 1977 until 1985, he was vice chairman in the Department of Family Medicine at the University of Washington School of Medicine in Seattle. In 1981, he was appointed professor of family medicine.

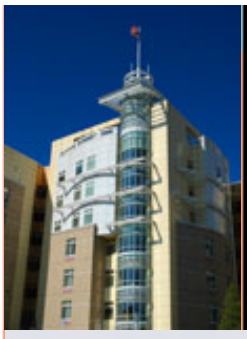
Dr. Smith earned his medical degree from Northwestern University Medical School in Chicago in 1963. A year later, he earned a masters from Northwestern in Evanston, Illinois. His undergraduate degree is from the same school.

His postgraduate training took him to University Hospital in Ann Arbor, Michigan, and University Hospital at the University of Washington, Seattle. He was a senior research fellow in medicine (endocrinology) from 1968-1970 at that hospital.

Dr. Smith has the following board certifications: 1974 - American Board of Family Practice, recertified 1981, 1987, 1993; 1974 - Eligible American Board of Psychiatry; 1970 - American Board of Internal Medicine; 1993 - ACLS Certified.

He was named in the book "The Best Doctors in America: Midwest Region, 1996-1997"; one of the "Top Doctors" in the March 1996 issue of Cleveland magazine; and in 1995, President-Elect, Association of Departments of Family Medicine (Family Medicine Department Chairs).

CASE
CASE WESTERN RESERVE UNIVERSITY



PHYSIOLOGY & BIOPHYSICS
AT CASE SCHOOL OF MEDICINE

Thomas Nosek
Professor

View Curriculum Vitae

Ph.D., The Ohio State University, 1973

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RELATED RESEARCH AREAS

Cell Biology

Systems	Diseases
Muscle	

Systems Integrated Physiology

Systems	Diseases
Muscle	Cardiovascular Disease

RESEARCH INTERESTS

Muscle fatigue results from changes in the intracellular milieu that cause both a decrease in calcium release from the sarcoplasmic reticulum (SR) and the force producing capabilities of the contractile proteins (CP) caused by reactive oxygen species. Under physiologic conditions, muscles become hypoxic during the course of fatiguing stimulation. When we mimic these physiologic hypoxic-fatiguing conditions, long term damage to the CP is greatest in EDL, least in soleus, and intermediate in diaphragm muscle. We found that hypoxic fatigue causes specific fragmentation of TnT in EDL but not in soleus. This TnT fragmentation is of three classes; one that appears to have no functional impact, one which may influence qualitative contractile properties, and one which may reflect quantitative loss of contractile units. EDL is made up of only fast-twitch fibers while soleus is made up of slow, fast, and mixed fibers. We believe the relative protection of soleus muscle from the damaging effects of

hypoxic fatigue is due to the relatively small percentage of fast-twitch fibers in these control muscles.

We have found that damage to the functional properties of the CP of soleus, but not EDL, muscles in response to fatiguing stimulation is exacerbated by hind limb suspension (mimicking inactivity and characterized by fiber type-specific troponin isoform switching from slow to fast) and ameliorated by voluntary wheel running (a natural and self-regulated form of exercise) and in vivo treatment with free radical scavengers. Therefore, we are testing the following hypothesis: 1) long-lasting damage by hypoxic fatigue to the contractility of fast-twitch muscle fibers is due to proteolytic damage to TnT; 2) the level of activity (ranging from inactivity to routine vigorous exercise) of soleus muscle effectively influences the degree of long-term damage by hypoxic fatigue by shifting the fast/slow twitch fiber ratio.

View Thomas Nosek's Publications on PubMed

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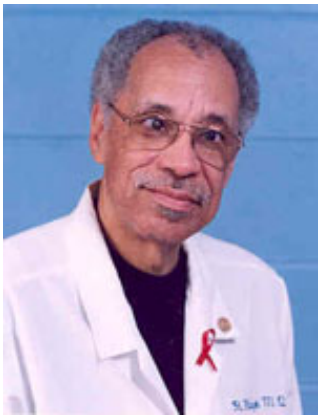
Robert L. Haynie, M.D., Ph.D.



Robert L. Haynie, M.D. is the Associate Dean for Student Affairs and Associate Clinical Professor of Medicine at Case Western Reserve University School of Medicine. He serves on numerous committees at CWRU, including the Admissions Committee, which he chaired from 1996 until 2000; Committee on Students, which he chaired from 1993 until 1995; Steering Committee of the Faculty Council; Board of Trustees of the CWRU Medical Alumni Association; Committee on Medical Education; Core Clerkship Directors Committee and the Dean's Minority Advisory Committee.

In the fall of 1967, Dr. Haynie entered the Case Western Reserve University School of Graduate Studies, where he obtained his Ph.D. in Chemistry in June of 1972. Subsequently, he moved to Chicago to join the faculty of Chicago State University, where he taught chemistry for two years. Dr. Haynie returned to Cleveland, where he completed medical school at CWRU and an internship and residency at Mt. Sinai. In 1982, Dr. Haynie joined the emergency medicine department at Mt. Sinai. After a period of private practice in internal medicine, he returned to Mt. Sinai as director of the Internal Medicine Residency Training Program, as well as director of the Medicine Clerkship Program from 1985 until 1989. He then became director of Mt. Sinai's Hypertension Control Center, which focused on clinical trials of newer pharmacological agents in the treatment of hypertension. From 1990 to 1995, Dr. Haynie was the director of the Transitional Year Program at Mt. Sinai. In 1994, he assumed the position of medical director of the Center of Urban Health, and from 1999 until the closing of Mt. Sinai in February 2000, held the position of chief of the Division of General Internal Medicine.

Dr. Haynie has received numerous awards, including Outstanding Professor at CWRU, Outstanding Professor of the Ohio College of Podiatric Medicine, The Mt. Sinai Medical Society Faculty Teaching Excellence Award, and the recipient of the 1995 CWRU School of Medicine Clifford J. Vogt, M.D.'34 Alumni Service Award.

Dr. Haynie is currently a member of the American Society of Hypertension (ASH) and, as of October 1999, was granted the designation *ASH Specialist in Clinical Hypertension*. He is also a member of the Cleveland Medical

Association, National Minority Organ and Tissue Transplant Education Program and the High Blood Pressure Council of Greater Cleveland. He was selected to be included in *Best Doctors in America 2001-2002 and 2003-2004.* Dr. Haynie has published a number of articles, primarily in the field of hypertension.

Preventive Medicine & Health Promotion: Fourth Year Elective

Introduction

"Thanks in large part to the work of the USPTF, it is no longer questioned that appropriate preventive care belongs at the top of the list of effective interventions that must be available to all Americans. At a time when the leading causes of death are largely related to health-related behaviors – including tobacco use, poor diet, lack of physical activity, and alcohol use – it is particularly pertinent to highlight the importance of the health consequences of behavior. It remains extraordinarily important that physicians and other providers educate their patients about these matters."

GUIDE TO CLINICAL PREVENTIVE SERVICES, Second Edition
PHILIP R. LEE, M.D.
Assistant Secretary for Health
U.S. Department of Health and Human Services
Washington, DC

In July of 2000, Dr. David Satcher, the Surgeon General of the United States, declared a need for prevention education in the basic medical education curriculum[1]. The Liaison Committee on Medical Education (LCME) agreed with Dr. Satcher's recommendations, noting medical faculty's responsibility to create a curriculum that includes preventive medicine.

The value of prevention is increasingly being emphasized in medical educational institutions due to the growing prevalence and incidence of preventable diseases in the U.S. population. The **Preventive Medicine Electronic Curriculum's goals** are to provide up-to-date, clinically relevant information and cutting edge research results regarding the broad fields included under the rubric of Preventive Medicine.

In January of 2000, the U.S. Department of Health and Human Services released Healthy People 2010, a prevention agenda that identifies the most significant preventable health threats and provides a road map toward improving health based on scientific knowledge and strategic management. This initiative has specific objectives in 28 focus areas with two overarching goals to increase the quality and years of healthy life and to eliminate Health Disparities.

The Guide to Clinical Preventive Services, Second edition was developed and published in 1996 by the U.S. Preventive Services Task Force (USPTF). The Guide was established to rigorously evaluate clinical research in order to provide science –based preventive recommendations for services including screening tests, counseling, immunizations, and chemoprevention. The mission of the task force served by the Guide is to 1. Evaluate the benefits of

individual services, 2. Create age-, gender-, and risk-based recommendations about services that should routinely be incorporated into primary medical care, and 3. Identify a research agenda for clinical preventive care. This second edition includes more than 200 services offered in primary care.

These prevention resources provide the basis for clinical guidelines presented in this course as they present an ideal platform for launching a basic curriculum that includes the core competencies in health promotion and disease prevention set forth by the American Association of Teachers of Preventive Medicine. The course material is structured toward our main objectives to provide guidelines and information for incorporating clinical preventive services into medical practice. Clinical preventive services are relevant to all disciplines of medicine; however it is most effective at the primary level mainly served by family practice, internal medicine, ob-gyn, and pediatric services.

One exciting feature of this curriculum is that it provides the Preventive Medicine Vertical Theme of the CWRU medical school curriculum in an electronic format. See **course instructions** and **course requirements** for information on completing this course.

1. Satcher, D. **Academic Medicine. 2000;75(7):S1**

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NEW ONLINE TYPE B ELECTIVE

COURSE #DGMS0003

CASE SCHOOL OF MEDICINE

BIT

THE CHALLENGE:

Health professionals can prevent many of the leading causes of death by using the proper interventions. Despite sound clinical reasons for emphasizing prevention in medicine, studies have shown that clinicians often fail to provide recommended clinical services.

Guide to Clinical PREVENTIVE SERVICES, Second Edition
Report of the U.S. Preventive Services Task Force

Increase in the prevalence of behavior-related illnesses in the United States

- 18.2 million Americans with diabetes, and nearly one third unaware that they have the disease
- More than 64% of the U.S. adult population are overweight or obese
- Heart disease and stroke account for more than 40% of all deaths each year
- Cancer has now surpassed heart disease as the leading killer in this country, killing more than half a million people each year
- More than 65 million Americans have hypertension

From the Department of Health and Human Services, Healthy People 2010

"Future physicians will need to address new and emerging health issues, policies, technologies, and practice guidelines."

"Education programs need to be updated periodically to reflect the latest in the science of prevention."

"No medical professional should graduate from an accredited institution without a basic understanding of the principles of prevention."

"The link between individual medical care and treatment and population-based health care is essential if we are to provide the highest quality health care possible to the entire U.S. population."

David Satcher, MD, PhD ACADEMIC MEDICINE, Vol. 5, No. 7/July Supplement 2000

OUR RESPONSE...

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This elective is available to our students anywhere they can access the Internet.
https://ecurriculum.case.edu/YearFour/preventive_med/index.htm

NEW ONLINE ELECTIVE IN PREVENTIVE MEDICINE

Interactive Patient Scenarios

Interactive Game

Online Pre- and Post-Course Surveys

Online Post-Course Examination

COURSE GOALS AND OBJECTIVES…

- **Provides** students with baseline understanding of principles of prevention and health promotion.
- **Assists** students in reconciling conflicting recommendations and guidelines among expert organizations.
- **Describes** basic concepts in epidemiology as they relate to clinical prevention and health promotion, including risk factor assessment, risk stratification, and testing features (sensitivity, specificity, positive and negative predictive value).
- **Distinguishes** between primary, secondary and tertiary preventive services.
- **Identifies** and develops strategies that address patient, physician, and systems-level barriers to delivery of preventive care.
- **Encourages** students to apply and share knowledge gained through the development of an educational module about disease prevention and health promotion in an area of interest.
- **Provides** necessary tools and information for students to counsel patients effectively on general and condition-specific behavioral modification strategies.

STUDENT COMMENTS

- "I liked the convenience of distance learning. I could access it at 2:00 in the morning if I wanted to."
- "I don't remember any other course during medical school that has offered an integrated approach to prevention or preventive medicine. This course presents new material and its content is not replicated anywhere else in the medical school curriculum."
- "As I think back on other electives I have taken, the amount of additional knowledge I gained by taking this course was much greater."
- "I would definitely recommend this elective to other students."

Interactive Game

Maryrose Bauschka, M.D., Patricia Quallich, BFA, Thomas M. Nosek, Ph.D., Robert Haynie, M.D., Ph.D., and C. Kent Smith, M.D.

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Preventive Medicine & Health Promotion: Fourth Year Elective

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Medical Education Survey

Preventive Medicine Pre-Course Survey

12/16/2003 12:01:00 AM - 12/16/2010 12:01:00 AM

* You can log back on to the survey system multiple times to complete/modify your answers.

In responding to the following questions, please think about how you have felt over the past six months:

01. How effective do you think you are in changing your patients` behavior with respect to the following:

a. Exercise?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

b. Healthy Diet?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

c. Weight Reduction?

○ Outstanding ○ Very Good ○ Satisfactory ○ Weak ○ Very Weak

02. In general, how important do you think it is for physicians to counsel patients about the following:

a. Cholesterol?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

b. Blood Pressure?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

c. Exercise?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

d. Healthy Diet?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

e. Weight Reduction?

○ Very Important ○ Somewhat Important ○ Of Little Importance ○ Of No Importance

Submit

John Gay, DVM PhD DACVPM AAHP FDIU VCS

Clinical Epidemiology & Evidence-Based Medicine Glossary:

Experimental Design and Statistics Terminology

Updated August 22, 1999

Contents:

A. General Statistical Terms:

1. **Statistics:** Statistics are the methods used to evaluate the effects of chance. They are the methods to quantify and evaluate information containing uncertainty of random origin (noise) in results from groups of individuals, each with inherent biological differences and thus biological variability, when these individuals represent a sample drawn from a population that could not be evaluated in its entirety (e.g., all the individuals on which the test could have been done, to which the treatment could have been applied, could have been vaccinated with the product, ...). Statistics are valid only to the degree that the opportunity for bias is minimized in the design and execution of the study.
2. **P-value:** The p-value is the probability that an outcome as large as or larger than that observed would occur in a properly designed, executed, and analyzed analytical study if in reality there was **no** difference between the groups, i.e., that the outcome was due entirely to chance variability of individuals or measurements alone. A p-value isn t the probability that a given result is wrong or right, the probability that the result occurred by chance, or a measure of the clinical significance of the results. A very small p-value cannot compensate for the presence of a large amount of systematic error (bias). If the opportunity for bias is large, the p-value is likely invalid and irrelevant. Some introductory texts seriously miss-define this term.
3. **Biological (Clinical) Significance:** Biological significance is the significance of the difference between outcomes in the clinical situation and must be determined by the

clinician with respect to the patient. Biological (clinical) significance is **unrelated** to statistical significance. What is biologically or clinically significant is measured in terms of a biological outcome (e.g., difference in measures such as morbidity or mortality, difference in weight gain). Many studies with statistically insignificant findings are not of sufficient size to detect the minimum clinically significant difference. Conversely, with a large enough sample size any study will obtain statistical significance for differences that are too small to have any biological (clinical) significance.

4. **Statistically Significant:** The conclusion that the results of a study are not likely to be due to chance alone because the P-value derived from the statistical analysis is smaller than the critical alpha value (usually 0.05). A conclusion of statistical significance must occur prior to (but is not directly related to) conclusions about biologic, clinical, or economic significance. No matter how small the P-value, the conclusion of statistical significance is valid only when opportunities for bias are minimal.
5. **Statistically Insignificant:** The conclusion that the results of a study are likely to be due to chance alone because the P-value derived from the statistical analysis is larger than the critical alpha value (usually 0.05). Note that this conclusion is not directly related to conclusions about biological, clinical, or economical significance unless one considers the minimum difference or effect that the study had the power to detect (but did not).
6. **Power:** Power is the likelihood that a study will detect a true difference of a given magnitude between groups if it actually exists (i.e., a true positive). Power is a function of study sample size, the biological variability in the population, the desired proportions of false positives (alpha) and false negatives (beta), and the type of statistical test used. Establishing the minimum clinically or biologically significant difference one wishes to detect and the power with which one wishes to detect at least that difference determine study size. Typical power levels are 0.80 and 0.90; higher powers require larger study sizes. The concept of power is extremely important because the lack of it (i.e., the study size was too small) can lead to statistical insignificance in the presence of biological significance.
7. **Sample:** A sample is a group of individuals that is a subset of a population and has been selected from the population in some fashion (random or haphazard).
8. **Sample Size (n):** The number of individuals in a group under study. The larger the sample size, the greater the precision and thus power for a given study design to detect an effect of a given size. For statisticians, an $n > 30$ is usually sufficient for the Central Limit Theorem to hold so that normal theory approximations can be used for measures such as the standard error of the mean. However, this sample size (n =30) is **unrelated** to the clinicians objective of detecting biologically significant effects, which determines the specific sample size needed for a specific study.
9. **Variability (Variation):** "Noise" due to random (chance) and non-random (systematic) factors that obscure the actual factor of interest.
    a. **Biological Variability:** Natural variability either within an individual over time due to diurnal cycles and other rhythms, biological repair mechanisms, intermittent and varying food consumption, aging, and so on or between individuals due to dietary differences, genetic differences, immune status differences, and so on. The

natural variability of a physiologic parameter in a normal individual tested over time often equals that in a population of normal individuals tested at one time. The presence of biological variability in a group generally means that studies of that group must be large, particularly if the variability is large compared to the size of the difference in the biological parameter being measured. Because biological repair mechanisms tend to reduce a disease in an individual over time, this source of biological variability must be taken in to account in study designs, particularly when individuals are compared with themselves over time. Otherwise, doing anything innocuous may appear to be associated with improvement, just as doing nothing would have been.

b. **Laboratory Variability:** Variability in the laboratory setting due to changing environmental conditions, aging and batch differences of testing components, personnel differences, and so on. Laboratory variability is minimized by testing samples collected over time from an individual all at one time and by replicating the tests on a single sample with the personnel blind to the replications.

c. **Observer Variability**: Variability due to differences in interpretation of measures that require any degree of subjective judgment (e.g., auscultation and palpation findings, radiographs, histology sections) either within the same observer over time or between observers. Observer variability is minimized by blinding observers to hypotheses, group assignment in trials, and other findings, by increasing objectivity of measures as much as possible, by providing standards and guidelines, and by training of observers. Observer variability can be random but is usually systematic (bias) and is usually due to human nature and the subtle effects of prior beliefs on perception rather than being due to deliberate deception.

10. **Correlation Coefficient (r)**: The Pearson s correlation coefficient is the extent to which the association between two variables can be described by a straight line. Plus one is a straight line with a positive slope and all data points being on the line, 0 being no linear association (completely random), and -1 being a straight line with a negative slope and all data points being on the line. Values in between -1 and +1 indicate that the data points are scattered around the line with values closer to zero indicating wider scatter. Depending on how the points are distributed, the correlation coefficient can be a very misleading indicator of the relationship between the two variables so looking at a plot of the data points is recommended.
11. **Coefficient of Determination (R^2):** The proportion of the variability observed in the response (or dependent) variable (from 0.0 to 1.0), that is accounted for by the statistical model of the predictor (or independent) variables, usually in the form of a linear regression equation. Note that the test of statistical significance of R^2 is usually whether it equals 0 or not, which is dependent on sample size, and is not a test of biological significance. For linear regression models with one predictor variable, R^2 is the square of the correlation coefficient.
12. **Confidence Interval (CI):** A confidence interval indicates the likely location of the true value of a measure estimated in a sample from a population, the width of which is inversely proportional to sample size. The "95" of a 95% CI means that the estimation

procedure has a 0.95 probability of producing an interval containing the true population value if the study is repeated numerous times. Note that this is the long-run probability that the interval contains the true value over many studies but is not the probability for the single study; the interval either does or does not include the true population value for a given study. A 100% interval is infinitely wide and 99%, 95% and 90% intervals are successively narrower. If the confidence intervals for a measure in two groups overlap, the measures are not statistically significantly different between the two groups. If the confidence intervals of comparative measures such as relative risk or odds ratios include 1 or 0 (if the measure is in log scale), the association between the risk factor and the outcome is not statistically significant.

13. **"Normally" (Gaussian) Distributed Data:** "Normally" distributed data are data whose frequency distribution "fits" (i.e., is closely approximated by) the bell-shaped curve described by the Gaussian distribution, which is an exact function described by the data mean and standard deviation. Such a distribution arises from the independent contributions of many sources of random variation of different magnitudes. Data distributed in this fashion allows the use of statistical procedures based on normal theory (e.g., t-tests). Note that "normally" distributed in the statistical sense has **no** relationship to "normal" in the medical sense.
14. **Non-parametric Test:** A non-parametric test is a statistical test or procedure that requires no assumptions about the distribution of the data (e.g., normally distributed) but rather uses the relative positions or ranks (sorted order) of the data points to establish a p-value. If data are normally distributed, these tests are less powerful than equivalent parametric procedures because not all the information contained in the data is used. However, under other conditions, the p-values from non-parametric tests are more valid, such as when applied to data with censored values, outliers, or non-normal distributions (i.e., most biologic data). Such tests are often called "robust".
15. **Parametric Test:** A parametric test is a statistical test or procedure using a quantitative measure (standard error, standard deviation, mean square error) of variability or spread in the data to establish a p-value (t-tests, ANOVA). For these tests to produce valid p-values, the data must closely follow Gaussian or "normal" distributions.

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B. **Data Types:** Form of the information obtained from observation and measurements, which determines the types of summary measures, analysis procedures, and graphical displays appropriate for the data.
    1. **Categorical Data:** Integer data with two or more exclusive categories that are enumerated (counted) rather than measured;. The values for a group of individuals are usually tabulated in a contingency (multi-cell row by column) table with each individual contributing only once to the table.
        a. **Binary (Dichotomous) Data:** Data with only two exclusive categories (alive /

dead, sick / well, smoker / non-smoker, pregnant / non-pregnant, high / low).

b. **Nominal:** Data values consist of scores that have no inherent ordering (hair color, breed, reproductive status (e.g., female, male, neutered)).
c. **Ordinal:** Data values consist of scores that are inherently ordered (e.g., disease severity 0, 1+, 2+, 3+, high / moderate / low). Note that unless the steps between the scores are equal, parametric procedures should not be used to summarize and compare such data.

2. **Continuous Data:** Data based on a continuous scale of measurement, such as age, weight, serum chemistry values, and temperature, that is not restricted to integer values and that is measured rather than enumerated. Continuous data can be reduced to discrete data by rounding and to categorical data by establishing cutoffs and classifying it into categories.
3. **Discrete Data:** Integer data based on an ordered scale with the same interval width between intervals such as parity (number of offspring), heart and respiratory counts per unit time, blood cell counts per unit volume.
4. **Qualitative (Subjective) Data:** Data, typically categorical, that are prone to observer variation and to low repeatability without strict, validated criteria (e.g., disease severity 0, 1+, 2+, 3+, ...).
5. **Quantitative (Objective) Data:** Data, typically measured with calibrated instrument, that are less prone to observer variation (age, weight, heart rate, ...).
6. **Primary Data:** Primary data are data collected by the investigators for the purposes of the study. This allows the opportunity to improve precision and to minimize measurement bias through the use of precise definitions, systematic procedures, trained observers, and blinding during data collection. Such data are usually expensive to acquire compared to secondary data.
7. **Secondary Data:** Secondary data are data collected for purposes other than that of the study, such as patient clinical records, and are used frequently for case-control studies. Because the investigator has no control over definitions, collection procedures, observers (clinicians) or other opportunities for measurement bias reduction, the opportunity for bias is large. The advantages of secondary data are that these data are usually considerably less expensive and much more readily available than are primary data. The severe disadvantage is the opportunity for the presence of large amounts of measurement bias.
8. **Censored (Truncated) Data:** Commonly, follow-up data are incomplete for some individuals in a study that occurs over time. Left-censored data occur when follow-up of an individual at risk of an event starts at a later time than other subjects. Right-censored data occur when an individual is lost to follow-up for reasons other than the occurrence of the event of interest, such as the end of the study, death due to another cause or simply loss of contact prior to the event of interest. Failure to account for individuals with censored data can seriously bias the results of a study.

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C. **Data Description:**

1. **Statistic:** A numerical value calculated to summarize the values in a sample and that provides an estimate of that characteristic in the population.
2. **Rank:** The position of a data value when the data values are sorted in numerical order.
3. **25th Percentile:** The data value that separates the bottom quarter of the data from the upper three-quarters, which numerically is the data value at rank 0.25 * (n + 1).
4. **Lower Quartile:** The lower quartile of a data set is those values below the 25th percentile, which is one-fourth of the data in a data set. The lower quartile data values that are not outliers are depicted by the lower whisker on a box-and-whisker plot.
5. **75th Percentile:** The data value that separates the top quarter of the data from the bottom three-quarters, which numerically is the data value at rank 0.75 * (n + 1).
6. **Upper Quartile:** The upper quartile is those values above the 75th percentile, which is one-fourth of the data in a data set. The upper quartile data values that are not outliers are depicted by the upper whisker on a box-and-whisker plot.
7. **Interquartile Range (IQR):** The difference between the values of the 25th and 75th percentiles, which define the boundaries of the middle one-half of the values of a data set when sorted in numerical order. The IQR appears as the width of the box on a box-and-whisker plot and contains one-half of the data values in a data set.
8. **Median (50th percentile):** The median is the value that exactly one-half of the values are less than and one-half of the values are more than when the values are sorted in numerical order. Numerically, the median is the data value at rank 0.5 * (n + 1). The median is a better measure than is the mean of the center of a data distribution when the data are not symmetrically (normally) distributed because it is not affected as severely as the mean by the outliers and non-symmetry typical of biological data. The median appears as a line in the box of a box-and-whisker plot and divides the middle two quartiles. Medians are compared by non-parametric statistical procedures.
9. **Mean (μ, x-bar):** The mean is the average value of a data set and mathematically is the sum of all values divided by the number of values. Used as a measure of the most common value, or "center", of a data distribution, the mean applies only to symmetrically (normally) distributed datasets and is severely affected by outliers common in biological data sets. Means are compared by parametric statistical procedures.
10. **Mode:** Most common data value, which is the highest peak of a frequency distribution. The mode is not particularly useful other than for describing shape: unimodal - one peak, bimodal - two peaks, ...
11. **Outlier:** Outliers are unusually large or small values compared to the rest of the data in a data set. Outliers are often defined as any value larger or smaller than the median plus or minus 1.5 times the interquartile range or any value 2 or more standard deviations from the mean in a large "normally" distributed data set. By convention, mild outliers are depicted by asterisks beyond the whiskers on box-and-whisker plots and severe outliers by open circles beyond the asterisks.
12. **Standard Deviation (SD, s):** The standard deviation is a mathematical measure of the spread or dispersion of the data around the mean value for normally distributed data. What

proportion of the data lies within multiples of the standard deviation depends upon the underlying distribution (e.g., t-distribution, "normal", normalized z, uniform).

13. **Standard Error of the Mean (SEM):** The precision of the estimate of a sample mean, which is very common in the literature. SEM is a measure of the spread of the sample means from repeated samples of a population and is the basis of parametric statistical procedures for comparing group means. Mathematically, the SEM is the SD divided by the square root of the sample size, meaning that it is always smaller than the SD. This relationship means that to halve the SEM, the n must be quadrupled. SEM is often used incorrectly in place of the SD to describe variability of individuals in a population.
14. **Standard Error of a Proportion (SEP):** The precision of the estimate of a proportion, which is very common in the literature. Mathematically, the standard error of a proportion p is $(p(1-p)/n)^{0.5}$ where n is the sample size. For reasonably large n and proportions that are not close to 0.0 or 1.0 so that normal theory approximations are reasonable, the confidence interval for the proportion is $p \pm 1.96 * SEP$.
15. **Range:** The range is the difference between the largest and smallest values in a set of data. Because of the severe influence of outliers on the range, it is not particularly useful statistically.

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D. **Data Display:**

1. **X-axis (Abscissa):** By convention, the horizontal axis of a plot or graph.
2. **Y-axis (Ordinate):** By convention, the vertical axis of a plot or graph.
3. **Error Bar:** "T" shaped bars of various lengths on plots that indicate the precision of the estimate of the mean value of a variable at that point. The length of the bar is usually the SEM (standard error of the mean) but may be the CI (confidence interval) or the SD (standard deviation) of that point.
4. **Frequency Plot:** A plot of the data distribution. The data values of the variable being plotted are on the x-axis, a count or percentage is on the y-axis. Each point on the plot indicates the number or percentage of the datapoints that have that value. The Gaussian or bell-shaped "normal" curve is a frequency plot.
5. **Box-and-Whisker Plot:** A frequency plot that indicates the median, the interquartile range (the box), the range of the non-outlier data (the whiskers), and the outliers in the data set;. Subsets of the data categorized by values of another variable (case-control status, sex, ...) may be plotted with their own set of boxes and whiskers on the same graph.
6. **Histogram:** A frequency plot using bars. The x-axis may be a continuous variable classified into categories or be a categorical variable.
7. **"Normal" (Gaussian) Curve:** A frequency plot of a "normal distribution" defined by a mean and standard deviation where 95% of the points lie within ± 1.96 standard deviations of the mean and 68% of the points lie within ± 1 standard deviation of the mean.

8. **Scatter Plot:** A plot of data points in which each point represents the simultaneous value of two variables, usually with the independent or explanatory variable on the x-axis and the dependent or outcome variable on the y-axis. The x-axis variable may be continuous, interval, or categorical. Scatterplots are often used to show relationships between levels of two variables.
9. **Epidemic Curve:** A histogram of the number of cases by time of onset.
10. **Survival Curve:** A plot of the probability that a member of a group is event-free up to a time point. The x-axis is follow-up time starting with a common zero time and the y-axis is a probability from 0.0 to 1.0. The name is derived from a plot of group mortality over time, but it has more general application; e.g. to recovery, pregnancy, or other health outcomes that occur in a group over time.

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E. **Statistical Analysis Methods:**

1. **Analysis of Variance (ANOVA):** The most common parametric procedure for comparing multiple group means by using mean square error in an F-test to produce a p-value.
2. **Linear Regression:** A parametric procedure for determining the relationship between one or more (multiple) continuous or categorical predictor (or independent) variables and a continuous outcome (or dependent) variable that results in an equation of the general form $y = ax + b$.
3. **Logistic Regression:** A special form of regression to determine the relationship between one or more continuous or categorical predictor variables and a binary outcome variable (live / dead, sick / well, ...). The regression procedure produces an equation that predicts an outcome probability between 0.0 and 1.0 for values of the predictor variables.
4. **Repeated Measures:** Data from successive testing of the same individuals over time or under different treatment. Such data usually requires special repeated measures analysis procedures to arrive at the correct statistical conclusion because later measurements on an individual are related to previous ones (i.e., are not independent). Analyzing such data as if they were single measurements on more individuals has been reported to be the most common error in veterinary data analysis (JAVMA 182:138(1985)), resulting in a biased p-value.
5. **C^2 (Chi-square) test:** A non-parametric test for association in categorical data arranged as counts in cells of a row by column table with the number of cells or counts equal to the number of rows times the number of columns.
6. **Two Sample (Independent) t-test:** A parametric test that determines whether the means from two independent groups are similar, within the bounds of chance variation.
7. **Paired (Dependent) t-test:** A parametric test that determines whether the mean difference obtain by testing the same individuals on two different occasions (e.g., before treatment, after treatment) is similar to zero, within the bounds of chance variation.
8. **Survival Analysis:** Procedures to compare survival curves.

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Clinical Epidemiology & Evidence-Based Medicine Glossary:

Terminology Specific to Clinical Testing

Updated August 22, 1999

Clinical Testing

A. **Test:** A test is anything that produces evidence from a patient at any stage in the clinical process, based on which a different clinical course will be taken depending on the different possible test outcomes (positive or negative, normal or abnormal, present or absent, high or low, ...). From the lay perspective, a laboratory test performed on a specimen (feces, urine, blood, CSF, biopsy, ...) from a patient. From the clinical epidemiology perspective, the following are examples of a "test": history taking (presence or absence of a component), clinical exam results (presence or absence of a sign), imaging findings (presence or absence of a feature on a radiograph), or response to therapy (as anticipated or not). Few if any tests in medicine are perfect; that is, produce results that can always be interpreted with absolute certainty on every patient to which the test is applied. The performance of tests can be compared objectively (e.g., two clinicians (the "tests") can be compared in their ability to detect a particular clinical sign in each of a group of patients).
    1. **Sensitive Test:** In a diagnostic sense, a higher proportion of the individuals with the disease will test positive than with a less sensitive test.
    2. **Specific Test:** In a diagnostic sense, a higher proportion of the individuals without the disease will test negative than with a less specific test.
    3. **Screening Test:** A test applied to individuals without observed signs of disease and in which differential diagnoses of the disease of interest or clinically similar diseases have not been established. That is, the population being tested is comprised predominately of normal individuals that have not been identified as possibly having a clinical case of the disease. Thus, the probability that such an individual has the disease is the prevalence of the disease in the population being screened. Because the disease manifestations are likely minimal in affected individuals, the spectrum of disease is generally less severe in a screening than in a diagnostic setting.
    4. **Diagnostic Test:** A test used in the clinical environment on individuals with clinical signs or other clinical information consistent with the presence of the condition. The presence of disease has been recognized and the disease of interest is one of the differential diagnoses. This fact raises the expected prevalence (the clinician s estimate of the probability that the individual has the disease based on what the clinician knows to that point) prior to

performing the test and thus changes the test performance considerably compared to the situation when the same test is used as a screening test (the probability that a randomly selected individual has the disease is the prevalence of the disease in that population). Affected individuals are more likely to have more prominent disease manifestations in the clinical setting, meaning that the spectrum of disease is generally more severe for in a diagnostic than in a screening setting.

5. **"Gold" Standard Reference (Definitive) Test:** The tests and procedures necessary to definitively establish to a high level of certainty the presence or absence of the disease in an individual. The reference standard usually requires death (necropsy examination) or is too expensive, too risky, or too slow to be used regularly in the clinical setting. For inevitably progressive, chronic conditions, the "gold standard" may be prolonged follow-up. Note that the standard test, the current most widely accepted test used day-to-day, is often not the "gold" standard test and using it as such may be a serious (but not uncommon) mistake.

B. **Accuracy:** Accuracy is the degree to which, on average, a test represents the true value (that is, is unbiased). Accuracy is insufficient for describing the performance of medical tests and deciding when to use what because accuracy has two separate components (see Se, Sp below) and is dependent on the prevalence of the condition for which the test is appropriate.

C. **Precision:** Precision is the inverse of the influence of random or chance error on a measurement, with the less the error the greater the precision. When testing an individual, repeating the measurements and using a summary value increases precision. When testing individuals to learn more about a group, precision is increased by increasing the number of individuals tested (i.e., increasing sample size) and increases as the reciprocal of the square root of the number tested. However, precise measurements may still deviate systematically from the true value and thus be biased or invalid, a problem that can t be reduced by repeating the measurements on an individual or testing more individuals in a group.

D. **Disease Spectrum:** For sensitivity of diagnostic tests, the disease spectrum is the range of the disease states represented by the diseased individuals (acute vs. chronic or convalescent cases, mild vs. severe cases, clinical vs. subclinical). For specificity of diagnostic tests, the disease spectrum is the range of the disease states in the individuals with diseases presenting similar clinical signs but not having the disease of interest. The two disease spectrums among the patients used to develop tests tend to be more severe than those of the typical clinical situation, meaning that test performance in practice is often lower than published estimates. Removing the test positives from a group changes the two disease spectrums, which is likely to adversely affect the performance of subsequent tests. For determining sensitivity and specificity of screening tests, the appropriate disease spectrums are those of a cross-section of an appropriate population, which are usually less severe than those of individuals being diagnosed in clinical settings.

E. **Baye s Theorem:** The mathematical relationship between the probability that an individual has the disease before the test is run to the probability that the individual has the disease after the test result is known. This theorem relates five different probabilities (Se, Sp, Pvn, Pvp, and Pr) and is crucial to understanding how to optimize the use of imperfect tests in the diagnostic process. Baye s theorem essentially relates the certainty that the individual has a disease prior to doing the test, the two possible test results, and the certainty that the individual has the disease after doing

the test.

F. **Test Performance Measures:**

1. **False Negative (Fn):** An individual that is test negative but is disease positive (equivalent to a type II error in statistics, governed by Beta). False negatives are undesirable test outcomes as such individuals are missclassified.
2. **False Positive (Fp):** An individual that is test positive but is disease negative (equivalent to a type I error in statistics, governed by alpha). False positives are undesirable test outcomes as such individuals are missclassified.
3. **True Negative (Tn):** An individual that is both test negative and disease negative.
4. **True Positive (Tp):** An individual that is both test positive and disease positive.
5. **Diagnostic Sensitivity (Se):** Given that an individual has the disease, sensitivity is the probability (between 0 and 1.0) that the individual will test positive. For groups, sensitivity is the proportion of diseased individuals that will test positive. Sensitivity is mathematically equivalent to Tp / (Tp + Fn). Raising a test s Se by changing its cutoff lowers the test s specificity. Note that although many mistakenly view this value as fixed, Se depends on the spectrum of the target disease that is present in the group or conceptual population that the test is being applied to.
6. **Analytical Sensitivity:** Analytical sensitivity is the ability of a test to detect the target analyte, such as an antibody or antigen, and usually expressed as the minimum concentration of the analyte that can be detected. Analytical sensitivity is related to the sensitivity above but is not a probability.
7. **Diagnostic Specificity (Sp):** Given that an individual does not have the disease, specificity is the probability that the individual will test negative. For groups, specificity is the proportion of non-diseased individuals that will test negative. Specificity is mathematically equivalent to Tn / (Tn + Fp). Raising a test s Sp by changing its cutoff lowers the test s Se. Note that although many mistakenly view this value as fixed, for diagnostic tests Sp depends on the disease spectrum of the competing diseases in the conceptual population that the test is being applied to. The competing diseases are often different for individuals in different regions and different circumstances.
8. **Negative Predictive Value (Pvn):** Given a negative test result (the clinician s perspective), negative predictive value is the probability that the individual does not have the disease. Negative predictive value is the proportion of individuals without the disease that are correctly diagnosed. Negative predictive value is mathematically equivalent to Tn / (Tn + Fn). Note that for a given Se and Sp, this value changes depending on the disease prevalence estimate prior to the testing being done.
9. **Positive Predictive Value (Pvp):** Given a positive test result (the clinician s perspective), positive predictive value is the probability that the individual actually has the disease. Positive predictive value is the proportion of individuals with the disease that are correctly diagnosed. Positive predictive value is mathematically equivalent to Tp / (Tp + Fp). Note that for a given Se and Sp, this value changes depending on the disease prevalence estimate prior to the testing being done.
10. **Receiver Operator Characteristic (ROC) Curve:** Plot of Sensitivity vs. (1 - Specificity)

for different test cutoff values, which is used to establish the "best" cutoff for a test with variable parameters. The optimum cutoff depends on the relative costs of false-positives and false-negatives.

11. **Apparent Prevalence (Test Prevalence):** The proportion of test positives in the population tested. Note that apparent prevalence is equivalent to disease prevalence under most circumstances only if a perfect test (no false negatives or false positives) is used.

G. **Information Gain:** Having done a test, the amount of information the clinician gained about the probability that the individual has the disease. This is the difference between the clinician s estimate of the probability that an individual has the disease before the test is done and the probability that the individual has the disease after the test result is known. Depending on the test s Se and Sp values, on the pre-test probability, and in a relationship that is defined by Baye s Theorem, the information gain from a positive test is usually different from the information gain from a negative test.
    1. **Rule-in Test:** A rule-in test has a large information gain when it is positive, which means that the clinician keeps the differential on the list. In a diagnostic situation, tests with very high specificity are generally rule-in tests.
    2. **Rule-out Test:** A rule-out test has a large information gain when it is negative, which means the clinician removes the differential from the list. In a diagnostic situation, tests with very high sensitivity are generally rule-out tests.
    3. **Negative Likelihood Ratio:** The number of times more likely that a negative test comes from an individual with the disease rather than from an individual without the disease. Equivalent to (1 - Se) / Sp.
    4. **Positive Likelihood Ratio:** The number of times more likely that a positive test comes from an individual with the disease rather than from an individual without the disease. Equivalent to Se / (1 - Sp).

H. **Reproducibility (Repeatability, Consistency):** The degree to which a test yields the same results when repeated under identical conditions on identical specimens.

I. **Reliability:** How good is a procedure when applied by different users. The degree to which different clinicians (observers) applying the procedure classify diseased individuals into the same diagnostic, prognostic or treatment categories.

J. **Cohen s Kappa (k):** Cohen s Kappa is a measure for comparing two tests. It is a summary measure, ranging between -1 and +1, of the level of agreement beyond chance when two tests (or observers) are classifying the same set of specimens into two or more exclusive categories (e.g., infected, not infected or normal, mild, moderate, severe, critical) with 0 being no agreement beyond that expected by chance, 1 being complete agreement, and -1 being contrary to agreement. This measure is used when two imperfect tests (or observers) are being compared rather one test (or observer) being compared with the "Gold" or definitive standard. When the classification categories are ordered and more than three (e.g., normal, mild, severe, critical), Cohen s Kappa often underestimates the degree of actual agreement and a weighted Kappa or other statistic captures it better. Many components of the clinical examination range between 0.4 and 0.7, which is the source of many differences between clinicians.
    1. **Intra-Rater Agreement:** A measure of repeatability. The level of agreement beyond chance, typically quantified by Cohen s Kappa, that a test or observer has with itself or

themselves ("intra" = within) when repeated on the same set of materials. For example, the agreement that an observer such as radiologist has with themselves when they unknowingly (blindly) repeat reading the same films.

2. **Inter-Rater Agreement:** A measure of reliability. The level of agreement beyond chance, typically quantified by Cohen s Kappa, that two different tests (observers) have ("inter" = between) when performed on the same materials. For example, the agreement that two observers such as two radiologists have between them when they unknowingly (blindly) read the same films or that two different diagnostic tests have when they are performed on the same specimens.

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Reproductive Health: Glossary

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- **AGE-ADJUSTED MORTALITY RATE.** A mortality rate statistically modified to eliminate the effect of different age distributions in the different populations.
- **AGENT.** A factor, such as a microorganism, chemical substance, or form of radiation, whose presence, excessive presence, or (in deficiency diseases) relative absence is essential for the occurrence of a disease.
- **AGE-SPECIFIC MORTALITY RATE.** A mortality rate limited to a particular age group. The numerator is the number of deaths in that age group; the denominator is the number of persons in that age group in the population.
- **ANALYTIC EPIDEMIOLOGY.** The aspect of epidemiology concerned with the search for health-related causes and effects. Uses comparison groups, which provide baseline data, to quantify the association between exposures and outcomes, and test hypotheses about causal relationships.
- **ANALYTIC STUDY.** A comparative study intended to identify and quantify associations, test hypotheses, and identify causes. Two common types are cohort study and case-control study.
- **APPLIED EPIDEMIOLOGY.** The application or practice of epidemiology to address public health issues.
- **ASSOCIATION.** Statistical relationship between two or more events, characteristics, or other variables.
- **ATTACK RATE.** A variant of an incident rate, applied to a narrowly defined population observed for a limited period of time, such as during an epidemic.
- **ATTRIBUTABLE PROPORTION.** A measure of the public health impact of a causative factor; proportion of a disease in a group that is exposed to a particular factor which can be attributed to their exposure to that factor.

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- **BAR CHART.** A visual display of the size of the different categories of a variable. Each category or value of the variable is represented by a bar.
- **BIAS**. Deviation of results or inferences from the truth, or processes leading to such systematic deviation. Any trend in the collection, analysis, interpretation, publication, or review of data that can lead to conclusions that are systematically different from the truth.
- **BIOLOGIC TRANSMISSION.** The indirect vector-borne transmission of an infectious agent in which the agent undergoes biologic changes within the vector before being transmitted to a new host.
- **BOX PLOT.** A visual display that summarizes data using a ``box and whiskers'' format to show the minimum and maximum values (ends of the whiskers), interquartile range (length of the box), and median (line through the box).

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- **CARRIER.** A person or animal without apparent disease who harbors a specific infectious agent and is capable of transmitting the agent to others. The carrier state may occur in an individual with an infection that is inapparent throughout its course (known as asymptomatic carrier), or during the incubation period, convalescence, and postconvalescence of an individual with a clinically recognizable disease. The carrier state may be of short or long duration (transient carrier or chronic carrier).
- **CASE.** In epidemiology, a countable instance in the population or study group of a particular disease, health disorder, or condition under investigation. Sometimes, an individual with the particular disease.
- **CASE-CONTROL STUDY.** A type of observational analytic study. Enrollment into the study is based on presence (``case'') or absence (``control'') of disease. Characteristics such as previous exposure are then compared between cases and controls.
- **CASE DEFINITION.** A set of standard criteria for deciding whether a person has a particular disease or health-related condition, by specifying clinical criteria and limitations on time, place, and person.
- **CASE-FATALITY RATE.** The proportion of persons with a particular condition (cases) who die from that condition. The denominator is the number of incident cases; the numerator is the number of cause-specific deaths among those cases.

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CAUSE OF DISEASE. A factor (characteristic, behavior, event, etc.) that directly influences the occurrence of disease. A reduction of the factor in the population should lead to a reduction in the occurrence of disease.

CAUSE-SPECIFIC MORTALITY RATE. The mortality rate from a specified cause for a population. The numerator is the number of deaths attributed to a specific cause during a specified time interval; the denominator is the size of the population at the midpoint of the time interval.

CENSUS. The enumeration of an entire population, usually with details being recorded on residence, age, sex, occupation, ethnic group, marital status, birth history, and relationship to head of household.

CHAIN OF INFECTION. A process that begins when an agent leaves its reservoir or host through a portal of exit, and is conveyed by some mode of transmission, then enters through an appropriate portal of entry to infect a susceptible host.

CLASS INTERVAL. A span of values of a continuous variable which are grouped into a single category for a frequency distribution of that variable.

CLUSTER. An aggregation of cases of a disease or other health-related condition, particularly cancer and birth defects, which are closely grouped in time and place. The number of cases may or may not exceed the expected number; frequently the expected number is not known.

COHORT. A well-defined group of people who have had a common experience or exposure, who are then followed up for the incidence of new diseases or events, as in a cohort or prospective study. A group of people born during a particular period or year is called a birth cohort.

COHORT STUDY. A type of observational analytic study. Enrollment into the study is based on exposure characteristics or membership in a group. Disease, death, or other health-related outcomes are then ascertained and compared.

COMMON SOURCE OUTBREAK. An outbreak that results from a group of persons being exposed to a common noxious influence, such as an infectious agent or toxin. If the group is exposed over a relatively brief period of time, so that all cases occur within one incubation period, then the common source outbreak is further classified as a point source outbreak. In some common source outbreaks, persons may be exposed over a period of days, weeks, or longer, with the exposure being either intermittent or continuous.

CONFIDENCE INTERVAL. A range of values for a variable of interest, e.g., a rate, constructed so that this range has a specified probability of including the true value of the variable. The specified probability is called the confidence level, and the end points of the confidence interval are called the confidence limits.

CONFIDENCE LIMIT. The minimum or maximum value of a confidence interval.

CONTACT. Exposure to a source of an infection, or a person so exposed.

CONTAGIOUS. Capable of being transmitted from one person to another by contact or close proximity.

CONTINGENCY TABLE. A two-variable table with cross-tabulated data.

CONTROL. In a case-control study, comparison group of persons without disease.

CRUDE MORTALITY RATE. The mortality rate from all causes of death for a population.

CUMULATIVE FREQUENCY. In a frequency distribution, the number or proportion of cases or events with a particular value or in a particular class interval, plus the total number or proportion of cases or events with smaller values of the variable.

CUMULATIVE FREQUENCY CURVE. A plot of the cumulative frequency rather than the actual frequency for each class interval of a variable. This type of graph is useful for identifying medians, quartiles, and other percentiles.

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DEATH-TO-CASE RATIO. The number of deaths attributed to a particular disease during a specified time period divided by the number of new cases of that disease identified during the same time period.

DEMOGRAPHIC INFORMATION. The ``person'' characteristics--age, sex, race, and occupation--of descriptive epidemiology used to characterize the populations at risk.

DENOMINATOR. The lower portion of a fraction used to calculate a rate or ratio. In a rate, the denominator is usually the population (or population experience, as in person-years, etc.) at risk.

DEPENDENT VARIABLE. In a statistical analysis, the outcome variable(s) or the variable(s) whose values are a function of other variable(s) (called independent variable(s) in the relationship under study).

DESCRIPTIVE EPIDEMIOLOGY. The aspect of epidemiology concerned with organizing and summarizing health-related data according to time, place, and person.

DETERMINANT. Any factor, whether event, characteristic, or other definable entity, that brings about change in a health condition, or in other defined characteristics.

DIRECT TRANSMISSION. The immediate transfer of an agent from a reservoir to a susceptible host by direct contact or droplet spread.

DISTRIBUTION. In epidemiology, the frequency and pattern of health-related characteristics and events in a population. In statistics, the observed or theoretical frequency of values of a variable.

DOT PLOT. A visual display of the actual data points of a noncontinuous variable.

DROPLET NUCLEI. The residue of dried droplets that may remain suspended in the air for long periods, may be blown over great distances, and are easily inhaled into the lungs and exhaled.

DROPLET SPREAD. The direct transmission of an infectious agent from a reservoir to a susceptible host by spray with relatively large, short-ranged aerosols produced by sneezing, coughing, or talking.

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ENDEMIC DISEASE. The constant presence of a disease or infectious agent within a given geographic area or population group; may also refer to the usual prevalence of a given disease within such area or group.

ENVIRONMENTAL FACTOR. An extrinsic factor (geology, climate, insects, sanitation, health services, etc.) which affects the agent and the opportunity for exposure.

EPIDEMIC. The occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time.

EPIDEMIC CURVE. A histogram that shows the course of a disease outbreak or epidemic by plotting the number of cases by time of onset.

EPIDEMIC PERIOD. A time period when the number of cases of disease reported is greater than expected.

EPIDEMIOLOGIC TRIAD. The traditional model of infectious disease causation. Includes three components: an external agent, a susceptible host, and an environment that brings the host and agent together, so that disease occurs.

EPIDEMIOLOGY. The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.

EVALUATION. A process that attempts to determine as systematically and objectively as possible the relevance, effectiveness, and impact of activities in the light of their objectives.

EXPERIMENTAL STUDY. A study in which the investigator specifies the exposure category for each individual (clinical trial) or community (community trial), then follows the individuals or community to detect the effects of the exposure.

EXPOSED (GROUP). A group whose members have been exposed to a supposed cause of disease or health state of interest, or possess a characteristic that is a determinant of the health outcome of interest.

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FREQUENCY DISTRIBUTION. A complete summary of the frequencies of the values or categories of a variable; often displayed in a two column table: the left column lists the individual values or categories, the right column indicates the number of observations in each category.

FREQUENCY POLYGON. A graph of a frequency distribution with values of the variable on the x-axis and the number of observations on the y-axis; data points are plotted at the midpoints of the intervals and are connected with a straight line.

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GRAPH. A way to show quantitative data visually, using a system of coordinates.

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HEALTH. A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

HEALTH INDICATOR. A measure that reflects, or indicates, the state of health of persons in a defined population, e. g., the infant mortality rate.

HEALTH INFORMATION SYSTEM. A combination of health statistics from various sources, used to derive information about health status, health care, provision and use of services, and impact on health.

HIGH-RISK GROUP. A group in the community with an elevated risk of disease.

HISTOGRAM. A graphic representation of the frequency distribution of a continuous variable. Rectangles are drawn in such a way that their bases lie on a linear scale representing different intervals, and their heights are proportional to the frequencies of the values within each of the intervals.

HOST. A person or other living organism that can be infected by an infectious agent under natural conditions.

HOST FACTOR. An intrinsic factor (age, race, sex, behaviors, etc.) which influences an individual's exposure, susceptibility, or response to a causative agent.

HYPERENDEMIC DISEASE. A disease that is constantly present at a high incidence and/or prevalence rate.

HYPOTHESIS. A supposition, arrived at from observation or reflection, that leads to refutable predictions. Any conjecture cast in a form that will allow it to be tested and refuted.

HYPOTHESIS, NULL. The first step in testing for statistical significance in which it is assumed that the exposure is not related to disease.

HYPOTHESIS, ALTERNATIVE. The hypothesis, to be adopted if the null hypothesis proves implausible, in which exposure is associated with disease.

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IMMUNITY, ACTIVE. Resistance developed in response to stimulus by an antigen (infecting agent or vaccine) and usually characterized by the presence of antibody produced by the host.

IMMUNITY, HERD. The resistance of a group to invasion and spread of an infectious agent, based on the resistance to infection of a high proportion of individual members of the group. The resistance is a product of the number susceptible and the probability that those who are susceptible will come into contact with an infected person.

IMMUNITY, PASSIVE. Immunity conferred by an antibody produced in another host and acquired naturally by an infant from its mother or artificially by administration of an antibody-containing preparation (antiserum or immune globulin).

INCIDENCE RATE. A measure of the frequency with which an event, such as a new case of illness, occurs in a population over a period of time. The denominator is the population at risk; the numerator is the number of new cases occurring during a given time period.

INCUBATION PERIOD. A period of subclinical or inapparent pathologic changes following exposure, ending with the onset of symptoms of infectious disease.

INDEPENDENT VARIABLE. An exposure, risk factor, or other characteristic being observed or measured that is hypothesized to influence an event or manifestation (the dependent variable).

INDIRECT TRANSMISSION. The transmission of an agent carried from a reservoir to a susceptible host by suspended air particles or by animate (vector) or inanimate (vehicle) intermediaries.

INDIVIDUAL DATA. Data that have not been put into a frequency distribution or rank ordered.

INFECTIVITY. The proportion of persons exposed to a causative agent who become infected by an infectious disease.

INFERENCE, STATISTICAL. In statistics, the development of generalizations from sample data, usually with calculated degrees of uncertainty.

INTERQUARTILE RANGE. The central portion of a distribution, calculated as the difference between the third quartile and the first quartile; this range includes about one-half of the observations in the set, leaving one-quarter of the observations on each side.

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LATENCY PERIOD. A period of subclinical or inapparent pathologic changes following exposure, ending with the onset of symptoms of chronic disease.

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MEAN, ARITHMETIC. The measure of central location commonly called the average. It is calculated by adding together all the individual values in a group of measurements and dividing by the number of values in the group.

MEAN, GEOMETRIC. The mean or average of a set of data measured on a logarithmic scale.

MEASURE OF ASSOCIATION. A quantified relationship between exposure and disease; includes relative risk, rate ratio, odds ratio.

MEASURE OF CENTRAL LOCATION. A central value that best represents a distribution of data. Measures of central location include the mean, median, and mode. Also called the measure of central tendency.

MEASURE OF DISPERSION. A measure of the spread of a distribution out from its central value. Measures of dispersion used in epidemiology include the interquartile range, variance, and the standard deviation.

MEDIAN. The measure of central location which divides a set of data into two equal parts.

MEDICAL SURVEILLANCE. The monitoring of potentially exposed individuals to detect early symptoms of disease.

MIDRANGE. The halfway point or midpoint in a set of observations. For most types of data, it is calculated as the sum of the smallest observation and the largest observation, divided by two. For age data, one is added to the numerator. The midrange is usually calculated as an intermediate step in determining other measures.

MODE. A measure of central location, the most frequently occurring value in a set of observations.

MORBIDITY. Any departure, subjective or objective, from a state of physiological or psychological well-being.

MORTALITY RATE. A measure of the frequency of occurrence of death in a defined population during a specified interval of time.

MORTALITY RATE, INFANT. A ratio expressing the number of deaths among children under one year of age reported during a given time period divided by the number of births reported during the same time period. The infant mortality rate is usually expressed per 1,000 live births.

MORTALITY RATE, NEONATAL. A ratio expressing the number of deaths among children from birth up to but not including 28 days of age divided by the number of live births reported during the same time period. The neonatal mortality rate is usually expressed per 1,000 live births.

MORTALITY RATE, POSTNEONATAL. A ratio expressing the number of deaths among children from 28 days up to but not including 1 year of age during a given time period divided by the number of lives births reported during the same time period. The postneonatal mortality rate is usually expressed per 1,000 live births.

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NATURAL HISTORY OF DISEASE. The temporal course of disease from onset (inception) to resolution.

NECESSARY CAUSE. A causal factor whose presence is required for the occurrence of the effect (of disease).

NOMINAL SCALE. Classification into unordered qualitative categories; e.g., race, religion, and country of birth as measurements of individual attributes are purely nominal scales, as there is no inherent order to their categories.

NORMAL CURVE. A bell-shaped curve that results when a normal distribution is graphed.

NORMAL DISTRIBUTION. The symmetrical clustering of values around a central location. The properties of a normal distribution include the following: (1) It is a continuous, symmetrical distribution; both tails extend to infinity; (2) the arithmetic mean, mode, and median are identical; and, (3) its shape is completely determined by the mean and standard deviation.

NUMERATOR. The upper portion of a fraction.

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OBSERVATIONAL STUDY. Epidemiological study in situations where nature is allowed to take its course. Changes or differences in one characteristic are studied in relation to changes or differences in others, without the intervention of the investigator.

ODDS RATIO. A measure of association which quantifies the relationship between an exposure and health outcome from a comparative study; also known as the cross-product ratio.

ORDINAL SCALE. Classification into ordered qualitative categories; e.g., social class (I, II, III, etc.), where the values have a distinct order, but their categories are qualitative in that there is no natural (numerical) distance between their positive values.

OUTBREAK. Synonymous with epidemic. Sometimes the preferred word, as it may escape sensationalism associated with the word epidemic. Alternatively, a localized as opposed to generalized epidemic.

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PANDEMIC. An epidemic occurring over a very wide area (several countries or continents) and usually affecting a large proportion of the population.

PATHOGENICITY. The proportion of persons infected, after exposure to a causative agent, who then develop clinical disease.

PERCENTILE. The set of numbers from 0 to 100 that divide a distribution into 100 parts of equal area, or divide a set of ranked data into 100 class intervals with each interval containing 1/100 of the observations. A particular percentile, say the 5th percentile, is a cut point with 5 percent of the observations below it and the remaining 95% of the observations above it.

PERIOD PREVALENCE. The amount a particular disease present in a population over a period of time.

PERSON-TIME RATE. A measure of the incidence rate of an event, e.g., a disease or death, in a population at risk over an observed period to time, that directly incorporates time into the denominator.

PIE CHART. A circular chart in which the size of each ``slice'' is proportional to the frequency of each category of a variable.

POINT PREVALENCE. The amount of a particular disease present in a population at a single point in time.

POPULATION. The total number of inhabitants of a given area or country. In sampling, the population may refer to the units from which the sample is drawn, not necessarily the total population of people.

PREDICTIVE VALUE POSITIVE. A measure of the predictive value of a reported case or epidemic; the proportion of cases reported by a surveillance system or classified by a case definition which are true cases.

- **PREVALENCE.** The number or proportion of cases or events or conditions in a given population.
- **PREVALENCE RATE.** The proportion of persons in a population who have a particular disease or attribute at a specified point in time or over a specified period of time.
- **PROPAGATED OUTBREAK.** An outbreak that does not have a common source, but instead spreads from person to person.
- **PROPORTION**. A type of ratio in which the numerator is included in the denominator. The ratio of a part to the whole, expressed as a ``decimal fraction'' (e.g., 0.2), as a fraction (1/5), or, loosely, as a percentage (20%).
- **PROPORTIONATE MORTALITY.** The proportion of deaths in a specified population over a period of time attributable to different causes. Each cause is expressed as a percentage of all deaths, and the sum of the causes must add to 100%. These proportions are not mortality rates, since the denominator is all deaths, not the population in which the deaths occurred.
- **PUBLIC HEALTH SURVEILLANCE.** The systematic collection, analysis, interpretation, and dissemination of health data on an ongoing basis, to gain knowledge of the pattern of disease occurrence and potential in a community, in order to control and prevent disease in the community.

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- **RACE-SPECIFIC MORTALITY RATE.** A mortality rate limited to a specified racial group. Both numerator and denominator are limited to the specified group.
- **RANDOM SAMPLE.** A sample derived by selecting individuals such that each individual has the same probability of selection.
- **RANGE.** In statistics, the difference between the largest and smallest values in a distribution. In common use, the span of values from smallest to largest.
- **RATE.** An expression of the frequency with which an event occurs in a defined population.
- **RATE RATIO.** A comparison of two groups in terms of incidence rates, person-time rates, or mortality rates.
- **RATIO.** The value obtained by dividing one quantity by another.
- **RELATIVE RISK.** A comparison of the risk of some health-related event such as disease or death in two groups.
- **REPRESENTATIVE SAMPLE.** A sample whose characteristics correspond to those of the original population or reference population.
- **RESERVOIR.** The habitat in which an infectious agent normally lives, grows and multiplies; reservoirs include human reservoirs, animals reservoirs, and environmental reservoirs.
- **RISK.** The probability that an event will occur, e.g. that an individual will become ill or die within a stated period of time or age.
- **RISK FACTOR**. An aspect of personal behavior or lifestyle, an environmental exposure, or an inborn or inherited characteristic that is associated with an increased occurrence of disease or other health-related event or condition.
- **RISK RATIO.** A comparison of the risk of some health-related event such as disease or death in two groups.

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- **SAMPLE.** A selected subset of a population. A sample may be random or non-random and it may be representative or non-representative.
- **SCATTER DIAGRAM.** A graph in which each dot represents paired values for two continuous variables, with the x-axis representing one variable and the y-axis representing the other; used to display the relationship between the two variables; also called a scattergram.
- **SEASONALITY.** Change in physiological status or in disease occurrence that conforms to a regular seasonal pattern.
- **SECONDARY ATTACK RATE.** A measure of the frequency of new cases of a disease among the contacts of known cases.
- **SECULAR TREND.** Changes over a long period of time, generally years or decades.
- **SENSITIVITY.** The ability of a system to detect epidemics and other changes in disease occurrence. The proportion of persons with disease who are correctly identified by a screening test or case definition as having disease.
- **SENTINEL SURVEILLANCE.** A surveillance system in which a pre-arranged sample of reporting sources agrees to report all cases of one or more notifiable conditions.
- **SEX-SPECIFIC MORTALITY RATE.** A mortality rate among either males or females.
- **SKEWED.** A distribution that is asymmetrical.
- **SPECIFICITY.** The proportion of persons without disease who are correctly identified by a screening test or case definition as not having disease.

- **SPORADIC.** A disease that occurs infrequently and irregularly.
- **SPOT MAP.** A map that indicates the location of each case of a rare disease or outbreak by a place that is potentially relevant to the health event being investigated, such as where each case lived or worked.
- **STANDARD DEVIATION.** The most widely used measure of dispersion of a frequency distribution, equal to the positive square root of the variance.
- **STANDARD ERROR (OF THE MEAN).** The standard deviation of a theoretical distribution of sample means about the true population mean.
- **SUFFICIENT CAUSE.** A causal factor or collection of factors whose presence is always followed by the occurrence of the effect (of disease).
- **SURVEILLANCE.** see **PUBLIC HEALTH SURVEILLANCE**
- **SURVIVAL CURVE.** A curve that starts at 100% of the study population and shows the percentage of the population still surviving at successive times for as long as information is available. May be applied not only to survival as such, but also to the persistence of freedom from a disease, or complication or some other endpoint.

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- **TABLE.** A set of data arranged in rows and columns.
- **TABLE SHELL.** A table that is complete except for the data.
- **TRANSMISSION OF INFECTION.** Any mode or mechanism by which an infectious agent is spread through the environment or to another person.
- **TREND.** A long-term movement or change in frequency, usually upwards or downwards.

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- **UNIVERSAL PRECAUTIONS.** Recommendations issued by CDC to minimize the risk of transmission of bloodborne pathogens, particularly HIV and HBV, by health care and public safety workers. Barrier precautions are to be used to prevent exposure to blood and certain body fluids of all patients.

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- **VALIDITY.** The degree to which a measurement actually measures or detects what it is supposed to measure.
- **VARIABLE**. Any characteristic or attribute that can be measured.
- **VARIANCE.** A measure of the dispersion shown by a set of observations, defined by the sum of the squares of deviations from the mean, divided by the number of degrees of freedom in the set of observations.
- **VECTOR.** An animate intermediary in the indirect transmission of an agent that carries the agent from a reservoir to a susceptible host.
- **VEHICLE.** An inanimate intermediary in the indirect transmission of an agent that carries the agent from a reservoir to a susceptible host.
- **VIRULENCE.** The proportion of persons with clinical disease, who after becoming infected, become severely ill or die.
- **VITAL STATISTICS.** Systematically tabulated information about births, marriages, divorces, and deaths, based on registration of these vital events.

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- **YEARS OF POTENTIAL LIFE LOST.** A measure of the impact of premature mortality on a population, calculated as the sum of the differences between some predetermined minimum or desired life span and the age of death for individuals who died earlier than that predetermined age.

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- **ZOONOSES.** An infectious disease that is transmissible under normal conditions from animals to humans.

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Clinical Epidemiology & Evidence-Based Medicine Glossary:

Clinical Study Design and Methods Terminology

Updated August 22, 1999

Contents:

A. **Clinical Study Types:** (In order from strongest to weakest empirical evidence inherent to the design when properly executed.)
   1. **Experimental Studies:** The hallmark of the experimental study is that the allocation or assignment of individuals is under control of investigator and thus can be randomized. The key is that the investigator controls the assignment of the exposure or of the treatment but otherwise symmetry of potential unknown confounders is maintained through randomization. Properly executed experimental studies provide the strongest empirical evidence. The randomization also provides a better foundation for statistical procedures than do observational studies.
      a. **Randomized Controlled Clinical Trial (RCT):** A prospective, analytical, experimental study using primary data generated in the clinical environment. Individuals similar at the beginning are randomly allocated to two or more treatment groups and the outcomes the groups are compared after sufficient follow-up time. Properly executed, the RCT is the strongest evidence of the clinical efficacy of preventive and therapeutic procedures in the clinical setting.
      b. **Randomized Cross-Over Clinical Trial:** A prospective, analytical, experimental study using primary data generated in the clinical environment. Individuals with a chronic condition are randomly allocated to one of two treatment groups, and, after a sufficient treatment period and often a washout period, are switched to the other treatment for the same period. This design is susceptible to bias if carry over

effects from the first treatment occur. An important variant is the "N of One" clinical trial in which alternative treatments for a chronically affected individual are administered in a random sequence and the individual is observed in a double blind fashion to determine which treatment is the best.

c. **Randomized Controlled Laboratory Study:** A prospective, analytical, experimental study using primary data generated in the laboratory environment. Laboratory studies are very powerful tools for doing basic research because all extraneous factors other than those of interest can be controlled or accounted for (e. g., age, gender, genetics, nutrition, environment, co-morbidity, strain of infectious agent). However, this control of other factors is also the weakness of this type of study. Animals in the clinical environment have a wide range of all these controlled factors as well as others that are unknown. If any interactions occur between these factors and the outcome of interest, which is usually the case, the laboratory results are not directly applicable to the clinical setting unless the impact of these interactions are also investigated.

2. **Observational Studies:** The allocation or assignment of factors is not under control of investigator. In an observational study, the combinations are self-selected or are "experiments of nature". For those questions where it would be unethical to assign factors, investigators are limited to observational studies. Observational studies provide weaker empirical evidence than do experimental studies because of the potential for large confounding biases to be present when there is an unknown association between a factor and an outcome. The symmetry of unknown confounders cannot be maintained. The greatest value of these types of studies (e.g., case series, ecologic, case-control, cohort) is that they provide preliminary evidence that can be used as the basis for hypotheses in stronger experimental studies, such as randomized controlled trials.

   a. **Cohort (Incidence, Longitudinal Study) Study:** A prospective, analytical, observational study, based on data, usually primary, from a follow-up period of a group in which some have had, have or will have the exposure of interest, to determine the association between that exposure and an outcome. Cohort studies are susceptible to bias by differential loss to follow-up, the lack of control over risk assignment and thus confounder symmetry, and the potential for zero time bias when the cohort is assembled. Because of their prospective nature, cohort studies are stronger than case-control studies when well executed but they also are more expensive. Because of their observational nature, cohort studies do not provide empirical evidence that is as strong as that provided by properly executed randomized controlled clinical trials.

   b. **Case-Control Study:** A retrospective, analytical, observational study often based on secondary data in which the proportion of cases with a potential risk factor are compared to the proportion of controls (individuals without the disease) with the same risk factor. The common association measure for a case-control study is the odds ratio. These studies are commonly used for initial, inexpensive evaluation of risk factors and are particularly useful for rare conditions or for risk factors with long induction periods. Unfortunately, due to the potential for many forms of bias

in this study type, case control studies provide relatively weak empirical evidence even when properly executed.

c. **Ecologic (Aggregate) Study:** An observational analytical study based on aggregated secondary data. Aggregate data on risk factors and disease prevalence from different population groups is compared to identify associations. Because all data are aggregate at the group level, relationships at the individual level cannot be empirically determined but are rather inferred from the group level. Thus, because of the likelihood of an ecologic fallacy, this type of study provides weak empirical evidence.

d. **Cross-Sectional (Prevalence Study) Study:** A descriptive study of the relationship between diseases and other factors at one point in time (usually) in a defined population. Cross sectional studies lack any information on timing of exposure and outcome relationships and include only prevalent cases.

e. **Case Series:** A descriptive, observational study of a series of cases, typically describing the manifestations, clinical course, and prognosis of a condition. A case series provides weak empirical evidence because of the lack of comparability unless the findings are dramatically different from expectations. Case series are best used as a source of hypotheses for investigation by stronger study designs, leading some to suggest that the case series should be regarded as clinicians talking to researchers. Unfortunately, the case series is the most common study type in the clinical literature.

f. **Case Report:** Anecdotal evidence. A description of a single case, typically describing the manifestations, clinical course, and prognosis of that case. Due to the wide range of natural biologic variability in these aspects, a single case report provides little empirical evidence to the clinician. They do describe how others diagnosed and treated the condition and what the clinical outcome was.

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B. **Validity vs. Bias:**

1. **Validity:** Truth

a. **External Validity (Generalizability):** Truth beyond a study. A study is external valid if the study conclusions represent the truth for the population to which the results will be applied because both the study population and the reader s population are similar enough in important characteristics. The important characteristics are those that would be expected to have an impact on a study s results if they were different (e.g., age, previous disease history, disease severity, nutritional status, co-morbidity, ...). Whether or not the study is generalizable to the population of interest to the reader is a question only the reader can answer. External validity can occur only if the study is first internally valid.

   b. **Internal Validity:** Truth within a study. A study is internally valid if the study conclusions represent the truth for the individuals studied because the results were not likely due to the effects of chance, bias, or confounding because the study design, execution, and analysis were correct. The statistical assessment of the effects of chance is meaningless if sufficient bias has occurred to invalidate the study. All studies are flawed to some degree. The crucial question that the reader must answer is whether or not these problems were great enough that the study results are more likely due to the flaws than the hypothesis under investigation.
   c. **Symmetry Principle:** In a study, the principle of keeping all things between groups similar except for the treatment of interest. This means that the same instrument is used to measure each individual in each group, the observers know the same things about all individuals in all groups, randomization is used to obtain a similar allocation of individuals to each group, the groups are followed at the same time, ...

2. **Confounding:** Confounding is the distortion of the effect of one risk factor by the presence of another. Confounding occurs when another risk factor for a disease is also associated with the risk factor being studied but acts separately. Age, breed, gender and production levels are often confounding risk factors because animals with different values of these are often at different risk of disease. As a result of the association between the study and confounding risk factor, the confounder is not distributed randomly between the group with the study risk factor and the control group without the study factor. Confounding can be controlled by restriction, by matching on the confounding variable or by including it in the statistical analysis.

3. **Bias (Systematic Error):** Any process or effect at any stage of a study from its design to its execution to the application of information from the study, that produces results or conclusions that differ systematically from the truth. Bias can be reduced only by proper study design and execution and not by increasing sample size (which only increases precision by reducing the opportunity for random chance deviation from the truth). Almost all studies have bias, but to varying degrees. The critical question is whether or not the results could be due in large part to bias, thus making the conclusions invalid. Observational study designs are inherently more susceptible to bias than are experimental study designs.
   a. **Confounding Bias:** Systematic error due to the failure to account for the effect of one or more variables that are related to both the causal factor being studied and the outcome and are not distributed the same between the groups being studied. The different distribution of these "lurking" variables between groups alters the apparent relationship between the factor of interest and the outcome. Confounding can be accounted for if the confounding variables are measured and are included in the statistical models of the cause-effect relationships.
   b. **Ecological (Aggregation) Bias (Fallacy):** Systematic error that occurs when an association observed between variables representing group averages is mistakenly

taken to represent the actual association that exists between these variables for individuals. This bias occurs when the nature of the association at the individual level is different from the association observed at the group level. Data aggregated from individuals (e.g. census averages for a region) or proxy data from other sources (e.g., the amount of alcohol distributed in a region is a proxy for the amount of alcohol by individuals in that region) are often easier and less expensive to acquire than are data directly from individuals.

c. **Measurement Bias:** Systematic error that occurs when, because of the lack of blinding or related reasons such as diagnostic suspicion, the measurement methods (instrument, or observer of instrument) are consistently different between groups in the study.
    1. **Screening Bias:** The bias that occurs when the presence of a disease is detected earlier during its latent period by screening tests but the course of the disease is not be changed by earlier intervention. Because the survival after screening detection is longer than survival after detection of clinical signs, ineffective interventions appear to be effective unless they are compared appropriately in clinical trials.
d. **Reader Bias:** Systematic errors of interpretation made during inference by the user or reader of clinical information (papers, test results, ...). Such biases are due to clinical experience, tradition, credentials, prejudice and human nature. The human tendency is to accept information that supports pre-conceived opinions and to reject or trivialize that which does not support preconceived opinions or that which one does not understand. (JAMA 247:2533)
e. **Sampling (Selection) Biases:** Systematic error that occurs when, because of design and execution errors in sampling, selection, or allocation methods, the study comparisons are between groups that differ with respect to the outcome of interest for reasons other than those under study.
f. **Zero Time Bias:** The bias that occurs in a prospective study when individuals are found and enrolled in such a fashion that unintended systematic differences occur between groups at the beginning of the study (stage of disease, confounder distribution). Cohort studies are susceptible to zero-time bias if the cohort is not assembled properly.

4. **Bias Effect:**
    a. **Non-differential Bias:** Opportunities for bias are equivalent in all study groups, which biases the outcome measure of the study toward the null of no difference between the groups.
    b. **Differential Bias:** Opportunities for bias are different in different study groups, which biases the outcome measure of the study in unknown ways. Case-control studies are highly susceptible to this form of bias between the case and control groups.

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C. **Study Objective, Direction and Timing:**

1. **Analytic (Explanatory) Study:** The objective of an analytic study is to make causal inferences about the nature of hypothesized relationships between risk factors and outcomes. Statistical procedures are used to determine if a relationship was likely to have occurred by chance alone. Analytic studies usually compare two or more groups, such as case-control studies, cohort studies, randomized controlled clinical trials, and laboratory studies.
2. **Descriptive Study:** The objective of a descriptive study is to describe the distribution of variables in a group. Statistics serve only to describe the precision of those measurements or to make statistical inferences about the values in the population from which the sample was taken.
3. **Contemporary (Concurrent) Comparison:** Comparison is between two groups experiencing the risk factor or the treatment at the same time. Contemporary comparison has the major advantages that symmetry of unknown risk factors for the condition that change over time is maintained and that measurement procedures can be performed as similarly as possible on both groups.
4. **Historical (Non-concurrent) Comparison:** Comparison is of the same group or between groups at different times that are not experiencing the risk factor or the treatment at the same time. Historical comparison is often used to allow a group to serve as its own historical control or is done implicitly when a group is compared to expected standards of performance. This design provides weak evidence because symmetry isn t assured. It is very susceptible to bias by changes over time in uncontrollable, confounding risk factors, such as differences in climate, management practices and nutrition. Bias due to differences in measuring procedures over time may also account for observed differences.
5. **Prospective Study (Data):** Data collection and the events of interest occur after individuals are enrolled (e.g. clinical trials and cohort studies). This prospective collection enables the use of more solid, consistent criteria and avoids the potential biases of retrospective recall. Prospective studies are limited to those conditions that occur relatively frequently and to studies with relatively short follow-up periods so that sufficient numbers of eligible individuals can be enrolled and followed within a reasonable period.
6. **Retrospective Study (Data):** All events of interest have already occurred and data are generated from historical records (secondary data) and from recall (which may result in the presence of significant recall bias). Retrospective data is relatively inexpensive compared to prospective studies because of the use of available information and is typically used in case-control studies. Retrospective studies of rare conditions are much more efficient than prospective studies because individuals experiencing the rare outcome can be found in patient records rather than following a large number of individuals to find a few cases.

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D. **Other Terms:**

1. **Baseline:** Health state (disease severity, confounding conditions) of individuals at beginning of a prospective study. A difference (asymmetry) in the distributions of baseline values between groups will bias the results.
2. **Blinding (Masking):** Blinding is those methods to reduce bias by preventing observers and/or experimental subjects involved in an analytic study from knowing the hypothesis being investigated, the case-control classification, the assignment of individuals or groups, or the different treatments being provided. Blinding reduces bias by preserving symmetry in the observers measurements and assessments. This bias is usually not due to deliberate deception but is due to human nature and prior held beliefs about the area of study.
    1. **Placebo:** A placebo is the shame treatment used in a control group in place of the actual treatment. If a drug is being evaluated, the inactive vehicle or carrier is used alone so it is as similar as possible in appearance and in administration to the active drug. Placebos are used to blind observers and, for human trials, the patients to which group the patient is allocated.
3. **Case Definition:** The set of history, clinical signs and laboratory findings that are used to classify an individual as a case or not for an epidemiological study. Case definitions are needed to exclude individuals with the other conditions that occur at an endemic background rate in a population or other characteristics that will confuse or reduce the precision of a clinical study.
4. **Cohort:** A group of individuals identified on the basis of a common experience or characteristic that is usually monitored over time from the point of assembly.
5. **Experimental Unit, Unit of Concern (EU):** In an experiment, the experimental unit are the units that are randomly selected or allocated to a treatment and the unit upon which the sample size calculations and subsequent data analysis must be based. Experimental units are often a pen of animals or a cage of mice rather than the individuals themselves. Analyzing data on an individual basis when groups (herds, pens) have been the basis of random allocation is a serious error because it over-estimates precision, possibly biasing the study toward a false-positive conclusion.

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E. **Sample Selection / Allocation Procedures:**

1. **Matching:** When confounding cannot be controlled by randomization, individual cases are matched with individual controls that have similar confounding factors, such as age, to reduce the effect of the confounding factors on the association being investigated in analytic studies. Most commonly seen in case-control studies.

2. **Restriction (Specification):** Eligibility for entry into an analytic study is restricted to individuals within a certain range of values for a confounding factor, such as age, to reduce the effect of the confounding factor when it cannot be controlled by randomization. Restriction limits the external validity (generalizability) to those with the same confounder values.
3. **Census:** A sample that includes every individual in a population or group (e.g., entire herd, all known cases). A census not feasible when group is large relative to the costs of obtaining information from individuals.
4. **Haphazard, Convenience, Volunteer, Judgmental Sampling:** Any sampling not involving a truly random mechanism. A hallmark of this form of sampling is that the probability that a given individual will be in the sample is unknown before sampling;. The theoretical basis for statistical inference is lost and the result is inevitably biased in unknown ways. Despite their best intentions, humans cannot choose a sample in a random fashion without a formal randomizing mechanism.
5. **Consecutive (Quota) Sampling:** Sampling individuals with a given characteristic as they are presented until enough with that characteristic are acquired. This method is okay for descriptive studies but unfortunately not much better than haphazard sampling for analytical observational studies.
6. **Random Sampling:** Each individual in the group being sampled has a known probability of being included in the sample obtained from the group before the sampling occurs.
7. **Simple Random Sampling / Allocation:** Sampling conducted such that each eligible individual in the population has the **same** chance of being selected or allocated to a group. This sampling procedure is the basis of the simpler statistical analysis procedures applied to sample data. Simple random sampling has the disadvantage of requiring a complete list of identified individuals making up the population (the list frame) before the sampling can be done.
8. **Stratified Random Sampling:** The group from which the sample is to be taken is first stratified on the basis of a important characteristic related to the problem at hand (e.g., age, parity, weight) into subgroups such that each individual in a subgroup has the same probability of being included in the sample but the probabilities are different between the subgroups or strata. Stratified random sampling assures that the different categories of the characteristic that is the basis of the strata are sufficiently represented in the sample but the resulting data must be analyzed using more complicated statistical procedures (such as Mantel-Haenszel) in which the stratification is taken into account.
9. **Cluster Sampling:** Staged sampling in which a random sample of natural groupings of individuals (houses, herds, kennels, households, stables) are selected and then sampling all the individuals within the cluster. Cluster sampling requires special statistical methods for proper analysis of the data and is not advantageous if the individuals are highly correlated within a group (a strong herd effect).
10. **Systematic Sampling:** From a random start in first n individuals, sampling every n^{th} animal as they are presented at the sampling site (clinic, chute, ...). Systematic sampling will not produce a random sample if a cyclical pattern is present in the important characteristics of the individuals as they are presented. Systematic sampling has the

advantage of requiring only knowledge of the number of animals in the population to establish n and that anyone presenting the animals is blind to the sequence so they cannot bias it.

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Clinical Epidemiology & Evidence-Based Medicine Glossary:

Terminology Specific to Epidemiology

Updated July 02, 2005

Section Contents:

Disease, Outcome and Factor Measures:

A. **Proportion:** A dimensionless number between 0.0 an 1.0 (if a probability) or, equivalently, between 0% and 100% (if a percentage) consisting of one count as the numerator divided by another count as the denominator. Note that for consistent, unbiased interpretation, 1) all the individuals in the numerator must also be included in the denominator, 2) each individual in the denominator must be at risk of being in the numerator, and 3) all the individuals at risk of being in the numerator in a group must be in the denominator. Equivalently, the probability that an at-risk individual will acquire a condition. Point prevalence is a proportion. Proportions are often miss-identified as "rates" (e.g. case-fatality "rate", attack "rate", pregnancy "rate", relapse "rate"). (Note: Some introductory texts mislabel these proportions as "rates".)

B. **Rate:** An instantaneous or "velocity" measure that can range from 0.0 to infinity, has the dimensions of number of individuals per group - unit of time (e.g., 2.5 cases per dog-month), and is the number of individuals in the at-risk group that experience the event during one time unit (per hour, day, week, month, year, ...). A rate is a ratio of the number of events in a group of individuals at risk for the event divided by the total time units contributed by the individuals at-risk of the event and is not a proportion. Proportions are often miss-identified as "rates".

C. **Ratio:** A numerator divided by a denominator that usually does not include subjects of the numerator and is not restricted to values between 0.0 and 1.0 as are proportions.

D. **Incidence Rate:** The rate of onset of a disease in a population per unit time calculated as

the number of new cases in a population divided by the total time units each individual in the population was observed before either disease onset occurred in the individual or observation of the individual ceased. Theoretically, incidence is an instantaneous rate.

E. **Cumulative Incidence:** The proportion of a fixed population that become diseased within the stated time period (e.g. month, year); not a rate but often referred to as such (e.g. the annual incidence "rate" is actually the cumulative annual incidence, a proportion).
    1. **Attack "Rate":** The proportion of susceptible individuals exposed to a specific risk factor in a disease outbreak that become cases. For an infectious risk factor, the attack rate is the number of secondary cases occurring within the accepted incubation period divided by the number of susceptible individuals in a closed group exposed to the primary (index) case.
    2. **Case Fatality "Rate":** Cumulative incidence of death in the group of individuals that develop the disease over a time period (often unstated); a proportion, not a rate.
    3. **Mortality "Rate":** The proportion of individuals in a population that die in a given period of time, usually a year and usually multiplied by a 10^n population size so it is expressed as the number per 1,000, 10,000, 100,000, ... individuals per year. These proportions are often broken into cause-specific and age-specific proportions and are often standardized so different groups can be compared and the population at the middle of the time interval is often used as the denominator.

F. **Prevalence (Point) (Pr):** In the clinical setting, prevalence is the clinician s estimate of the probability that an individual has a given disease, based on what the clinician knows to that point (e.g., history, physical exam), before doing a diagnostic test. In the population sense, prevalence is the probability at a specific point in time that an individual randomly selected from a group will have the condition, which is equivalent to the proportion of animals in the group that have the disease. Group prevalence is calculated by dividing the number of individuals in a group that have this disease by the total number of individuals in the group that are at risk of the disease. Note that prevalence is a good measure of the amount of a chronic, low mortality disease in a population, but is not a good measure of the amount of short duration or high fatality disease. Prevalence is often established by cross-sectional surveys. However, note that the prevalence of test positives in a survey is equivalent to the actual disease prevalence only if the test used is a perfect test.

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Risk:

A. **Risk:** Risk is the likelihood, usually quantified as an incidence rate or cumulative incidence proportion, that an individual will develop a given disease in a given time period.
    1. **Risk Factor (Condition Determinant, Predisposing Factor):** An individual

attribute or exposure that is positively or negatively associated with the occurrence of a disease.

a. **Attribute:** Risk factor that is an intrinsic characteristic of the individual (e. g., genetic susceptibility, age, sex, breed, weight).
b. **Exposure:** Risk factor that is in the environment external to the individual (e.g., nutrition, housing, husbandry practice, or toxic agent).

2. **Competing Risks:** Other sets of risk factors than can cause the condition of interest which coexist with the set of factors of interest, that is; those things that cause "red herring" cases in outbreak investigations.
3. **Induction Period:** Time between exposure to a specific risk factor and the initiation of the disease. Generally the longer the induction period, the more difficult is the assessment of the association between the risk factor(s) and the disease and thus the evaluation of causality.
4. **Latent Period:** Time between biologic onset of disease and disease detection (clinical - appearance of clinical signs or subclinical - positive diagnostic tests).
5. **Risk (Key) Determinant:** A term applied to risk factors that a veterinarian can modify or eliminate in a specific situation to prevent or correct the disease.
6. **Risk Marker:** A non-causal factor associated sufficiently well with a risk factor that it can be used as a reliable marker, or indicator, of the risk factor s presence.

B. **Risk Measures:**

1. **Attributable Risk (AR):** The risk in the group exposed to a risk factor minus the risk in the group not exposed to that risk factor. The underlying or background risk without that exposure is usually assumed to be the same in both groups.
2. **Etiologic Fraction:** (Population attributable risk) The proportion of all cases of a disease that are attributable to an exposure or risk. This is the proportion of the disease in the population that would be eliminated if that exposure were eliminated or prevented.
3. **Relative Risk (RR):** A ratio ranging from 0 to infinity that indicates the strength of the association between the risk factor and the disease outcome and is calculated by dividing the risk in the group exposed to a risk factor by the risk in the unexposed group. A RR value statistically significantly larger than 1 indicates the exposure is associated with increased risk of disease, a RR value not statistically significantly different from 1 indicates there is no association between the exposure and the risk of disease, and a RR value statistically significantly less than 1 indicates the exposure is associated with decreased risk of disease; that is, the exposure is protective.
4. **Exposure Odds Ratio (OR):** An estimate of relative risk that is obtained from a case-control study and that is similar to the relative risk when the disease is relatively rare (a cumulative annual incidence of < 5% in the unexposed population). Otherwise, it over-estimates relative risk. The odds-ratio is interpreted in the same fashion as relative risk.
5. **Number Needed to Treat (NNT):** NNT is the number of individuals a clinician would need to treat to prevent one adverse outcome in that group of similar

individuals at risk of the problem. This measure establishes the benefit of an intervention compared to doing nothing against a disease in individuals at risk of that disease when adverse events would still be expected even with the intervention (e.g. daily aspirin to prevent myocardial infarction). NNT is the reciprocal of the attributable risk or the reciprocal of the difference between the proportions of treated and non-treated individuals experiencing events over some period of time.

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Causality:

A. **Association:** An association exists if two variables appear to be related by a mathematical relationship; that is, a change of one appears to be related to the change in the other. Association is necessary for a causal relationship to exist but **association alone does not prove that a causal relationship exists**. A correlation coefficient or the risk measures often quantify associations.
    1. **Negative Association (Inverse Relationship):** The magnitude of one variable appears to move in the opposite direction of the other associated variable. The correlation coefficient is negative and, if the relationship is causal, higher levels of the risk factor are protective against the outcome.
    2. **Positive Association (Direct Relationship):** The magnitudes of both variables appear to move together up or down. The correlation coefficient is positive and, if the relationship is causal, higher levels of the risk factor cause more of the outcome.
B. **Cause:** The combination of necessary and sufficient factors (e.g., attributes and exposures) the presence of which, alone or in combination, at some time during an individual s life, inevitably result in disease in that individual.
    1. **Causal Pathway (Causal Web, Cause and Effect Relationships):** The actions of risk factors acting individually, in sequence, or together that result in disease in an individual. These pathways are often different with different sets of risk factors for individuals in different situations. Understanding these pathways and their differences is necessary to devise effective preventive or corrective measures (interventions) for a specific situation. What is effective in one pathway may not be in another because of the differences in the component risk factors. (e.g., bronchopneumonia in a housed calf vs. in a feedlot calf).
    2. **Etiology:** The study of disease causes and their modes of operation.
    3. **Necessary Cause:** A risk factor that must be, or have been, present for the disease to occur (e.g., a specific infectious agent for a particular infectious disease). Although necessary, few infectious agents cause disease by themselves.
    4. **Sufficient Cause:** The minimal combination of risk factors acting on the individual, on the etiologic agent if one is involved, or in the environment whose

occurrence in an individual s life inevitably results in disease. A disease can often be caused by more than one set of sufficient causes and thus different causal pathways for individuals contracting the disease in different situations.

C. **Henle-Koch Postulates:** (1877) A set of 4 criteria to be met before the relationship between a particular infectious agent and a particular disease is accepted as causal. These postulates enabled the germ theory of disease to achieve dominance in medicine over other theories, such as humors and miasma. They are insufficient for multi-causal and non-infectious diseases because the postulates presume that an infectious agent is both necessary and sufficient cause for a disease. Fulfilling the postulates experimentally can be surprisingly difficult, even when the infectious process is thought to be well understood. Now archaic and superseded by the Hill's-Evans Postulates.

D. **Hill-Evans Postulates:** (1965) A set of 9 or 10 criteria (depending on interpretation of original papers) that each contribute a different amount of strength to the likelihood that a relationship between a potential risk factor and a disease is causal. The entire set constitutes very strong evidence of causality when fulfilled. As noted above, these supersede the Henle-Koch Postulates and are extensions of Mill s Five Methods of Inductive Inference for discovering causal relationships.

1. **Mill's Eliminative Methods of Induction (System of Logic, 1843):**
    a. **Method of Agreement:** "If two or more instances of the phenomenon have only one circumstance in common, the circumstance in which alone all instances agree is the cause or effect of the given phenomenon."
    b. **Method of Difference:** "If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring in the former, the circumstance in which alone the two instances differ, is the effect, or the cause, or an indispensable part of the cause, of the phenomenon."
    c. **Method of Residues:** "Subduct from any phenomenon such part as is known by previous inductions to be the effect of certain antecedents, and the residue of the phenomenon is the effect of the remaining antecedents."
    d. **Method of Concomitant Variations**: "Whatever phenomenon varies in any manner whenever another phenomenon varies in some particular manner, is either a cause or an effect of that phenomenon, or is connected with it through some fact of causation."
2. **Hill's Criteria of Causation (1965):**
    a. **Strength of Association:** The larger the relative effect, the more likely the causal role of the factor.
    b. **Dose-response:** If the risk increases with increasing dose of the risk factor, the more likely the causal role of the factor.
    c. **Consistency:** If similar associations are found in different studies in different populations, the more likely the causal role of the factor.
    d. **Temporality:** Risk factor exposure must precede the outcome.
    e. **Intervention:** Reduction or removal of the risk factor must reduce the risk of the outcome.

f. **Biological Plausibility**
g. **Coherence**: Associations between the risk factor and the outcome must be consistent with existing knowledge.

3. **Evan's Postulates (1976):**
   a. Prevalence of the disease should be significantly higher in those exposed to the risk factor than those not.
   b. Exposure to the risk factor should be more frequent among those with the disease than those without.
   c. In prospective studies, the incidence of the disease should be higher in those exposed to the risk factor than those not.
   d. The disease should follow exposure to the risk factor with a normal or log-normal distribution of incubation periods.
   e. A spectrum of host responses along a logical biological gradient from mild to severe should follow exposure to the risk factor.
   f. A measurable host response should follow exposure to the risk factor in those lacking this response before exposure or should increase in those with this response before exposure. This response should be infrequent in those not exposed to the risk factor.
   g. In experiments, the disease should occur more frequently in those exposed to the risk factor than in controls not exposed.
   h. Reduction or elimination of the risk factor should reduce the risk of the disease.
   i. Modifying or preventing the host response should decrease or eliminate the disease.
   j. All findings should make biological and epidemiological sense.

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CPCP: Community Patient Care Preceptorship

Welcome to Module 4: Disease Prevention. Be sure to start by reading the **Introduction** and **Learning Objectives**. All components of this module are due **May 19, 2006**.

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COST BARRIERS

Virtual Patient Scenarios

A 36-year old woman comes to your booth at the health fair at her church to have her cholesterol checked. The reading is 283. After you inform her of the results, she indicates an interest in doing something about this, but is concerned that she can't afford medication to lower her cholesterol. A. Aside from recommending that this woman seek advice from her regular physician, what advice can you provide her today that might be effective in helping her lower her cholesterol value? B. What else might she do to lower her overall cardiovascular risk? C. What low-cost pharmacologic options might her primary care physician mention to lower her cholesterol?

ANSWER

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OVERCOMING SYSTEM-LEVEL BARRIERS TO PREVENTION

Virtual Patient Scenarios

You are finishing a hectic day in primary care clinic and are seeing your last patient who is here to establish care. He is a 58-year-old retired mechanic with diabetes mellitus, hypertension, a previous heart attack, obstructive sleep apnea, and depression. He is obese; his blood pressure is 155/98, he has leg swelling and a cellulitis. You develop a plan to address his many chronic problems but realize after he has left that you have forgotten to address several aspects of routine health maintenance including colorectal cancer screening, previous immunization with tetanus, influenza, and pneumococcal vaccines, and lipid profile assessment. To avoid similar mistakes with future patients, what things can you do to ensure that individuals under your care will receive recommended preventive services?

ANSWER

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Cardiovascular Disease:

The American Heart Association

This site has information on warning signs, diseases and conditions (arrhythmia, cholesterol, diabetes, heart attack, chronic heart failure, hypertension, etc.), advocacy, events, news and publications. The site also provides information for women and children and information in Spanish.

American Heart Association Site for Professionals

The Heart Profilers

This site from the American Heart Association. Provides information about strokes, and also a personalized profile that relays information about heart disease and other issues. Other topics include high blood pressure and cholesterol. This site has links for children and links in Spanish.

MedlinePlus: Heart Diseases

This NIH site provides an abundance of resources with links to information on the latest news, treatments, clinical trials, prevention and screening, and research. This complete site also provides links for diagnosis and symptoms, specific conditions, rehabilitation, genetics, organizations, statistics and links to sites for men, women, children, and seniors.

CDC –Chronic Disease Programs: Heart Disease

Fact Sheets and at a Glance Reports

National Center for Health Statistics - FASTATS

State Fact Sheets about Heart Disease Among Men

State Fact Sheets about Heart Disease Among Women

National Heart Lung and Blood Institute

This site has information for patients, professionals and researchers. The information on this site includes clinical practice guidelines for asthma, cholesterol, hypertension, obesity, and other conditions. The site also has information for funding, training, policies, clinical trials, networks and outreach and news and events.

Texas Heart Institute – Heart Information Center

This site provides educational information related to the prevention, diagnosis and treatment of cardiovascular disease.

The National Women's Health Information Center

A site by the U.S. Department of Health and Human Services. This site presents FAQ's and Fact Sheets on Heart issues for women.

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Cancer:

Oncolink: Abramson Cancer Center of the University of Pennsylvania

This site provides information on the types of cancer, treatment options, clinical trials, news, CME activities and links to other cancer resources.

American Cancer Society

This complete site has information for professionals and patients. Information for professionals include facts and figures, statistics, prevention and early detection, publications, medical updates, media information, research programs and jobs. The site also includes a **bookstore** with books for patients, family and friends; medical and clinical journals; and books for healthcare professionals. Asian Language materials as well as information in Spanish provided.

National Cancer Institute

This U.S. National Institutes of Health site provides information on the types of cancer (list A to Z), Clinical Trials, statistics, treatment, prevention, genetics, causes, screening and testing, research and funding, news, and a **Physician Data Query - PDQ®.** The PDQ® is an NCI database that provides the latest information on all the cancer topics listed above. Information is also available in Spanish.

Canadian Cancer Society

Information on this site is available in English or French. Information includes clinical trials, statistics, media releases, risk reduction, publications, hair donations, and a **cancer glossary.**

Medline Plus: Cancer

This site from the National Institutes of Health – NIH provides links to information on latest news, diagnosis and symptoms, treatment, clinical trials, alternative therapy, specific conditions, prevention and screening, nutrition, disease management, research, genetics, law and policy and statistics. The site also has specific information for men, children and seniors.

Cancer News

The latest news and information on diagnosis, treatments

and prevention. In addition to cancer updates, this site also provides links to other cancer resources.

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Children and Adolescents:

4 Girls Health

A site by the National Women's Health Information Center, a Division of the Department of Health and Human Services. This site encourages adolescent girls ages 10-16 to choose and adopt healthy behaviors. Information is available on fitness, nutrition, stress management, peer pressure, bullying, suicide, drugs/alcohol/smoking, self-esteem and other topics. Resources are available for parents and caregivers as well as educators. The site is interactive and user friendly and offers free gifts.

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Nutrition & Exercise:

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5 A Day Campaign

From the Centers for Disease Control and Prevention, this is a "5 A Day" campaign to promote ways to include the required 5 to 9 servings of fruit and vegetables into your mealtime. The site has information for patients including serving size descriptions, fast ways to get your "5 A Day", affordable ways to get your "5 A Day" as well as recipes.

Delicious Decisions

From the American Heart Association – this is a very useful and healthy cookbook. It shows how delicious can also be nutritious and it also provides information on how to achieve a well balanced diet; smart food shopping, including how to read food labels; eating out healthy; snacking and exercise.

Fitness Center – Just Move

Very good website from the American Heart Association with general health and exercise information. Provides links to other health resources, and a nice exercise log.

Kids Health for Parents

This site provides information on fitness and nutrition for children, especially for picky eaters. This site also provides fitness information on how to encourage children who hate sports to play outside.

NEW!!! Dietary Guidelines for Americans 2005

Dietary Guidelines for Americans is published jointly every 5 years by the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA). The *Guidelines* provide authoritative advice for people two years and older about how good dietary habits can promote health and reduce risk for major chronic diseases.

This site provides brochures and media and audio files. Resources to other Nutrition sites are also provided.

Dietary Guide for Americans 2005 PDF file (4.2MB)

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Diabetes:

American Diabetes Association

This site provides great information on type 1 and type 2 diabetes, gestational diabetes, and pre-diabetes. It provides the signs and symptoms of diabetes and a diabetes risk test. This site is great for diabetes prevention as it provides nutrition and recipes as well as weight loss and exercise information. Information is also available for health professionals and scientists that cover recommendations, research, advocacy, community programs, and meetings. Information is available for children and parents and is also available in Spanish.

Diabetes

A journal of the American Diabetes Association.

National Institute of Diabetes & Digestive & Kidney Diseases

From the National Institutes of Health – this site provides health information and recommendations; information on research and funding; reports, testimony & plans; education programs; participating laboratories and clinical research.

Diabetes Public Health Resource

This site is from the CDC and provides information on conferences, diabetes care and prevention. Information is also available for publications and products as well as statistics and trends – **Diabetes at a Glance**.

Juvenile Diabetes Research Foundation

This site gives updates on juvenile diabetes research, publications and legislative actions. A **Kids Online** resource provides information on living with diabetes.

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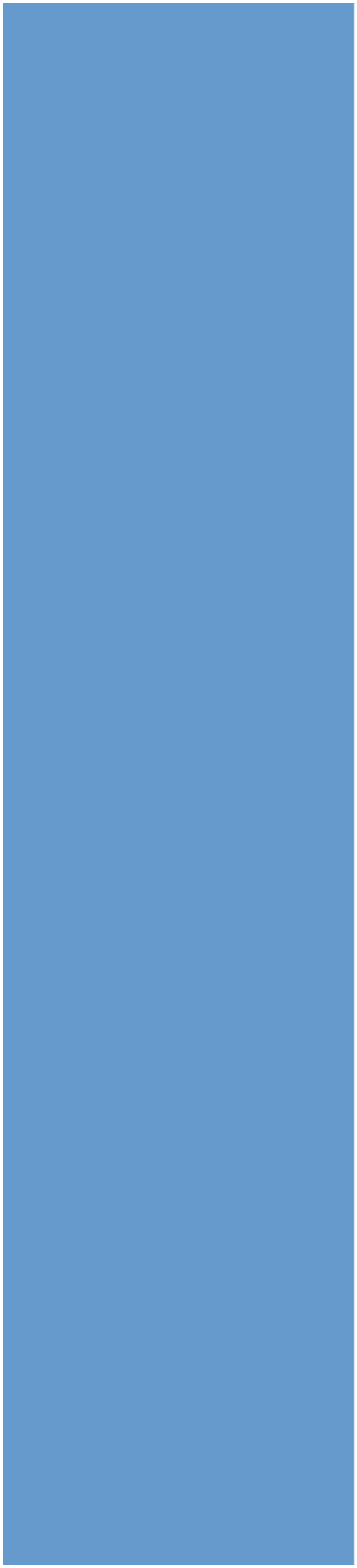

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Lung Diseases:

American Lung Association

This site has information on Lung Diseases including emphysema, cancer, COPD, asthma, Tuberculosis and many more. Information is also available on environmental factors such as tobacco, air quality and filters, anthrax, and others. The information is also available in Spanish.

National Heart, Lung and Blood Institute (NHLBI) – Lung Diseases Information

This site provides information on several diseases and conditions affecting the Lungs. Information for professionals cover topics such as asthma, information for schools and child care centers, asthma education and prevention, publications, educational tutorials, research, news and events. The site provides publications and fact sheets on asthma, acute respiratory disease syndrome (ARDS), bronchopulmonary dysplasia, pulmonary arterial hypertension, sarcoidosis, and more.

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Health Care for the Elderly:

American Geriatrics Society

A great site for health and aging. This site provides news, education for professionals and patients, funding opportunities, information on guidelines and position statements, geriatrics-for-specialists initiative information, publications, public policy updates, and job information for the elderly. The site also has information on Health Care systems for the elderly.

Life Clinic

Really informative site for elderly care with advice on everything from financial matters to diet and health. The site also provides a "Senior care tracking" link that tracks and records information such as food diaries, exercise, cholesterol and weight. Information for professionals include topics in hypertension, patient pamphlets, web site reviews, free publications, book reviews and news.

Elderly Health Services

A great website with information for health problems of the Elderly, Healthy Lifestyle tips, self-help tips, and career information. This site also has links to publications, videos, resources for providers of Elderly Services, and health education kits. Information also available in Traditional Chinese.

Health and Age

Website on "healthy aging". This website is managed by a group of doctors and provides information for the elderly as well as their caregivers. This site also provides information on news, articles, disease prevention.

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Hypertension & Stroke:

National High Blood Pressure Education Program (NHBPEP) Home Page

* **NHBPEP - Information for Health Professionals**.

This site provides information on heart and vascular diseases, blood diseases, lung diseases and sleep disorders. The site has information for patients, professionals and researchers including clinical practice guidelines for asthma, cholesterol, hypertension, obesity, and other conditions. The site also has information for funding, training, policies, clinical trials, networks and outreach and news and events. Also has information for special audiences: African Americans, Asian Americans and Pacific Islanders, Children/ Parents/Teachers, Latinos, Native American/Alaska Natives, and women.

This site is from the National Heart Lung and Blood Institute (NHLBI)

JNC 7 – The Full Report

JNC 7 Express

JNC 7 - Supplements

JNC 7 Full Report, JNC 7 Express, Blood Pressure Wallet Card, Facts about the DASH eating Plan, 4th Report on high blood pressure in children and adolescents, applications for PALM OS and Pocket PC's, physician reference card, slide show, press release and media kit.

MedlinePlus: High Blood Pressure

This NIH site provides an abundance of resources with links to information on the latest news, disease management, clinical trials, prevention and screening, and research. This complete site also provides links for diagnosis and

symptoms, specific conditions, rehabilitation, genetics, organizations, statistics and links to sites for men, women, children, teenagers and seniors.

American Society of Hypertension (ASH)

ASH is the largest U.S. organization dedicated exclusively tot hypertension and related diseases. This site provides guidelines, research, statistics and information on treatments and drugs. The site also gives news, publications, CME activities and the organization provides membership benefits.

International Society on Hypertension in Blacks (ISHIB)

This site has is dedicated to improving the health of ethnic minority populations. It provides information on ethnicity and disease, community outreach, education, CME activities. This site also provides information on guidelines and management of hypertension specific to African Americans, and also has membership benefits.

The American Stroke Association

This site provides information about stroke warning signs, care and programs. It also provides information for conferences, educational resources, scientific advisories and research for clinicians.

MedlinePlus: Stroke

This NIH site provides an abundance of resources with links to information on the latest news, disease management, clinical trials, prevention and screening, and research. This complete site also provides links for diagnosis and symptoms, specific conditions, rehabilitation, genetics, organizations, and statistics.

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Prevention for Migrant/Seasonal Workers:

National Center for Farmworker Health, Inc.

This site provides information for education on migrant health management, including Health Center Management, Midwest Farmworker Stream Forum, Patient Care, Provider Network Resources, and SCHIP and Medicaid Policies. The site also provides network support links to migrant health newsline, farmworker news, job bank and a directory of centers.

New Mexico Governor's Task Force on HIV/AIDS

Position Statement: United States/Mexico Border Health and Migrant/Seasonal Farm Workers. This document gives a background, provides recommendations, additional prevention information and some other useful tips.

U.S. Department of Labor

This site provides rules and regulations for Migrant and Seasonal Workers Protection Act (MSPA)

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Prevention for Latinos:

Delicious Heart Healthy Latino Recipes

From the National Heart Lung and Blood Institute, an informative site with several recommendations for Latinos for heart healthy recipes and meal preparation. This site also contains information in Spanish on blood pressure, cholesterol, smoking, and other related heart issues.

Cookbook PDF - *Platillos LatinosiSabrosos y Saludables!*

E recetas latinas, de buen sabor y saludables para el corazón. Estas recetas son las favoritas de las familias de latinos que trabajan en el proyecto Salud para su Corazón.

Medline PLUS – Hispanic American Health

Medline's site for Hispanic health and disease prevention. The site provides links to news, specific conditions, prevention and screening, research, organizations, statistics, women, children, and seniors.

Salud de los hispanoamericanos. Últimas noticias, Condiciones específicas, Nutrición, Asuntos relacionados, Investigaciones, Directorios, Estadísticas, Mujeres, Adolescentes, Información de la enciclopedia médica

Links to Information for Healthcare Providers and Patients

This site has numerous links to sites that provide information on various health issues in Spanish.

Agency for Healthcare Research and Quality (AHRQ)

This site provides a list of consumer materials in Spanish by the Agency for Healthcare Research and Quality (AHRQ). An English equivalent title is under each Spanish title.

*Los siguientes son los títulos de las publicaciones disponibles en español. Estos materiales fueron desarrollados por la Agency for Healthcare Research and Quality. Los títulos aparecen en orden alfabético y están vinculados con las publicaciones. **PDF Ayuda**.*

NHLBI, Latino Cardiovascular Health

Salud para su Corazón (For the Health of Your Heart) is an exciting new and comprehensive community-based heart-health promotion initiative from the National Heart, Lung, and Blood Institute. It targets Latinos living in the United States. The project raises awareness of the risk factors and promotes lifestyle changes to reduce the chances of developing heart disease. Salud para su Corazón offers many educational materials in English and Spanish for the general public and community health planners.

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Women's Health:

National Women's Health Information Center (NWHIC)

A site from the U.S. Department of Health and Human Services. This site provides information on educational campaigns with special sections on topics such as breastfeeding, body image, heart health, HIV/AIDS, menopause, violence and many more. The site also covers news, research, provides important resources for women and information are available in Spanish and in Chinese.

National Women's Health Resource Center

A site for women with information on health news, health reports, healthy lifestyles, and more. This site has comprehensive information on women's health topics and also provides some information and links to resources in Spanish.

OBGYN.net

This site provides information for medical professionals, medical industry and also global information on women's health issues. The site has various resources for education and symposiums, featured articles and audio and video presentations.

CDC Health Topic – Women's Health

This site provides links to health and safety topics, publication and products, data and statistics, and conferences and events.

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Other Prevention Sites:

Put Prevention into Practice (PPIP)

"A program to increase the appropriate use of clinical preventive services, such as screening tests, immunizations, and counseling, based on U.S. Preventive Services Task Force recommendations"

Clinical Preventive Services Recommended by the U.S. Preventive Services Task Force (USPSTF)

Adult Health Risk Profile

Patient Reminder Postcard

Reference Materials for Clinicians

- Third U.S. Preventive Services Task Force **Recommendations and Rationale**
- **Summaries of the Evidence** for the Third U.S. Preventive Services Task Force
- ***Guide to Clinical Preventive Services***, 2006
- ***Clinician's Handbook of Preventive Services***
- ***Guide to Community Preventive Services*** (coordinated by the Centers for Disease Control and Prevention)

Clinician's Handbook of Preventive Services, 2nd Edition, 1998

Centers for Disease Control and Prevention (CDC)

A leading federal agency for protecting the health and safety of people - at home and abroad. The CDC provides

information to enhance health decisions, and promote health through strong partnerships. It serves as the national focus for developing and applying disease prevention and control, environmental health, and health promotion and education activities designed to improve the health of the people of the United States.

Epocrates – Medical References

Guide to drugs, diseases and diagnoses. Also available for PALM and Pocket PC.

Healthfinder

Health Library

Healthweb

Mayo Clinic

MEDEM

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MEDLINEplus

The World's Largest Medical Library from the National Library of Medicine and the National Institutes of Health.

NOAH: New York Online Access to Health

National Library of Medicine (NLM)

National Institutes of Health

NECON

The New England Coalition for Health Promotion and Disease Prevention.

NECON is a coalition of the New England state health departments, the region's schools of public health and

federal health agencies led by Region I of the U.S. Department of Health & Human Services, as well as educators, legislators and representatives from industry, labor, and voluntary associations. Its mission is to serve as a vehicle for the development and enhancement of disease prevention and health promotion public policies in New England.

University of North Carolina Center for Health Promotion and Disease Prevention

The Center for Health Promotion and Disease Prevention at the University of North Carolina at Chapel Hill (HPDP), a research center focusing on population health issues, is committed to improving the health of the people of North Carolina and the southeast through interdisciplinary research, teaching and public service. Particular emphasis is paid to the needs of vulnerable and disadvantaged populations.

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Clinician Resources

CLINICIAN RESOURCES

Interventions to Improve the Delivery of Preventive Services:

Stange KC, Goodwin MA, Zyzanski SJ, Dietrich AJ. **Sustainability of a practice-individualized preventive service delivery intervention**. *Am J Prev Med.* 2003;25:296-300

Pub Med: ***Abstract***

Stone EG, Morton SC, Hulscher ME, Maglione MA, Roth EA, Grimshaw JM, Mittman BS, Rubenstein LV, Rubenstein LZ, Shekelle PG. **Interventions that increase use of adult immunization and cancer screening services: A meta-analysis.** *Ann Intern Med* 2002;136:641-651

Pub Med: ***Abstract***

Full Text Article

Summaries for Patient

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PATIENT RESOURCES

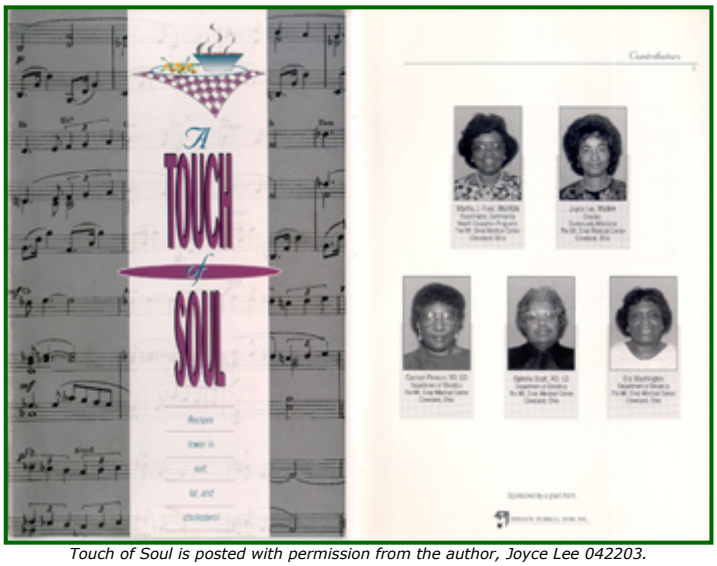
A Touch of Soul:

Click on the image to open a PDF file of this book.
Recipes can be printed from the PDF version.

A TOUCH OF SOUL

Recipes lower in salt, fat, and cholesterol

Martha J. Frost, RN/BSN
Joyce Lee, RN/MA
Carolyn Penson, RD, LD
Ophelia Scott, RD, LD
Ora Washington



Touch of Soul is posted with permission from the author, Joyce Lee 042203.

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PATIENT RESOURCES

Nutrition & Exercise:

Recipes

Delicious recipes for better health from the American Heart Association

Fitness

From the American Heart Association –Just Move. This fitness center site includes exercise diary, fitness recommendations and other fitness resources.

Health Facts

From the American Heart Association. Health Facts. This site includes a wealth of information on health and fitness:

What is your waist to hip ratio and why is this important

How to find your Body Mass Index (BMI)

Children's need for physical activity

Fitting in Fitness

How to keep track of exercise and diet

Workout Quiz

Healthy Heart Workout Quiz! From the American Heart Association

Diet and Fitness Tools

Tools for diet and fitness from the American Cancer Society. Calculate your BMI, Calculate your daily calorie needs and a Nutrition and Activity Quiz!

Diet and Nutrition

From the Centers for Disease Control and Prevention, this is a "5 A Day" campaign to promote ways to include the required 5 to 9 servings of fruit and vegetables into your mealtime. The site included information for patients including serving size descriptions, fast ways to get your "5 A Day", affordable ways to

get your "5 A Day" and recipes.

Healthy Cookbook

Useful, healthy cookbook. General information about well-being and healthy eating. Users have the option to enter preferences, for example low-salt or Italian. Large variety of recipes.

Healthy Recipes and Diet Tips

The magazine *Good Housekeeping's* online site. Very informative, with more diet tips and good healthy recipes. This site takes the "how to cook healthy for your family" approach.

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PATIENT RESOURCES

Heart Disease, Diabetes & Hypertension:

Shape your Family History Tree
(*login required*)

Shape your family history tree to find out if you are at risk for diabetes and heart disease. (*Login required*). From the American Heart Association

Healthy Heart Tracker
(*login required*)

The Heart Healthy Tracker can be used to log your glucose, cholesterol or blood pressure numbers from any Web browser anywhere, any time. You choose how often to enter your data: every day, once a week or monthly. When it's time for your next medical appointment, print out and take your data and corresponding graphs showing your improvement. (*Login required*). From the American Heart Association.

DASH Eating Plan

The DASH eating plan. Dietary Approaches to Stop Hypertension

Revised 01/27/06.
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PATIENT RESOURCES

Cancer:

Cancer Prevention Tips

Cancer Prevention. Sun safety, tobacco, and cancer prevention and detection programs. From the American Cancer Society.

Cancer Screening

Exams and test descriptions from the American Cancer Society.

Breast Cancer Quiz

Breast cancer quiz!

Monthly Self Examination

Your monthly breast self examination.

Healthy Diet for Cancer Prevention

An interesting site for cancer patients. It recommends foods and recipes that are beneficial for a cancer patient. Takes a "You are what you eat" approach and applies it here. Also has information on how foods fight toxins and cancer.

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Children and Adolescents:

4 Girls Health

A site by the National Women's Health Information Center, a Division of the Department of Health and Human Services. This site encourages adolescent girls ages 10-16 to choose and adopt healthy behaviors. Information is available on fitness, nutrition, stress management, peer pressure, bullying, suicide, drugs/alcohol/smoking, self-esteem and other topics. Resources are available for parents and caregivers as well as educators. The site is interactive and user friendly and offers free gifts.

Revised 01/27/06.
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Other Prevention Sites:

NECON

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Introduction

Cardiovascular disease (CVD) is the single leading cause of death in American women, surpassing the combined mortality from cancer, COPD, Alzheimer's disease and pneumonia. This is a category that encompasses coronary heart disease (CHD), accounting for the greatest number of fatalities, along with stroke, congestive heart failure, hypertension, rheumatic heart disease, congenital defects and peripheral vascular disease.

Historically, CVD has been misperceived as a condition that primarily affects men, underestimating the immense toll it has taken on women worldwide. The lack of awareness not only permeates the general community, but exists among medical providers as well. A 1995 Gallup poll revealed that 1 in 3 primary care physicians were not aware that heart disease was the number one cause of death in women[4]. Consequently, physicians often make different decisions for women's cardiovascular health than for men. This was aptly pointed out in a 1999 NEJM study by Schulman et al, revealing that physicians were less likely to recommend cardiac catheterization for women than for men when they were being evaluated for similar symptoms of chest pain[3].

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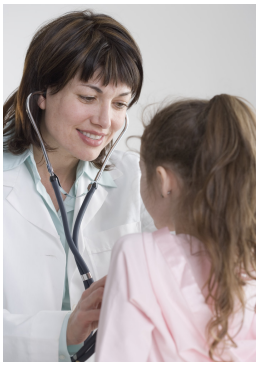
CHILDHOOD IMMUNIZATIONS

Introduction

Routine Childhood Immunizations



Vaccines are a well known example of primary prevention. They are considered to be one of the most successful public health initiatives of the 20th century. Prior to the advent of vaccines, vaccine-preventable diseases were a major cause of morbidity and mortality [1]. Currently in the United States, children are vaccinated against 11 diseases: Hepatitis B, diphtheria, tetanus, pertussis, *H. influenzae* type B, measles, mumps, rubella, varicella, *S. pneumoniae*, and influenza.

Except for influenza, these immunizations are usually given at well-child appointments during the first 2 years of life [2]. The influenza vaccine is given after 6 months of age and is given on an annual basis. This vaccine is reformulated yearly, based on the virus strains that are predicted to be active during the upcoming influenza season (October through March) [3].

Every January, the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians issue an updated national immunization schedule, which incorporates any new recommendations or vaccines

Recommended Childhood and Adolescent Immunization Schedule United States.

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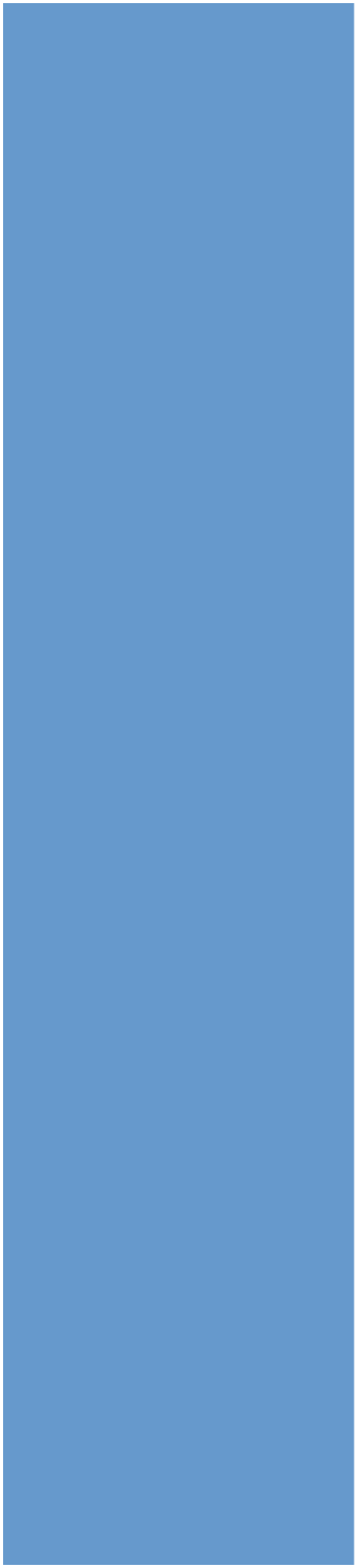

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Breast Cancer

Introduction

Breast cancer has become the most common cancer among women in the United States, excluding skin cancers, and the second leading cause of cancer death among North American women. Screening for breast cancer and breast cancer prevention has important and measurable effects on the morbidity and mortality associated with breast cancer.

Physicians have important roles in communicating the options, risks and benefits, and potential outcomes of these procedures and interventions. Applying accepted screening recommendations and prevention strategies allows physicians to help their patients reduce their risk of developing breast cancer, increase breast cancer detection at an early stage, and improve clinical outcomes.

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PREVENTION – OBESITY PREVENTION

Introduction

66% of the US population is classified as being overweight or obese. This means that less than ½ of all Americans are at a health weight. Over the past 40 years the **prevalence of obesity among Americans has more than doubled**. Children and teens are not spared by this problem with the percentage of overweight children more than tripling in the past 30 years.

Diagnosis of overweight or obesity is based upon the BMI. The BMI is a rough estimate of body fat percentage. In studies it has been found to have roughly a correlation. However in some individuals, particularly athletes, it may overestimate body fat and label a fit individual as overweight or obese. The accuracy of BMI with actual body fat percentage also varies between sexes and across age groups and ethnicities.[1] There are various other techniques utilized to calculate body fat including skin-fold thickness, bioelectrical impedance, and DEXA scans; however the BMI is the quickest, easiest and most cost effective method.

Overweight is defined as a body mass index (BMI) of 25 to 29.9 kg/ m² and **obesity** as a BMI of 30 kg/ m². Obesity has been divided into 3 categories: class I (BMI 30-34.9), class II (BMI 35-39.9), and class III (BMI >/= 40).

Classification	BMI (kg/ m2)
Underweight	18.5 or less
Healthy Weight	18.5-24.9
Overweight	25-29.9
Obese	
Class I	30-34.9
Class II	35-39.9
Class III	40 or more

In children the definition of overweight is based upon percentiles. Overweight children are those with a BMI at or above the 95th percentile for their age and sex. Those in the 85th-95th percentile are considered to be at risk for obesity. The use of percentiles is to account for varying body fat throughout different ages and between sexes.

Classification	Percentile
Underweight	Less than 5th
Healthy Weight	5th – 85th
At Risk of Overweight	85th – 95th
Overweight	95th or greater

Many online calculators and charts exist for BMI calculation.
Adult BMI Calculator
Child and Teen BMI Percentile Calculator

Not only is the amount of body fat important for determining health risks but so is the distribution of body fat. High abdominal circumferences is an individual risk predictor in individuals with normal BMI or slightly overweight. Increased abdominal circumference is associated with an increased risk of DM2, hypertension, dyslipidemia, and cardiovascular disease. In older individuals and Asian Americans waist circumference has shown to be a better indicator of relative disease compared to BMI.[2] Normal values for abdominal circumference are less than 40 inches in men and less than 35 inches in women.

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CEREBRAL ANEURYSMS

Introduction

Background:

Cerebral aneurysm rupture is a particularly devastating cause of neurological morbidity and mortality in the United States and throughout the world. The incidence of cerebral aneurysm varies from 1-6% depending upon the study, but a recent paper published in the New England Journal of Medicine looking at incidental findings on brain MRI found a 1.8% incidence of unruptured aneurysms in the general population[20]. The prevalence of aneurysms found on autopsy is approximately 0.2%-7.9% depending upon the methods used to detect the aneurysms[1]. In addition, aneurysms are multiple in 10-30% of all cases[2]. The female to male ratio is approximately 5:1, though this increased to 11:1 when considering patients with 3 or more aneurysms[2].

Aneurysms present in a multitude of ways, but presentation profiles may be divided between those that have ruptured and those which are unruptured. Unruptured aneurysms include those aneurysms which are asymptomatic and incidentally found on imaging, those which manifest with focal neurological deficits due to compression of the brain stem or cranial nerves, those which present with seizure due to encephalomalacia of surrounding brain parenchyma, those which present with sentinel hemorrhage, and those which present with headache[1,2]. Ruptured aneurysms present with subarachnoid hemorrhage, causing the so-called "worst headache of ones life."

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Does Preventive Care Save Money? Health Economics and the Presidential Candidates

Joshua T. Cohen, Ph.D., Peter J. Neumann, Sc.D., and Milton C. Weinstein, Ph.D.

Since this article has no abstract, we have provided an extract of the first 100 words of the full text and any section headings.

With health care once again a leading issue in a presidential race, candidates have offered plans for controlling spiraling costs while enhancing the quality of care. A popular component of such plans involves greater promotion of preventive health measures. The first element in Hillary Clinton's plan is to "focus on prevention: wellness not sickness." John Edwards has stated that "study after study shows that primary and preventive care greatly reduces future health care costs, as well as increasing patients' health." Mike Huckabee has said that a focus on prevention "would save countless lives, pain and suffering by the victims of . . . *[Full Text of this Article]*

Source Information

Dr. Cohen is a research associate professor of medicine and Dr. Neumann a professor of medicine and the director at the Center for the Evaluation of Value and Risk in Health, Institute for Clinical Research and Health Policy Studies, Tufts–New England

Medical Center, Boston; Dr. Weinstein is a professor of health policy and management at the Harvard School of Public Health, Boston.

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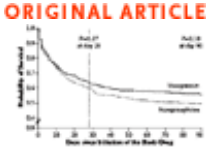


Vasopressin versus Norepinephrine Infusion in Patients with Septic Shock

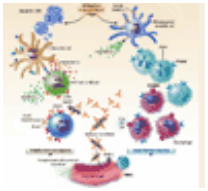
Patients with septic shock were randomly assigned to either norepinephrine or vasopressin in addition to open-label vasopressors. There was no significant difference between the two groups in mortality at either 28 or 90 days. CME Exam

ORIGINAL ARTICLE

Severe Anemia in Malawian Children

In this study of Malawian preschool children with severe anemia, deficiencies of folate and iron were infrequent and multiple infectious agents in addition to malaria parasites were contributing causes. Free Full Text

ORIGINAL ARTICLE

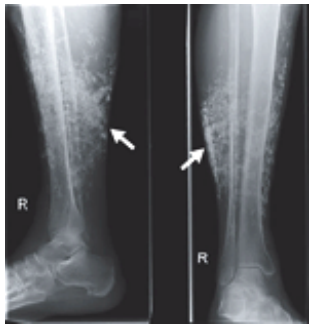


Two New Susceptibility Loci for Systemic Lupus Erythematosus

A genomewide association study showed that two new loci confer susceptibility to systemic lupus erythematosus. These loci are close to genes that encode B lymphoid tyrosine kinase and integrin alpha M.

Published Online January 20, 2008 (DOI: 10.1056/NEJMoa0707865)

IMAGE OF THE WEEK

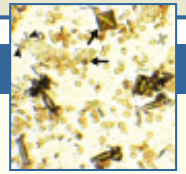


Subcutaneous Calcification

This 70-year-old woman was referred for evaluation of an ulcerative lesion on her right lower leg. She had chronic venous insufficiency.

Recent Featured Images

IMAGE CHALLENGE



Submit Your Answer

RECENT NEJM AUDIO

Interview: Gretchen Berland and Galen Buckwalter on interactions between physicians and patients

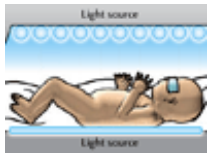
ORIGINAL ARTICLE

Cumulative Association of Five Genetic Variants with Prostate Cancer

This study identified five SNPs in chromosomal regions 8q and 17q that had a strong association with prostate cancer when combined. The strength of the association increased with the number of prostate-cancer–associated SNPs in the genome.

Published Online January 16, 2008 (DOI: 10.1056/NEJMoa075819)

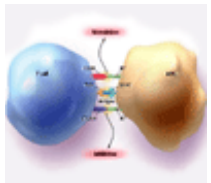
CLINICAL THERAPEUTICS



Phototherapy for Neonatal Jaundice

In term and late-preterm infants, phototherapy is typically used according to guidelines that take into account the total serum bilirubin level, gestational age, postpartum age, and specific risk factors. CME Exam

MECHANISMS OF DISEASE

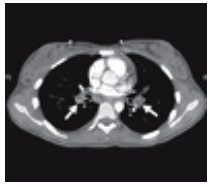


Systemic Lupus Erythematosus

This review provides data that show that antibodies against double-stranded DNA cause the renal lesions of systemic lupus erythematosus, and it emphasizes the importance of histones, histone fragments, and other nuclear autoantigens.

CME Exam

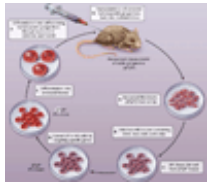
CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL



A Girl with Chest Pain and Hemoptysis

A 17-year-old girl had chest pain for 2 weeks, along with hemoptysis, fever, tachycardia, and tachypnea. CT angiography showed emboli in both pulmonary arteries, and echocardiography showed acute right heart strain. (View videos showing the results of echocardiography.)

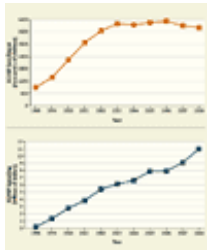
CLINICAL IMPLICATIONS OF BASIC RESEARCH



Curing Sickle Cell Anemia in a Mouse Model

Genetically corrected stem cells obtained from a mouse model of sickle cell anemia cure the mouse of disease.

PERSPECTIVE



The Proxy War — SCHIP and the Government's Role in Health Care Reform

Why would President Bush veto bipartisan legislation that does precisely what he insisted on — namely, aggressive enrollment of the poorest children? Sara Rosenbaum writes that in the end, the SCHIP battle became a proxy war over the duties that government should assume in national health care reform. Free Full Text

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PERSPECTIVE

The Vanishing Nonforensic Autopsy

Despite the benefits of autopsies, they are performed after less than 10% of all deaths in the United States. Drs. Kaveh Shojania and Elizabeth Burton discuss the trends in U.S. autopsy rates.

EDITORIALS

Septic Shock — Vasopressin, Norepinephrine, and Urgency

Collaboration, Genetic Associations, and Lupus Erythematosus

Published Online January 20, 2008 (DOI: 10.1056/NEJMe0800096)

Complexities of Prostate-Cancer Risk

Published Online January 16, 2008 (DOI: 10.1056/NEJMe0708703)

CORRESPONDENCE

Zoledronate, Fractures, and Mortality

Growth Hormone–Releasing Factor and HIV

Bilateral Breast Cancer

Medical Mystery: Cloud Surrounding the Optic Disks — The Answer

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Review of *Thomas Eakins* Free Full Text

CT and Diagnosis of Appendicitis and Perforation

Newborn Screening for Cystic Fibrosis

UPCOMING IN PRINT

Published Online February 13, 2008

▶A Nationally Representative Case–Control Study of Smoking and Death in India

Published Online February 6, 2008

▶A New Arenavirus in a Cluster of Fatal Transplant-Associated Diseases

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NEJM Online contains both the current issue and an online archive that can be accessed through browsing, advanced searching, or collections by disease or topic.
Subscriber services include PDA content access, PowerPoint downloads, and continuing medical education (CME).

The NEW ENGLAND JOURNAL of MEDICINE

PERSPECTIVE

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Does Preventive Care Save Money? Health Economics and the Presidential Candidates

Joshua T. Cohen, Ph.D., Peter J. Neumann, Sc.D., and Milton C. Weinstein, Ph.D.

Since this article has no abstract, we have provided an extract of the first 100 words of the full text and any section headings.

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Source Information

Dr. Cohen is a research associate professor of medicine and Dr. Neumann a professor of medicine and the director at the Center for the Evaluation of Value and Risk in Health, Institute for Clinical Research and Health Policy Studies, Tufts–New England

Medical Center, Boston; Dr. Weinstein is a professor of health policy and management at the Harvard School of Public Health, Boston.

The NEW ENGLAND JOURNAL of MEDICINE

PERSPECTIVE

Volume 358:661-663 February 14, 2008 Number 7

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Does Preventive Care Save Money? Health Economics and the Presidential Candidates

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Indeed, some evidence does suggest that there are opportunities to save money and improve health through prevention. Preventable causes of death, such as tobacco smoking, poor diet and physical inactivity, and misuse of alcohol have been estimated to be responsible for 900,000 deaths annually — nearly 40% of total yearly mortality in the United States.[1] Moreover, some of the measures identified by the U.S. Preventive Services Task Force, such as counseling adults to quit smoking, screening for colorectal cancer, and providing influenza vaccination, reduce mortality either at low cost or at a cost savings.[2]

Sweeping statements about the cost-saving potential of prevention, however, are overreaching. Studies have concluded that preventing illness can in some cases save money but in other cases can add to health care costs.[3] For example, screening costs will exceed the savings from avoided treatment in cases in which only a very small fraction of the population would have become ill in the absence of preventive measures. Preventive measures that do not save money may or may not represent cost-effective care (i.e., good value for the resources expended). Whether any preventive measure saves money or is a reasonable investment despite adding to costs depends entirely on the particular intervention and

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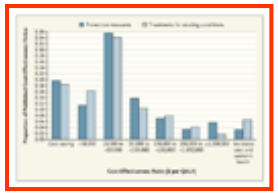
the specific population in question. For example, drugs used to treat high cholesterol yield much greater value for the money if the targeted population is at high risk for coronary heart disease, and the efficiency of cancer screening can depend heavily on both the frequency of the screening and the level of cancer risk in the screened population.[4]

The focus on prevention as a key source of cost savings in health care also sidesteps the question of whether such measures are generally more promising and efficient than the treatment of existing conditions. Researchers have found that although high-technology treatments for existing conditions can be expensive, such measures may, in certain circumstances, also represent an efficient use of resources.[5] It is important to analyze the costs and benefits of specific interventions.

A systematic review of the cost-effectiveness literature sheds light on these issues. We analyzed the contents of the Tufts–New England Medical Center Cost-Effectiveness Analysis Registry (www.tufts-nemc.org/cearegistry), which consists of detailed abstracted information on published cost-effectiveness studies through 2005. Each registry article estimates the cost-effectiveness of one or more interventions as the incremental costs (converted here to 2006 U.S. dollars) divided by the incremental health benefits quantified in terms of quality-adjusted life-years (QALYs). Low cost-effectiveness ratios are "favorable" because they indicate that incremental QALYs can be accrued inexpensively. An intervention is "cost-saving" if it reduces costs while improving health. Poorly performing interventions can both increase costs and worsen health.

Our analysis was restricted to the 599 articles (and 1500 ratios) published between 2000 and 2005 that properly discounted future costs and benefits. We classified 279 ratios as preventive because they refer to interventions designed to avert disease or injury; all 1221 other ratios pertain to treatments, a category that includes both "tertiary" measures (designed to ameliorate the effects of a disease or condition) and "secondary prevention" measures (designed to reverse or retard progression of an existing condition), such as the use of implantable cardioverter–defibrillators in patients with myocardial disease.

The bar graph shows that the distributions of cost-effectiveness ratios for preventive measures and treatments are very similar — in other words, opportunities for efficient investment in health care programs are roughly equal for prevention and treatment, at least as reflected in the literature we reviewed. Moreover, both distributions span the full range of cost-effectiveness. The table shows the cost-effectiveness ratios for selected interventions of various types (a more detailed table appears in the Supplementary Appendix, available with the full text of this article at www.nejm.org).



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Distribution of Cost-Effectiveness Ratios for Preventive Measures and Treatments for Existing Conditions.

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Cost-Effectiveness of Selected Preventive Measures and Treatments for Existing Conditions (2006 Dollars).

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Of course, our review reflects a selected sample of studies in the peer-reviewed literature and does not cover all possible opportunities to spend resources to improve health. In addition, there may be inconsistency among the studies in terms of the methods used. Still, our analysis is based on a large and diverse set of studies that used recommended metrics for cost-effectiveness analysis, and we believe that it offers important lessons.

Our findings suggest that the broad generalizations made by many presidential candidates can be misleading. These statements convey the message that substantial resources can be saved through prevention. Although some preventive measures do save money, the vast majority reviewed in the health economics literature do not. Careful analysis of the costs and benefits of specific interventions, rather than broad generalizations, is critical. Such analysis could identify not only cost-saving preventive measures but also preventive measures that deliver substantial health benefits relative to their net costs; this analysis could also identify treatments that are cost-saving or highly efficient (i.e., cost-effective).

In addition to determining which preventive measures and treatments are most efficient, it will be necessary to identify those that are not yet fully deployed and those that could serve a large population and bring about substantial aggregate improvements in health at an acceptable cost. Findings that some cost-saving or highly efficient measures are underused would indicate that current practice is inconsistent with the efficient delivery of health care. Other services might be identified as overused, and such findings would underscore the importance of fashioning policies that provide incentives to shift practice toward more cost-effective delivery of health care. In the face of increasingly constrained resources, there is a realistic way of achieving better health results: conduct careful analysis to identify evidence-based opportunities for more efficient delivery of health care — whether prevention or treatment — and then restructure the system to create incentives that encourage the appropriate delivery of efficient interventions.

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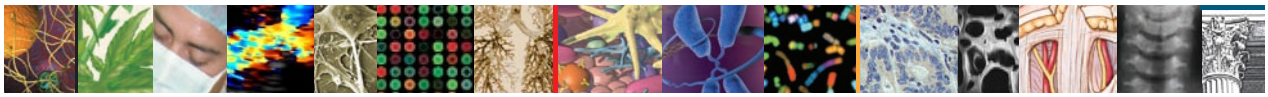

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Perspective

FEBRUARY 14, 2008

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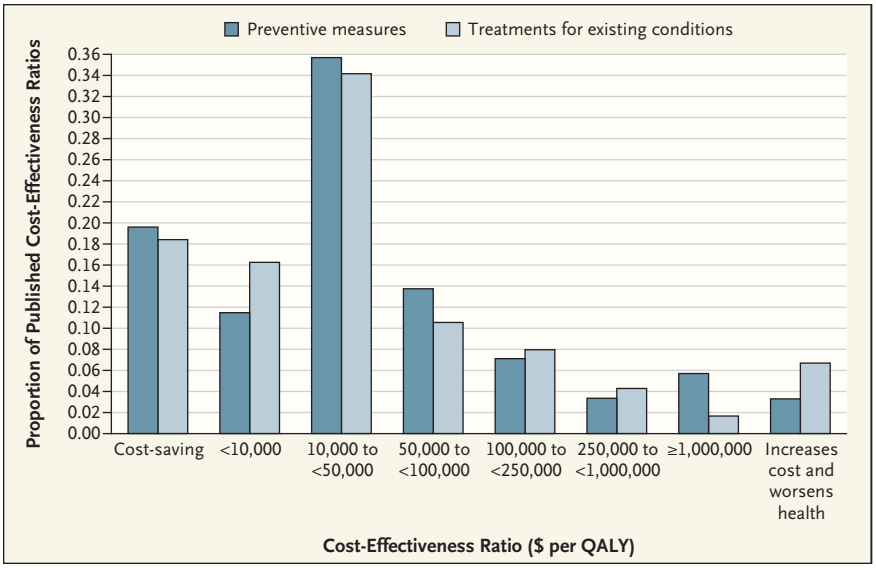

Distribution of Cost-Effectiveness Ratios for Preventive Measures and Treatments for Existing Conditions.

Data are from the Tufts–New England Medical Center Cost-Effectiveness Registry. QALY denotes quality-adjusted life-year.

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Cost-Effectiveness of Selected Preventive Measures and Treatments for Existing Conditions (2006 Dollars).*

Intervention	Cost-Effectiveness Ratio
Preventive measures	
Haemophilus influenzae type b vaccination of toddlers	Cost-saving
One-time colonoscopy screening for colorectal cancer in men 60–64 years old	Cost-saving
Newborn screening for medium-chain acyl-coenzyme A dehydrogenase deficiency	$160/QALY
High-intensity smoking-relapse prevention program, as compared with a low-intensity program	$190/QALY
Intensive tobacco-use prevention program for seventh- and eighth-graders	$23,000/QALY
Screening all 65-year-olds for diabetes as compared with screening 65-year-olds with hypertension for diabetes	$590,000/QALY
Antibiotic prophylaxis (amoxicillin) for children with moderate cardiac lesions who are undergoing urinary catheterization	Increases cost and worsens health
Treatments for existing conditions	
Cognitive-behavioral family intervention for patients with Alzheimer's disease	Cost-saving
Cochlear implants in profoundly deaf children	Cost-saving
Combination antiretroviral therapy for HIV-infected patients	$29,000/QALY
Liver transplantation in patients with primary sclerosing cholangitis	$41,000/QALY
Implantation of cardioverter–defibrillators in appropriate populations, as compared with medical management alone	$52,000/QALY
Left ventricular assist device, as compared with optimal medical management, in patients with heart failure who are not candidates for transplantation	$900,000/QALY
Surgery in 70-year-old men with a new diagnosis of prostate cancer, as compared with watchful waiting	Increases cost and worsens health

* The cost-effectiveness ratio is the incremental costs divided by the incremental benefits, relative to a comparator. The comparator is omitted from the intervention's description if it was no treatment or current treatment or if the intervention was added to, rather than substituted for, another treatment. The cost-effectiveness estimates listed are point-estimate values from the original articles (a more detailed table appears in the Supplementary Appendix, available with the full text of this article at www.nejm.org). Preventive measures are those designed to avert the development of a condition. Treatments for existing conditions include both those designed to prevent the progression of a condition and those designed to ameliorate the effects of a disease or condition. QALY denotes quality-adjusted life-year. For more information see www.tufts-nemc.org/cearegistry.

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This appendix has been provided by the authors to give readers additional information about their work.

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U.S. Preventive Services Task Force (USPSTF)

An independent panel of experts in primary care and prevention that systematically reviews the evidence of effectiveness and develops recommendations for clinical preventive services.

- Recommendations
- Pocket Guide to Clinical Preventive Services, 2007

New Releases in Preventive Services

- Screening for Bacterial Vaginosis in Pregnancy (February 2008)
- Screening for Illicit Drug Use (January 2008)
- Update on Methods: Estimating Certainty and Magnitude of Net Benefit (December 2007)

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Find recommendations by patient's age, sex, and pregnancy status

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Preventive Care: A National Profile on Use, Disparities, and Health Benefits

August 2007

Study Sponsors:

Centers for Disease Control and Prevention

The Robert Wood Johnson Foundation

WellPoint Foundation

Overview

This report demonstrates that there is significant underuse of effective preventive care in the United States, resulting in lost lives, unnecessary poor health, and inefficient use of health care dollars. All of the services examined in this report are extremely cost effective: they all provide an excellent return on investment. It is a national imperative to make these and other cost-effective preventive services affordable and accessible for all Americans.

Following up on the National Commission on Prevention Priorities' rankings that demonstrate the most valuable preventive services for the U.S. population, this report

- **Documents the use of preventive care** across the United States;
- **Estimates the health benefits** for the U.S. population of increasing the use of preventive services from current utilization rates to 90 percent;
- **Quantifies disparities** in use of preventive care by comparing the use of services by racial and ethnic groups to the white, non-Hispanic population; and

- **Gives special attention to cancer screenings** by estimating the lives that would be saved if breast, cervical, and colorectal cancer screening rates increased from current screening rates to 90 percent among racial and ethnic groups.

Read the Report Highlights.

Download the entire report or report chapters:
Entire Report
Letter from the Chair of the National Commission on Prevention Priorities, Dr. Eduardo Sanchez
Acknowledgments
Report Highlights
Introduction
Prevention: A Key Indicator of Quality
Use of High-Value Preventive Services and Lives Saved If Use of Services Improved
Disparities in Use of High-Value Preventive Services
Cancer Screening: Lives Saved If Screenings Were Increased among Racial and Ethnic Groups
Appendix: Data Sources and Gaps on Use of 25 Clinical Preventive Services for General State or National Populations

Data Needed to Assess Use of High-Value Preventive Care: A Brief Report from the National Commission on Prevention Priorities
Describes the data needed to measure whether the U.S. population is using cost-effective preventive services.

Read the press release.
View the citations.

Report Highlights

LOW USE OF PREVENTIVE CARE COSTS LIVES
Utilization rates remain low for preventive services that are very cost effective and have been recommended for years. Increasing the use of just 5 preventive services would save more than 100,000 lives each year in the United States.

- 45,000 additional lives would be saved each year if we increased to 90 percent the portion of

adults who take aspirin daily to prevent heart disease. Today, fewer than half of American adults take aspirin preventively.

- 42,000 additional lives would be saved each year if we increased to 90 percent the portion of smokers who are advised by a health professional to quit and are offered medication or other assistance. Today, only 28 percent of smokers receive such services.
- 14,000 additional lives would be saved each year if we increased to 90 percent the portion of adults age 50 and older who are up to date with any recommended screening for colorectal cancer. Today, fewer than 50 percent of adults are up to date with screening.
- 12,000 additional lives would be saved each year if we increased to 90 percent the portion of adults age 50 and older immunized against flu annually. Today, 37 percent of adults have had an annual flu vaccination.
- 3,700 additional lives would be saved each year if we increased to 90 percent the portion of women age 40 and older who have been screened for breast cancer in the past 2 years. Today, 67 percent of women have been screened in the past 2 years.

    - Breast and cervical cancer screening rates were lower in 2005 compared to five years earlier for every major racial and ethnic group: White, Hispanic, African American and Asian women all experienced declines.

- 30,000 cases of pelvic inflammatory disease would be prevented annually if we increased to 90 percent the portion of sexually active young women who have been screened in the past year for chlamydial infection. Today, 40 percent of young women are being screened annually.

RACIAL AND ETHNIC DISPARITIES IN USE OF PREVENTIVE CARE

In several important areas, use of preventive care among racial and ethnic groups lags behind that of non-Hispanic whites.

Hispanic Americans have lower utilization compared to non-Hispanic whites and African Americans for 10 preventive services.

- Hispanic smokers are 55 percent less likely to get assistance to quit smoking from a health professional than white smokers.
- Hispanic adults age 50 and older are 39 percent less likely to be up to date on colorectal cancer screening than white adults.
- Hispanic adults age 65 and older are 55 percent less likely to have been vaccinated against pneumococcal disease than white adults.

Asian Americans have the lowest utilization of any group for aspirin use as well as breast, cervical

and colorectal cancer screening.

- Asian men age 40 and older and women age 50 and older are 40 percent less likely to use aspirin to prevent heart disease than white adults.
- Asian adults age 50 and older are 40 percent less likely to be up to date on colorectal screening than white adults.
- Asian women ages 18 to 64 are 25 percent less likely to have been screened for cervical cancer in the past 3 years than white women.
- Asian women age 40 and older are 21 percent less likely to have been screened for breast cancer in the past two years than white women.

Despite higher screening rates among African Americans for colorectal and breast cancer compared to Hispanic and Asian Americans, increasing screening in African Americans would have a bigger impact on their health because they have higher mortality for those conditions.

- If the 42 percent of African Americans age 50 and older up-to-date with any recommended screening for colorectal cancer increased to 90 percent, 1,100 additional lives would be saved annually. This is a rate of 16 per 100,000 African Americans age 50 and older, substantially more than the corresponding rates of 13, 8 and 7 per 100,000 additional lives saved for whites, Hispanics, and Asians, respectively.

CONCLUSION

Low utilization rates for cost-effective preventive services reflect the emphasis that our health care system currently gives to providing acute care. Among the 12 preventive services examined in this report, 7 are being used by about half or less of the people who should be using them. Racial and ethnic minorities are getting even less preventive care than the general U.S. population.

Expanding the delivery of preventive services of proven value would enable millions of Americans to live longer, healthier, and more fulfilling lives. There is the potential to save 100,000 lives annually by increasing use of just 5 preventive services. It would also lead to more effective use of the nation's resources because the United States would get more value--in terms of premature death and illness avoided--for the dollars it spends on health care services.

Citations:

National Commission on Prevention Priorities. *Preventive Care: A National Profile on Use, Disparities, and Health Benefits*. Partnership for Prevention, August 2007.

National Commission on Prevention Priorities. *Data Needed to Assess Use of High-Value Preventive Care: A Brief Report from the National Commission on Prevention Priorities.* Partnership for Prevention, August 2007.

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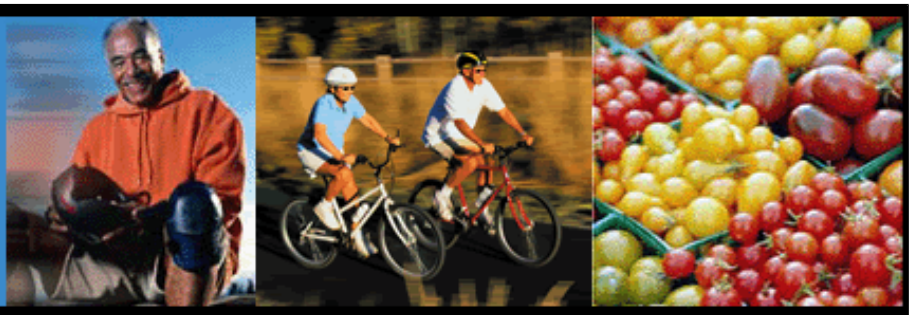

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News

Here you can find regional and national news stories about the Healthy Memphis Common Table, as well as past newsletters and events.

Cardinal Health Introduces New Reporting Method for Pay-For-Performance

A more accurate method to report quality of care by hospitals and/or healthcare providers has been developed by Cardinal Health.

The new methodology is based on clinical data rather than administrative data, according to Cardinal Health.

Cardinal Health said its study across six major diseases showed that using clinical data more accurately accounts for the severity of an illness and leads to more clinically valid quality measurements than traditional methods.

Pay-for-performance (P4P) and public accountability reporting have seen increased interest across healthcare providers, government agencies and insurance companies as incentive-based initiatives to help control rising healthcare costs and improve quality, the company said.

Risk-adjusted mortality rates are widely accepted quality measures for the healthcare industry. Thesequality measures are made by comparing expected mortality rates for specific disease groups to the actual mortality rates that occur.

Traditionally, the models used to predict mortality are based on the analysis of billing or administrative data from the healthcare provider, according to Cardinal Health.

Physicians, healthcare administrators and researchers all point to fundamental flaws in using administrative data because it does not appropriately account for severity of illness, which can disadvantage those hospitals that take in the most critically ill patients, Cardinal Health said.

To address the challenge of developing a clinically valid and cost-effective reporting system, researchers from Cardinal Health, the Center for Outcomes Research at the Children's Hospital of Philadelphia and the University of Pennsylvania School of Medicine analyzed data from more than one million admissions to create models that are clinically sound and adequately adjusted for

Recent News Articles

Cardinal Health Introduces New Reporting Method for Pay-For-Performance

Preventive health-care practices could avert 100,000 deaths each year

Delta Regional Authority Kicks Off Healthy Delta!

Delta Health Alliance continues to address rural health problems in the Mississippi Delta

Bredesen Outlines Diabetes-Prevention Strategy

News Archives

severity of illness. The new approach maximizes the use of automated laboratory data, but is more cost-effective than relying on chart abstraction.

The researchers found that laboratory data contributed more to the prediction of mortality compared to any other data source across most diseases except for stroke, where altered mental status is more important than lab results, Cardinal Health said.

Laboratory data proved to be up to 67 times more important in predicting mortality than administrative data alone, the company said.

"These findings are significant in light of increased interest in pay-for-performance and public reporting initiatives and highlight the urgent need for valid, clinically-based risk-adjusted approaches," said Dwight Winstead, group president of clinical technologies and services for Cardinal Health.

Cardinal Health published the final findings in the August issue of Medical Care, the official journal of the medical care section of the American Public Health Association.

All six models were found to be clinically plausible and can be cost-effective to implement for P4P and public accountability reporting.

Address: Cardinal Health, 7000 Cardinal Place, Dublin, OH 43017; (614) 757-5000, **http://www.cardinalhealth.com**.

Preventive health-care practices could avert 100,000 deaths each year

ABC World News (8/8, story 7, 1:50, Gibson) reported, "A new medical report out today, finds that tens of thousands of American lives could be saved every year, if more people would simply take some easy and inexpensive steps." ABC (McKenzie) added, "The report found that with a daily aspirin -- if used by more adults, with a high risk of heart disease, especially men over 40 and women over 65 -- about 45,000 lives could be saved each year. Also, the study finds that more doctors offering to help patients quit smoking could have a similar effect." Dr. Kathleen Toomey, the director of the Coordinating Center for Health Promotion at the CDC, was shown saying, "What this study shows is that even a modest investment in preventive services can have a dramatic impact. And, doctors can have a surprising influence on patients to make decisions, such as to quit smoking." McKenzie added, "Currently, only 28 percent of doctors offer assistance. Get that rate up to 90 percent and the report calculates enough Americans would quit smoking to save another 42,000 lives."

WebMD (8/9, Warner) reports that "if more Americans followed just five simple preventive health-care practices, nearly 100,000 deaths each year could be prevented." According to the study, underutilized, but highly beneficial, health-care services, include "daily aspirin therapy" to prevent heart disease, "smoking cessation," and "annual flu vaccinations." Moreover, another "14,000 additional lives would be saved each year by increasing to 90 percent the portion of adults aged 50 and older who are up-to-date with any recommended screening for

colorectal cancer"; and, an additional "3,700 lives would be saved each year by increasing to 90 percent the portion of women ages 40 and older who have been screened for breast cancer in the past two years." In addition, the research conducted by the National Commission on Prevention Priorities noted disparities in preventive health care. Eduardo Sanchez, M.D., who chairs the commission, emphasized that "a lot of Americans are not getting lifesaving preventive services, particularly racial and ethnic minorities. As a result, too many people are dying prematurely or living with diseases that could have been prevented." For example, the study found that Latino "smokers are 55-percent less likely to get assistance in quitting smoking than whites."

Delta Regional Authority Kicks Off Healthy Delta!

Pete Johnson, the federal co-chairman of the Delta Regional Authority, unveiled the DRA's Healthy Delta initiative and spoke with reporters about the effort to decrease the effect of diabetes in the region at the National Press Club in Washington on Wednesday, September 27, 2006

The Delta Regional Authority board is devoting almost $1 million to begin a diabetes education and prevention program, known as the **Healthy Delta** program. This effort will attempt to bring about real change, starting with diabetes. The diabetes program is designed to drive Delta residents to a call center and website. The major goals are:

- Educating Delta residents on the symptoms and dangers of diabetes.
- Getting people in the Delta region to do something about their diabetes by calling a toll-free number for more information and a referral.

The DRA hopes to later pursue broader health and wellness issues in the region. A special effort is being made to ensure the message does not miss hard-to-reach minority populations in the eight states served. **www.healthydelta.com/welcome.html**

Delta Health Alliance continues to address rural health problems in the Mississippi Delta

The Delta Health Alliance was founded in 2001 to address health issues in the Mississippi Delta, and is a partnership between Delta State University, Mississippi State University, Mississippi Valley State University, University of Mississippi Medical Center, and Delta Council. Delta Health Alliance also has four associate partners: The Mississippi Association of Community Health Centers, Mississippi Medical Association, Mississippi Hospital Association, and Area Health and Education Centers.

These organizations collaborate to create a comprehensive program that addresses the longstanding, unmet rural health needs of the Mississippi Delta, and focus on increasing access and availability of care, conducting and applying health research, and offering health education programs. To learn more, visit Delta Health Alliance at **www.deltahealthalliance.com**

Bredesen Outlines Diabetes-Prevention Strategy

Meets with National Health Leaders to Seek Input, Advice

Memphis — On September 18, 2006, Governor Phil Bredesen introduced an aggressive new plan to encourage Tennessee pre-teens and teenagers to adopt healthier lifestyles and attack the rising diabetes epidemic linked to poor eating and exercise habits.

Speaking to national health leaders at a Memphis forum organized by the Council of State Governments and the Robert Wood Johnson Foundation, Bredesen outlined a series of new investments in public schools across Tennessee designed to counteract what he called a "perfect storm" — the ever-increasing prevalence of fast food combined with TV and video games and diminishing attention to physical activity.

Bredesen said a rising incidence of childhood obesity, which leads to Type-2 diabetes (also known as "adult onset" diabetes), is threatening the health of kids in urban, suburban and rural areas across Tennessee.

"Like many American kids, Tennessee's children are at risk," the Governor said. "If a child today is diagnosed as a pre-teen with Type-2 diabetes, they'll have vision problems in their twenties, heart disease in their thirties and kidney dialysis in their forties. The good news is we absolutely know how to prevent this. We just need to put our heads down and do it."

He added: "Our kids deserve nothing less."

Tennessee's diabetes prevention strategy has two main components: an innovative new initiative known as "Project Diabetes" and significant new investments in Tennessee's existing Coordinated School Health program:

Project Diabetes

1. $6 million in grants approved by the General Assembly to help communities across Tennessee combat diabetes in ways that work best locally, including launching new community and public awareness initiatives or expanding existing nonprofit efforts that already are working well.
2. $1 million for the National Institutes of Health to launch a pilot project with 10 Tennessee high schools designed to persuade teens to change behaviors when it comes to food and exercise. Among other things, the multi-faceted approach will use youth-oriented technology, such as email and cell phone text messaging, to communicate with young people in and out of school.

Coordinated School Health

1. $15 million approved by the General Assembly to expand Tennessee's longstanding but historically limited Coordinated School Health initiative. The comprehensive program — which includes everything from expanded classroom education to more P.E. to nutrition programs to counseling — now is in only 10 school systems statewide but will be expanded to virtually every school system in the state.
2. According to Bredesen: "Some school systems may want to take the

additional resources to do new work with body-mass indexes and how to effectively use them. Others may find ways to turn their cafeterias into real-world classrooms — maybe demonstrate that macaroni and cheese, however comforting, is not the state vegetable."

In addition to outlining Tennessee's new diabetes-prevention strategy, Bredesen reached out to officials from other states and nonprofit groups attending the Memphis forum to suggest national or regional partnerships in an effort to leverage best practices, latest research and available resources. "The more we can lock arms with like-minded states and organizations, the better off our kids will be in the future," the Governor said.

Bredesen said the State of Tennessee and Project Diabetes has had preliminary discussions with the nonprofit Alliance for a Healthier Generation to collaborate moving forward. The nonprofit New York-based initiative's current partners include the American Heart Association, former President Bill Clinton and Arkansas Governor Mike Huckabee.

Bredesen said the ultimate goal of Tennessee's new diabetes prevention strategy is to short-circuit a looming public health crisis before it occurs rather than just standing by and paying for treatment after it happens.

"Prevention is one of the great frontiers in health care," Bredesen added. "It's time for us to move beyond just funding the treatment of disease. It's time for us to find ways to prevent it. I want Tennessee to be a pioneer and a national leader, starting with diabetes prevention."

www.tennesseeanytime.org/governor/AdminCMSServlet

News Archives

January 21, 2006: **Shaping America's Youth Town Meeting:** **Click here for the preliminary report.** The "Shaping America's Youth Town Meeting", a 21st Century Town Meeting enabled over 1,000 participants to provide input to both local and national decision-makers on a National Action Plan for addressing the childhood obesity issue. View event photos! **www.shapingamericasyouth.org/Page.aspx**

October, 2005: **Gotta Have Park Festival**

January 14, 2005:**Leadership Memphis: Building a Healthier Memphis Class Day**

January 5, 2005: **Third Annual Rice Intercollegiate Bowl**

November 22, 2004: **Holiday Letter to Community Partners & Friends**

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Preventive Health Examinations and Preventive Gynecological Examinations in the United States

Mehrotra A, Zaslavsky AM, Ayanian JZ. *Archives of Internal Medicine*, Vol. 167, no. 17, Sept. 2007, pp. 1876-1883.

Read article (may require registration or payment on *Archives of Internal Medicine* website)

Background

Preventive health examinations (PHEs) are controversial, and limited data are available on their use and content.

Methods

We conducted a retrospective analysis of 8413 ambulatory visits from January 1, 2002, to December 31, 2004, for PHEs and preventive gynecological examinations (PGEs) by adults in the National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey. Population estimates were obtained from the Current Population Survey. We estimated rates of PHEs and PGEs by patients' demographic characteristics, the frequency of 8 preventive services provided at these visits, and total costs of PHEs and PGEs at Medicare reimbursement rates.

Results

An estimated 44.4 million adults per year (20.9%; 95% confidence interval [CI], 18.2%-23.6%) received a PHE, and 19.4 million women per year (17.7% of adult women; 95% CI, 14.9%-20.4%) received a PGE, together accounting for 8.0% of all ambulatory visits. The PHE rates varied by region (Northeast vs West: relative risk, 1.58; 95% CI, 1.17-

2.14) and insurance type (those without vs those with private insurance or Medicare: relative risk, 0.51; 95% CI, 0.40-0.65). Preventive services occurred at 52.9% (95% CI, 48.8%-57.0%) of PHEs and 83.5% (95% CI, 80.7%-86.3%) of PGEs, but only 19.9% (95% CI, 18.4%-21.5%) of 8 preventive services occurred at a PHE or PGE. The annual costs of these visits were approximately $7.8 billion.

Conclusions

PHEs and PGEs are among the most common reasons adults see a physician. These visits frequently include preventive services, but most preventive services are provided at other visits. These findings provide a foundation for continuing national deliberations about the use and content of PHEs and PGEs.

Genetics and preventive health care

Genetics and preventive health care

In the October 2007 issue of *Australian Family Physician* there is a clinical review titled *Genetics and preventive health care* by Jon Emery from the University of Western Australia, Kristine Barlow-Stewart from the University of Sydney, Sylvia A Metcalfe from the University of Melbourne, and David Sullivan from the Royal Prince Alfred Hospital, Sydney that begins: **"With the mapping and sequencing of the human genome, knowledge about the genetics of common chronic diseases is growing rapidly. While the genetics revolution still has some time before if has widespread impact on clinical practice, there are several examples of how the application of new genetic knowledge may play a significant role in preventive health care. Perhaps the earliest examples have come from the discovery of genes that predispose to certain cancers. In this article we discuss two specific conditions that demonstrate the role of genetic medicine in chronic disease prevention - familial hypercholesterolemia and hereditary hemochromatosis.**

"Advances in our understanding of the genetics of common chronic disease is beginning to impact on clinical practice and preventive health care. This article discusses the potential for genetic medicine to inform disease prevention strategies. It describes two examples already affecting clinical general practice: familial hypercholesterolaemia and hereditary haemochromatosis. These represent important inherited conditions that, if diagnosed early, can be simply treated and their complications avoided. General practitioners can play an important role in the early diagnosis of these conditions and subsequent screening of at risk relatives. These conditions highlight the potential for genetic medicine to be applied to support tailored disease prevention in general practice. "

For the full review, click here.

Australian Family Physician 2007;36:808-811, October 2007..

Genetics and preventive health care, Jon Emery, Kristine Barlow-Stewart, Sylvia A Metcalfe, David Sullivan.
Correspondence to Dr. Emery: jon.emery@uwa.edu.au

Category A: General/Unspecified. Keywords: genetics, chronic disease, familial hypercholesterolemia, hemochromatosis, preventive health care, screening, clinical review
Synopsis edited by Dr Linda French, Toledo, Ohio. Posted on Global Family Doctor 11 December 2007

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Healthy People 2010 challenges individuals, communities, and professionals indeed, all of us to take specific steps to ensure that good health, as well as long life, are enjoyed by all.

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Dietary Guidelines for Americans 2005

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Healthy People is managed by the Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services

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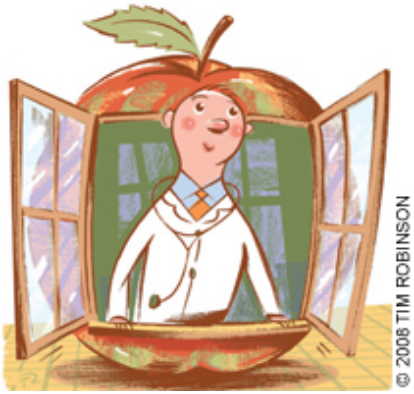
Preventive Medicine: Giving Patients the Hard Sell

Your patients will be better off if you take a more active approach and consistently advocate for prevention.

Linwood W. Watson, MD

SPEEDBAR® SUMMARY

- To improve compliance with preventive service recommendations, approach every patient visit with at least one preventive goal in mind.
- Crafting your prevention message in advance of the visit will help you promote needed services more effectively.
- Take into account a patient's social, family and cultural circumstances.
- If you truly believe prevention is important and convey that with passion, your patient will believe it too.
- You can enhance your prevention messages by sharing statistics and personal stories.



Have you ever found yourself busily attending to a patient's acute problem when all of a sudden a nagging voice inside your head reminds you that you haven't yet asked the patient about that needed flu shot, Pap smear, tetanus shot or other preventive service? Although health plans and government agencies are often quick to remind us of our preventive failures, many physicians shy away from prevention, viewing it as a can of worms they simply don't have time to open. The uncertainties of preventive care coding and reimbursement can also complicate matters. (See "Getting paid for prevention," below.)

One tactic that can help in these situations is to enter the exam room or hospital room with at least one preventive goal in mind and be prepared to "sell" it, using a few well-applied strategies:

1. Prepare a one-liner. Have a short speech prepared in your mind so you can advocate for the needed intervention. Consider this clinical scenario: You are in your clinic in early October, and thanks to your good planning, you actually have a decent supply of influenza vaccine. Your nurse is collecting a patient's vital signs and briefly asks about the flu vaccine. The patient, who has diabetes and chronic heart failure, hasn't had a

flu shot but declines the service, and the nurse notes that under the chief complaint. As you enter the exam room, you say hello to the patient and exchange pleasantries, and then - before you launch into the chief complaint - you say:

"My nurse noted you do not want the flu vaccine this year. I strongly recommend this shot, especially for a person like you. Your sugar levels and weak heart can lessen your ability to fight infection, and getting the flu could lead to a long hospital stay. If you'd like, we can give you the shot at the end of your visit today."

You can tailor your pitch to the situation, addressing typical reasons patients refuse the service (fear of needles, uneasiness about side effects, cost concerns, etc.). The key is simply that you have a spiel and are ready to use it. Start by focusing on just one preventive area that seems to fall through the cracks in your practice. Some examples include meningococcal vaccination, aspirin therapy to prevent myocardial infarction, exercise promotion, compliance with statin therapy and tetanus vaccination.

2. Know your customer. Use your knowledge of the patient and his or her social, family and cultural circumstances to craft the most effective prevention message. Family physicians have a distinct advantage here since we often see the entire family. For example, if a 12-year-old patient needs the new tetanus/pertussis combo booster, you might describe the importance of protecting adolescents from waning immunity. But if the patient also has a newborn sibling at home, you can make your spiel more effective by pointing out that pertussis in a newborn would be a medical nightmare and the 12-year-old fits within the prime demographic for pertussis carriers.

3. Know your product. Knowledgeable salespeople keep useful product facts and figures fresh in their mind. You can use this technique to promote preventive strategies as well. With vaccines, don't focus on administration details or recommended age ranges. Instead, focus on physiologic benefits. Note that the flu vaccine covers not one but three influenza strains. Point out that the pneumonia vaccine often stops some of the most resistant strains of streptococcus pneumonia. Focus on the well-proven benefit of statins for heart attack and stroke prevention.

Getting paid for prevention

Getting paid for preventive services depends on correct coding. Here's how to code four common types of preventive visits.

A standard preventive E/M visit. Use a CPT preventive medicine service code (99381-99397) plus the appropriate ICD-9 code.

A preventive E/M visit with a problem-oriented service. Use a CPT preventive medicine service code (99381-99397) plus the appropriate E/M code (99201-99215) with modifier 25 attached to show that the services were significant and separate. Link the appropriate ICD-9 code(s) to each CPT code to help distinguish the services. Note that not all payers will reimburse for both preventive and problem-oriented services on the same date.

A preventive visit for a Medicare patient. Medicare does not reimburse for CPT's preventive medicine services codes, but it does cover certain screening services. (See "What's New in Medicare Preventive Benefits," *FPM*, February 2007.) Submit the appropriate HCPCS and ICD-9 codes to Medicare for the covered screening services and assign the appropriate CPT preventive medicine services code to any other preventive service provided, charging the patient for that portion of the visit.

A preventive counseling visit. Counseling that occurs during a preventive medicine encounter is considered to be part of the preventive medicine services codes. When preventive counseling is the

focus of a separate visit, it should be reported with the preventive counseling codes (99401-99412).

For more information see "Making Sense of Preventive Medicine Coding," *FPM*, April 2004.

4. Be passionate. Passion speaks volumes and can greatly aid your delivery of a preventive one-liner. If you really believe in the preventive service you're touting, the patient is more likely to believe in it too. Even if you don't have a passion for prevention, you can usually get enthusiastic about something you hate. For example, if you dread sending your patients to dialysis, advocate for microalbuminuria screenings in your patients who have diabetes. Or if you can't bear the idea of having to explain a colposcopy to a 14-year-old patient and her mother, then direct your energy toward increasing HPV vaccination in adolescent women.

5. Hone your delivery. If a one-liner feels awkward, fine tune your approach to your natural comfort level. If you like statistics, incorporate some disease reduction rates. If you prefer a more emotional approach, share an anecdote to make your point.

For example, one Sunday afternoon, I spent 30 minutes in an urgent care setting removing more than 60 sutures from the facial wounds and abrasions of an 11-year-old girl who was injured while driving a four-wheeler without a helmet. She had initially been treated by an ENT and plastic surgery team two hours away but needed some follow-up between surgery appointments. The story of her scarred face is a quick but poignant tale for my "parental supervision/safety one-liner" during well-child physicals. While this measure won't prevent all injuries, it helps me feel as though I am truly practicing the art of medicine.

Try these strategies for yourself, and you may wind up selling your patients on preventive measures that could significantly improve their health and well-being.

Send comments to fpmedit@aafp.org.

About the Author

Dr. Watson is a family physician in Raleigh, N.C. Author disclosure: nothing to disclose.

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PREVENTION

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4. Primary Prevention of Hypertension: Clinical and Public Health Advisory from the National High Blood Pressure Education Program
5. Screening for Hypertension
6. Facts About the DASH Eating Plan
7. DASH (Dietary Approaches to Stop Hypertension) diet is effective treatment for stage 1 isolated systolic hypertension
8. Effect of Dietary Sodium Intake on Blood Lipids: results from the DASH-sodium trial
9. Effects of Comprehensive Lifestyle Modification on Blood Pressure Control. Main Results of the PREMIER Clinical Trial
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19. The African American Study of Kidney Disease and Hypertension (AASK)
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Preventive Medicine & Health Promotion: Fourth Year Elective

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By Ann Rivera, MD

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PREVENTION

History and Introduction

PREVENTION CHAPTER READINGS

Health status can be measured by birth and death rates, life expectancy, quality of life, morbidity from specific diseases, risk factors, use of ambulatory care and inpatient care, accessibility of health personnel and facilities, financing of health care, health insurance coverage, and many other factors". [2]

The United States has seen a steady increase in life expectancy from 47.3 years in 1900 to 76.9 years in 2000 [2], in conjunction with a dramatic shift in the leading causes of death from infectious diseases to chronic diseases [2,3]. The downward trend in infectious disease mortality has been largely attributed to tireless prevention efforts through sanitation, immunizations, antibiotic treatments, screening technology, and public education; while on the other hand, the rise in chronic diseases accompanies growing trends in increased consumption, coupled with sedentary lifestyles and other unhealthy behaviors.

Strategies to reduce morbidity and mortality must include providing clinical preventive care as a part of routine care. While many individuals see clinicians for preventive checkups, the vast majority will not seek care unless ill or injured, and so every patient visit should provide an opportunity for preventive care [4].

Currently, the largest proportion of the health burden contributing to the Health Status of the Unites States is a direct result of unhealthy behaviors and lifestyles, and thus preventable.

Guide to Clinical Preventive Services; Second Edition (1996)

-Historical Perspective (Overview: Chapter i, pp 27 – 28 of 93)*

-Principal Findings of the U.S. Preventive Services Task Force (Overview: Chapter i, pp 29 – 32 of 93)*

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PREVENTION

Leading Causes of Death and Disability In the United States

"The leading causes of death are frequently used to describe the health status of a Nation" [2].

Heart disease, cancer and stroke are the three leading causes of death for the age group over 25 years. Unintentional injuries, most of which are motor vehicle accidents, tops the list with startling numbers for those aged 1 – 44, and is the fifth leading cause of death in the U.S.[2]

Healthy People 2010 lists individual and community determinants of health as:

- Biology
- Environment
- Policies and Interventions
- Access to Quality Health Care

Behavior and environment account for 70% of preventable deaths in the United States, while the unavailability or inaccessibility of quality healthcare remains a major contributing factor.

Read the following sources. Identify the following as well as any trends that exist.

Healthy People 2010: ***Health Status***

1. *Leading causes of morbidity and mortality*
2. *Morbidity and mortality trends based on age, gender and ethnicity*

Healthy People 2010*: Determinants of Health and Leading Health Indicators*

3. *Risk factors for morbidity and mortality*

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PREVENTION

Levels of Prevention

Primary Prevention[4,5]:

Efforts to limit the occurrence of disease in the general population, unrelated to their risk, through immunizations screening, and behavioral advice. What every person should receive. Primary prevention targets risk factors such as smoking, physical inactivity, poor nutrition, alcohol and other drug abuse, and inadequate attention to safety precautions.

Secondary Prevention[4,5]:

Preventing the progression to clinical disease through identification of asymptomatic individuals in the early stage of disease, if such early identification provides significantly better response to treatment than in those who progress to the clinical phase of disease. Secondary prevention is the primary rationale for routine screening for early disease.

Tertiary prevention[4,5]:

To reduce further or co-morbid complications and end stage illness in patients presenting with clinical disease as in the case of preventing end stage renal disease in patients being treated for hypertension.

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PREVENTION

Value of Prevention

In comparison to treatment of advanced disease, primary and/or secondary prevention will most likely result in:

- Less financial burden to the patient
- Fewer adverse events from invasive screenings and interventions
- Improved quality of life
- Fewer hospital visits, hospital admissions and emergency room visits.

The main benefit of prevention however, is reduction in morbidity and mortality.

The value of prevention can only be enhanced by effective screening, appropriate interventions, patient compliance, and sufficient access to care.

> Age- adjusted mortality from stroke has decreased by more than 50% since 1972, a trend attributed in part to earlier detection and treatment of hypertension. Dramatic reductions in the incidence of invasive cervical cancer and in cervical mortality have occurred following the implementation of screening programs using Papanicolaou testing to detect cervical dysplasia.

Guide to Clinical Preventive Services: Second Edition (1996)

- Value of Prevention (Overview: Chapter i, pp 25,6* of 93)
- Cost Effectiveness and Clinical Preventive Services (section v, pp 85- 90 of 93*)

Canadian Guide to Clinical Preventive Health Care

Preventive Guidelines: Their Role in Clinical Prevention and Health Promotion (pp 1 – 6 of 6*)

The U.S. Preventive Services Task Force (USPSTF) and the Canadian Task Force on the Periodic Health Examination (CTFPHE) has been collaborating in a binational effort to review evidence of clinical effectiveness and provide recommendations on preventive services.

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PREVENTION

Barriers to Effective Clinical Care

Preventive care services needs to become a part of routine clinical care. Some factors that may be responsible for the failure of clinicians to provide effective clinical preventive care services are:

- Insufficient time with patients to deliver the range of recommended preventive services
- Fragmentation of health care delivery
- Inadequate reimbursement for counseling services
- Lack of knowledge of services offered for preventive care
- Lack of knowledge or skepticism about the effectiveness of services
- Different recommendations from multiple sources
- Complications or adverse events of some prevention interventions, particularly when given to healthy individuals
- Economic implications – such as the cost or routing screening

Guide to Clinical Preventive Services: Second Edition (1996)

Barriers to Preventive Care Delivery (section i, pp 26,7 of 93 *)

Physicians are often faced with deciphering the significance of recommendations from different sources while weighing the pros and cons of screening and intervention side effects. This is a daunting task, especially when faced with an asymptomatic patient. For these reasons, patients must become partners in administering their care. They must be educated and made aware of the risk for progressing to clinical disease as well as the risks and side effects involved in screenings and interventions.

Guide to Clinical Preventive Services: Second Edition (1996)

Principal Findings of the U. S. Preventive Services Task Force (section I, pp 25,6 of 93*)

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PREVENTION

Guidelines for Prevention

- Prevention is most effective when accompanied by risk assessment.
- Routine visits for preventive care are important, however standardized procedures without attention to the risk profile of each patient has limited efficacy for prevention, neither is this cost effective.
- Both the frequency and the content of preventive services should be based on clinical evidence and individual risk profile of each patient.

Screening Tests:

Tests or standardized examination procedures to identify patients with disease. Non-standardized screening involves gathering patient history and information to assess risk or presence of disease symptoms.

Criteria of Effectiveness for screening tests: Accuracy of screening tests and effectiveness of early detection. [37]

Counseling Interventions:

Patient receives advice for personal behavioral modifications that can reduce the risk of subsequent illnesses. Most effective for primary prevention. Should be accompanied by risk assessment.

Criteria of Effectiveness for Counseling Interventions: Efficacy of risk reduction and effectiveness of counseling. [37]

Immunizations and Chemoprophylaxis:

Drugs or biologics taken by asymptomatic individuals to prevent the occurrence of disease. Primary prevention.

Criteria of Effectiveness for Immunizations: Efficacy of vaccine.[37]

Criteria of Effectiveness for Chemoprophylaxis: Efficacy of chemoprophylaxis and effectiveness of counseling.[37]

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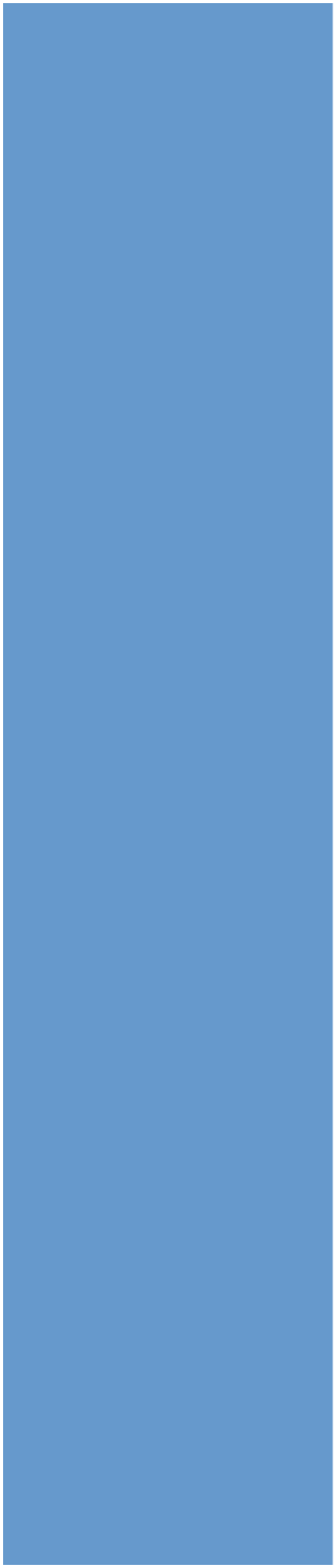

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PREVENTION

Screening

Screening is meant to identify individuals with a disease before clinical symptoms occur. Screening is effective if intervention at an early stage of the disease will be beneficial, and if the disease can be detected prior to this turning point. Collecting information on patient medical history and habits, while not considered screening, can prove valuable in the decision to screen a patient. Physicians must be attentive to the types of screening procedures and the criteria and factors that determine use and effectiveness of each procedure. A test with high sensitivity will yield many false positives resulting in unnecessary follow up screenings, which can be emotionally and financially costly for patients. A test with low sensitivity will not identify many with disease, while low specificity will fail to rule out many disease free individuals. This is an important factor to consider in regards to disease severity, as it may result in treatment delay. Another important factor to consider is the number needed to treat in order to have a positive outcome. How effective is the intervention and what are the side effects?

Guide to Clinical Preventive Services: Second Edition (1996)

Introduction - Methodology
pp xxli – xlvi (pp 39 – 47 of 93 *)

Read the following source for a review of these concepts and terms:

Guide to Clinical Preventive Services
pp xliii - liii (42-54 0f 93*)

- Prevalence
- Incidence

These terms are used to describe the burden of suffering. Know the difference between these terms

What are the criteria of effectiveness for the three categories of preventive services – counseling interventions, immunizations and chemoprophylaxis?

- Sensitivity

- Specificity

These relate to the accuracy of the screening test.


How are they related to false negatives, false positives, true negatives and true positives?


When is it better to use a test with a high sensitivity and low specificity? - high specificity and low sensitivity?


What are the ethical concerns of a test with low sensitivity? - low specificity?

- Positive predictive value


How can the prevalence of disease affect the PPV?

- Reliability
  - Inter-observer variation
  - Intra-observer variation

These terms relate to the reproducibility of a test. Know the difference between these two terms.


What are the different ways in which to test reliability?

- Treatment efficacy


How does this affect screening for disease?

- Lead time bias
- Length bias

These determine the apparent affect of screening on outcome


How would lead time bias be an issue in the case of mammograms and breast cancer?


How can length bias affect the apparent survival time of a patient with prostate cancer?

- Relative risk
- Attributable risk


Describe the focus of a highly effective intervention in terms of these risks. Imagine different scenarios – high prevalence, low morbidity and mortality vs. low prevalence, high morbidity and mortality.

Review the following:

- Randomized controlled trials
- Blinded trial
- Cohort study
- Case control study
- Ecologic study
- Ecologic fallacy
- Selection bias
- Observer bias
- Recall bias
- Confounding
- Statistical power

These refer to the various study types and factors that influence the quality of the evidence presented in these studies.

 What are the differences between the study designs?

 What factors may influence the choice in study designs?

 What is the measurement of risk for cohort studies? - case control studies?

 Which these studies can be done prospectively?

 How can you avoid the ecologic fallacy?

 Will a confounding factor strengthen or weaken your apparent measure of risk?

 What are some methods to control for confounding variables?

* Adobe Acrobat page numbers

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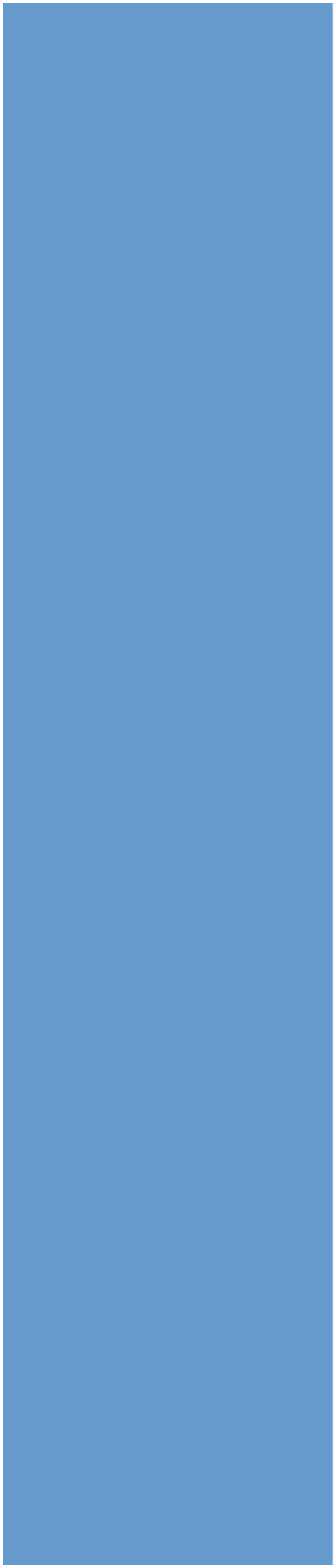

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PREVENTION

Patient Counseling

Patient education and counseling requires time. It involves gathering detailed information on factors affecting the patient which will in turn affect the patient's health. Gathering and reviewing the patient's medical history, the patient's family's medical history, lifestyle and behaviors affecting medical conditions, access to health services and willingness and/or ability to follow through with treatment recommendations are all necessary components of patient care.

Lack of research in the effectiveness of brief, direct counseling in the context of routine health care had been addressed by the USPSTF in the Guide to Clinical Preventive Services p32-33*. It examines information on counseling based on time, duration, setting, and personnel. For example, it addresses the effectiveness of lengthy, multiple visits with specially trained counselors vs. short direct counseling in the context of a routine visit.

"The most promising role for prevention in current medical practice may lie in changing the personal health behaviors of patients long before clinical disease develops." [6]

According to the CDC, most health burdens are linked to a few harmful behaviors. Behavioral modification on the part of the patient is crucial to effective primary prevention.

- Smoking: contributes to 1 out of every 5 deaths in the U.S. [38]
  - 150,000 deaths annually from cancer
  - 100,000 deaths annually from coronary artery disease
  - 23,000 deaths annually from cerebrovascular disease
  - 85,000 deaths annually from pulmonary disease such as chronic obstructive pulmonary disease and pneumonia
- Unsafe driving practice - lack of safety belt use and driving while intoxicated: [39]
  - Accounted for 41,000 deaths in 1992
- Physical Inactivity and dietary factors: [40 - 43]
  - Coronary atherosclerosis
  - Cancer
  - Diabetes

- Osteoporosis
- Hypertension

- High risk sexual practices: [44, 45]
  - Unintended pregnancies
  - STD's and HIV/AIDS

Tobacco, alcohol, elicit drug use, diet and activity patterns, motor vehicles, high risk sexual behavior were responsible for nearly half of all deaths in 1990. [46]

- Interventions geared toward personal health practices are likely to lead to substantial reductions in the incidence and severity of morbidity and mortality
- Primary prevention services that address the leading health indicators will improve overall health to a greater extent than secondary preventive measures such as screening for early disease
- Patients must begin to assume a larger role in maintaining their own health
- The clinician and the patient must share the decision making

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PREVENTION

Compliance

The role of patient compliance and participation in health promotion and disease prevention cannot be underestimated. According to the CDC, most health burdens are linked to a few harmful behaviors. Behavioral modification on the part of the patient is crucial to effective primary prevention.

The most difficult and perplexing task of any intervention based on behavioral change is sustained compliance. Can compliance be insured after the program is over? This is where patient education and counseling plays its role. When patients are given skills that they can use, in any situation, in any setting, and without the aid of “props”, this can be accomplished. Recommending the proper diet is laudable; however it is useless if the foods are unavailable in the community or too expensive for the patient to incorporate into a routine diet. The annual routine physical examination was proposed by the AMA in 1922 [47]. Since then, this has been revised with attention to evidence of behavioral patterns in high-risk groups [48]. The perfect routine examination can only be useful if the patient present. What influences the seemingly healthy individual to attend annual physical examinations?

Many individuals will only seek health services when ill or seriously injured. Once the clinical symptoms of the disease have developed the mission is to slow the progression of the disease, or to prevent further damage or co-morbid conditions from developing. Seldom can the disease process be fully reversed in the case of chronic illness.

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PREVENTION

Immunizations

Primary prevention – “vaccinations and immunoglobulins (passive immunization) taken by persons with no evidence of infectious disease”.

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PREVENTION

Chemoprophylaxis

Primary prevention – “use of drugs or biologics taken by asymptomatic persons to reduce the risk of developing a disease”

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PREVENTION

Appendix A:
PUT PREVENTION INTO PRACTICE: A STEP BY STEP GUIDE TO DELIVERING CLINICAL PREVENTIVE SERVICES

**These are additional resources for the student who is interested in exploring these concepts in greater detail. We do not consider this a part of the core. For greater detail see [ref].*

Develop a Preventive Care Protocol

Preventive Care Protocol:

A plan that specifies who should get which services and how often they should be delivered

Addressing and overcoming many of the barriers to preventive care can be done by developing a formal system to deliver preventive care.

The Agency for Healthcare Research and Quality (AHRQ), while addressing the barriers, provides a step by step guide for putting prevention in to practice.

Steps to implementing clinical preventive care into your system:

- Establish preventive care protocols
- Define staff roles for delivering and monitoring preventive care
- Determine patient and material flow
- Audit your delivery of preventive care continually
- Readjust and refine your delivery system and standards

ESTABLISH PREVENTIVE CARE PROTOCOLS

- Clinical practices use protocols from the delivery of preventive services as guides to adopting their own minimum acceptable standards of care.
- Determining which preventive care protocol to adopt should take into consideration the needs of the clinical setting. It should comply with the requirements of the health plans with which they contract.

DEFINE STAFF ROLES FOR DELIVERING AND MONITORING PREVENTIVE

CARE

- The task of delivering preventive care should be shared by all staff members – developing preventive care requires a team approach
- Preventive services are more effective when staff members take on coordinated and complimentary roles.

DETERMINE PATIENT AND MATERIAL FLOW

- Make each patient interaction valuable.
- Use effective information tools such as flow sheets and health risk profiles to determine patient needs and enhance patient contact.

AUDIT YOUR DELIVERY OF PREVENTIVE CARE CONTINUALLY

- How well is your practice delivering preventive care?

READJUST AND REFINE YOUR DELIVERY SYSTEM AND STANDARDS

- Use the results of your audits to upgrade your system of delivery
- Adjustments may include addition of services needed or improvement of documentation of delivery routines
- Include methods for identifying, reviewing and incorporating changes in recommendations for screenings and other preventive care services.

Steps Your Setting Can Take to Deliver Clinical Preventive Services

Assess Your Readiness for A Systems Change

- **Readiness Survey**
- **Worksheet for Assessing Organizational Climate**
- Elicit Patient Opinion

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Appendix B:
THEORETICAL MODELS

**These are additional resources for the student who is interested in exploring these concepts in greater detail. We do not consider this a part of the core. For greater detail see [ref].*

PRECEDE-PROCEED model

1. Social Diagnosis: Assess the quality of life
2. Epidemiological Diagnosis: Identify specific health goals and problems
3. Behavioral and Environmental diagnosis: Identify health related environmental and behavioral factors
4. Educational and Organizational diagnosis: Identify predisposing, reinforcing and enabling factors
5. Administrative and Policy diagnosis: Evaluate public policy
6. Implementation: Implement program
7. Process Evaluation
8. Impact Evaluation
9. Outcome Evaluation

Transtheoretical Model/Stages of Change
powerpoint
by Prochaska and DiClemente

Stages of Change

Precontemplation

Has no intention to take action within the next 6 months

Contemplation

Intends to take action within the next 6 months.

Preparation

Intends to take action within the next 30 days and has taken some behavioral steps in this direction.

Action

Has changed overt behavior for less than 6 months

Maintenance

Has changed overt behavior for more than 6 months.

Termination

Overt behavior will never return, and there is complete confidence that you can cope without fear of relapse.

Process of Change

Consciousness Raising

Involves providing information regarding the nature and risk of unsafe behaviors and the value and drawbacks of the safer behavioral alternatives.

Dramatic Relief

Fosters the identification, experiencing, and expression of emotions related to the risk the safer alternatives in order to work toward adaptive

Environmental Control

Allows the individual to reflect on the consequences of his or her behavior for other people. It can include reconsideration of perceptions of social norms and the opinions of people important to him or her.

Self Reevaluation

Entails the reappraisal of one's problem and the kind of person one is able to be, given the problem.

Commitment

Encourages the person to consider their confidence in their ability to change and their commitment to doing so.

Social Liberation

Seeking to help others with similar situations.

Helping Relationships

Assists the person In a variety of ways, including providing emotional support, modeling a set of moral beliefs, and serving as a sounding board.

Reward

Developing internal and external rewards and making them readily but

contingently available to improve the probability of the new behavior occurring or continuing.

Countering

Weighing the "pros" and "cons" of the behavior change. The challenge is to tip the balance in favor of making positive changes.

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Appendix C:
Understanding Research

**These are additional resources for the student who is interested in exploring these concepts in greater detail. We do not consider this a part of the core. For greater detail see [ref].*

Multivariable analysis: a primer for readers of medical research.

Ann Intern Med. 2003 Apr 15;138(8):644-50

Katz MH.

Many clinical readers, especially those uncomfortable with mathematics, treat published multivariable models as a black box, accepting the author's explanation of the results. However, multivariable analysis can be understood without undue concern for the underlying mathematics. This paper reviews the basics of multivariable analysis, including what multivariable models are, why they are used, what types exist, what assumptions underlie them, how they should be interpreted, and how they can be evaluated. A deeper understanding of multivariable models enables readers to decide for themselves how much weight to give to the results of published analyses.

Hill's Criteria of Causation

EVIDENCE FOR CAUSAL RELATIONSHIP

Koch's Postulates:

1. Organism is ALWAYS found with the disease. *
2. Organism is NOT found with any other disease. *
3. The organism, isolated from one with disease, and cultured through several generations, produces the disease (in experimental animals). *

HILLS CRITERIA:

Hills Criteria of Causation outlines the minimal conditions needed to establish a causal relationship

a. Strength of association

Measured by the relative risk or the odds ratio. The stronger the association, the more likely the relationship is causal.

b. Dose-response relationship

As the dose of exposure increases or decreases, the risk of disease also increases or decreases respectively. In some cases a threshold may exist where no disease develops up to a certain level; beyond that level, disease may develop.

c. Consistency with other findings

Consistent findings with other data is to be expected if the relationship is causal.

d. Temporality

Exposure to the factor believed to cause disease must occur BEFORE disease develops.

e. Intervention or Cessation of Exposure

The risk of disease declines when the factor believed to cause disease is removed or when exposure to such factor is reduced or eliminated.

f. Biological plausibility

Coherence with current body of biological knowledge.

g. Specificity

Specific exposure is associated with only one disease. *This is the weakest of all the guidelines and should probably be deleted from the list.* *

h. Experimental evidence or alternate explanations

The extent to which investigators have taken other possible explanations into account and the extent to which such explanations or considerations have been ruled out.

i. Replication of findings

Causal relationship found consistently in different studies and in different populations.

Reference: Leon Gordis. Epidemiology, 2nd Edition 2000. WB SAUNDERS COMPANY pp 192 – 195 * *direct quote*

About USPSTF

The New U.S. Preventive Services Task Force

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HYPERTENSION

Introduction

HYPERTENSION CHAPTER READINGS

Hypertension has been referred to as the silent killer because many people with hypertension have no symptoms. It is “the single most common condition for which U.S. adults go to the doctor”[7]. Hypertension is treatable and controllable, yet only 59% of cases are treated and 34% controlled[7]. Untreated hypertension often leads to cardiovascular disease, kidney disease and stroke. This chapter identifies strategies for primary and secondary prevention of hypertension and its resulting complications, with emphasis on appropriate risk assessment for behavioral interventions.

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Preventive Medicine & Health Promotion: Fourth Year Elective

Introduction

"Thanks in large part to the work of the USPTF, it is no longer questioned that appropriate preventive care belongs at the top of the list of effective interventions that must be available to all Americans. At a time when the leading causes of death are largely related to health-related behaviors – including tobacco use, poor diet, lack of physical activity, and alcohol use – it is particularly pertinent to highlight the importance of the health consequences of behavior. It remains extraordinarily important that physicians and other providers educate their patients about these matters."

GUIDE TO CLINICAL PREVENTIVE SERVICES, Second Edition
PHILIP R. LEE, M.D.
Assistant Secretary for Health
U.S. Department of Health and Human Services
Washington, DC

In July of 2000, Dr. David Satcher, the Surgeon General of the United States, declared a need for prevention education in the basic medical education curriculum[1]. The Liaison Committee on Medical Education (LCME) agreed with Dr. Satcher's recommendations, noting medical faculty's responsibility to create a curriculum that includes preventive medicine.

The value of prevention is increasingly being emphasized in medical educational institutions due to the growing prevalence and incidence of preventable diseases in the U.S. population. The **Preventive Medicine Electronic Curriculum's goals** are to provide up-to-date, clinically relevant information and cutting edge research results regarding the broad fields included under the rubric of Preventive Medicine.

In January of 2000, the U.S. Department of Health and Human Services released Healthy People 2010, a prevention agenda that identifies the most significant preventable health threats and provides a road map toward improving health based on scientific knowledge and strategic management. This initiative has specific objectives in 28 focus areas with two overarching goals to increase the quality and years of healthy life and to eliminate Health Disparities.

The Guide to Clinical Preventive Services, Second edition was developed and published in 1996 by the U.S. Preventive Services Task Force (USPTF). The Guide was established to rigorously evaluate clinical research in order to provide science –based preventive recommendations for services including screening tests, counseling, immunizations, and chemoprevention. The mission of the task force served by the Guide is to 1. Evaluate the benefits of individual services, 2. Create age-, gender-, and risk-based recommendations about services that should routinely be incorporated into primary medical care, and 3. Identify a research agenda for clinical preventive care. This

second edition includes more than 200 services offered in primary care.

These prevention resources provide the basis for clinical guidelines presented in this course as they present an ideal platform for launching a basic curriculum that includes the core competencies in health promotion and disease prevention set forth by the American Association of Teachers of Preventive Medicine. The course material is structured toward our main objectives to provide guidelines and information for incorporating clinical preventive services into medical practice. Clinical preventive services are relevant to all disciplines of medicine; however it is most effective at the primary level mainly served by family practice, internal medicine, ob-gyn, and pediatric services.

One exciting feature of this curriculum is that it provides the Preventive Medicine Vertical Theme of the CWRU medical school curriculum in an electronic format. See **course instructions** and **course requirements** for information on completing this course.

1. Satcher, D. **Academic Medicine. 2000;75(7):S1**

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Prevention Website PDF

Please read the Course Instructions *carefully*.

*If you understand and agree to the course requirement, choose **I ACCEPT** (see below) which will take you directly to the **Pre-Course Survey**.*

*If you do NOT understand or accept the course requirements, please choose **I DO NOT ACCEPT** and **contact a faculty member** regarding your questions.*

You only need to choose I ACCEPT once.

In order to gain access to the surveys and exam from an off-campus location,

for the **user name** *entry you must use:* **SOM\user name**

Enter **password** *as usual.*

Course Instructions | Course Requirements
Module Outline Suggestions | How to Create a Hyperlink | Deadlines
Module Topic Suggestions in Clinical Areas
Consent and Waiver Form

Course Instructions

1. COURSE MATERIALS

   All required reading materials are accessible online. Required readings are designated by  , and are linked to online source documents. Students may also review materials listed in the references section for the course; these materials can be made available upon request or through the Health Sciences Library.

2. REVIEW QUESTIONS

   Review questions are placed within the chapters for your benefit. Please attempt these questions before moving on to the next section.

3. COURSE SURVEYS

   To evaluate this course, we need your comments and suggestions. Please complete and submit the pre and post-course surveys. Your answers to the survey will not affect your grade for the course.

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Course Requirements

In order to receive credit for the course the following requirements must be met:

*****Before beginning the course ALL students must contact a faculty member to discuss the following course requirements.**

1. All students must complete the **pre-course survey** before beginning the course.

2. In order to access the pre-course survey, please read the course instructions and if you agree to the terms of the course, then choose "I ACCEPT" at the end of this page. This will take you to the pre-course survey. If you do not accept the terms of the course, or if you have questions, please choose "I DO NOT ACCEPT" and contact a faculty member regarding your concerns. You only need to choose "I ACCEPT" once.

3. All students must complete the **eEXAM** upon completion of the course. You must contact a **faculty member** for your password in order to access the exam.

4. Students may choose to contribute to the development of the curriculum in Preventive Medicine and Health Promotion through creation of an additional educational module in an area of interest. The topic of choice must be approved by one of the **faculty members** for the course. Students contributing to the course curriculum will be considered for honors credit.

   Students who choose to contribute to the curriculum must sign a **consent and waiver** in order for their materials to be added to the course. Please print and sign this consent and waiver form and take it to **Celena Townsend** in Student Affairs, Room E421.

5. All students must complete the **post-course survey** upon completion of the course. You may access the post-course survey through the link provided in the Frame of this web site.

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Module Outline Suggestions

Here are some suggestions for what areas to cover in your module. These are suggestions and not meant to be a rigid guideline; you may add or delete topics to suit your module.

1) Introduction to Your Topic

2) Epidemiology, including:

   i) Prevalence

   ii) Incidence

   iii) Risk factors

   iv) Health Risks

   v) Morbidity and Mortality

   vi) Screening

   vii) Diagnosis

3) Co-morbid Conditions

4) Cost Burden

5) Prevention Programs Available

6) Lifestyle and Behavioral Modification

7) Primary Prevention

8) Secondary Prevention

9) Key Findings

Please provide references along with your module

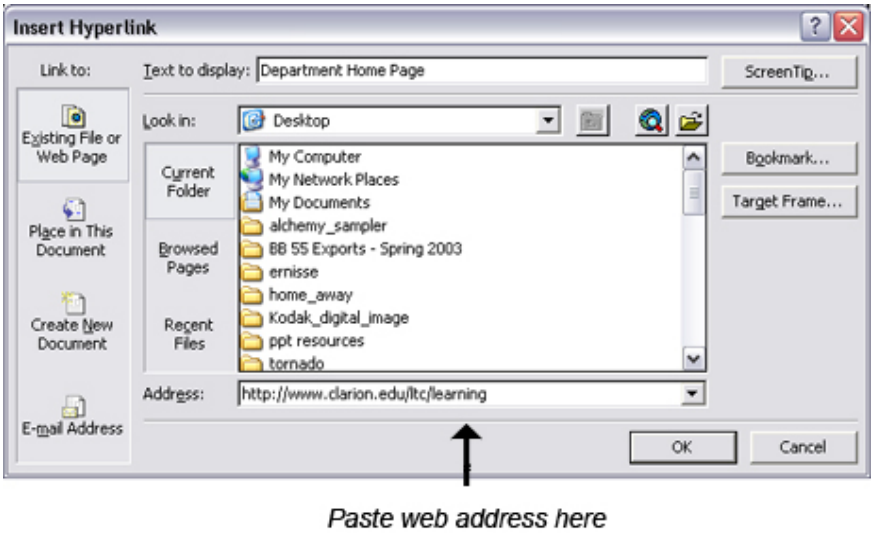
Please provide Pub Med links for all articles referenced in your module

TOP

How to Create a Hyperlink

As you are developing educational content or finding resources for your module, try to document reference materials – such as abstracts or informational websites. Once you find the abstract for your citation in PubMed or an interesting web resource:

1. Copy the web address you wish to link to.
2. In your Word document, select the text you wish to create a hyperlink to.
3. With the arrow on this text, right click on the mouse and choose "hyperlink" (or Cntrl + K).
4. Paste the web address into the address text box.
5. Choose "OK".



Paste web address here

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Deadlines

Topic selection	due by the 8th	(or the end of the first week)
Draft or Outline	due by the 15th	(or the end of the second week)
Final Module	due by the 28th	(or the end of the fourth week)

Please email your topic selections to **wrightlit@aol.com**

TOP

Module Topic Suggestions in Clinical Areas

- Cardiovascular Disease
- Diabetes
- Cancer
  - Lung
  - Colon
- Asthma
- Infectious Disease
  - HIV
  - STI's
- Substance Abuse
- Unintentional Injuries
- Obesity
  - Diet and Nutrition
  - Physical Activity
- Tobacco Prevention/Smoking Cessation

TOP

I have read the course instructions and I understand what is required for this course (this button will take you directly to the pre-course survey).

I ACCEPT

I have read the course instructions, but I still do NOT understand what is required for this course. (Please contact a faculty member to clarify your questions.)

I DO NOT ACCEPT

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Goals and Learning Objectives

Online Preventive Medicine and Health Promotion Elective

1. Provides students with baseline understanding of principles of prevention and health promotion and assists students in reconciling conflicting recommendations and guidelines among expert organizations.
2. Describes basic concepts in epidemiology as they relate to clinical prevention and health promotion, including risk factor assessment, risk stratification, and testing features (sensitivity, specificity, positive and negative predictive value).
3. Distinguishes between primary, secondary and tertiary preventive services.
4. Outlines gender and age-specific recommendations for disease prevention and health promotion.
5. Identifies and develops strategies that address patient, physician, and systems-level barriers to delivery of preventive care.
6. Identifies and assess the quality of resources for self and patient education on behavioral modification strategies.
7. Encourages students to apply and share knowledge gained through the development of an educational module about disease prevention and health promotion in an area of interest.
8. Helps students apply knowledge of prevention and health promotion in a broad range of settings.
9. Provides necessary tools and information for students to counsel patients effectively on general and condition-specific behavioral modification strategies.

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Glossary of Terms

This glossary is a compilation of several glossary sites available online. Definitions other than the ones referenced may be used in other contexts. The sites used are listed below.

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50th (median) Percentile 4

75th Percentile 4

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Analytic Epidemiology 6

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Apparent Prevalence (Test Prevalence) 3

Applied Epidemiology 6

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Attributable Proportion 6

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Glossary Sites:

1. **Terminology Specific to Epidemiology**, Washington State University

2. **Clinical Study Designs and Methods Terminology**, Washington State University
3. **Terminology Specific to Clinical Testing**, Washington State University
4. **Experimental Design and Statistics Terminology**, Washington State University
5. **Noncommunicable Disease Prevention and Health Promotion Glossary Site**, World Health Organization
6. **Reproductive Health Glossary Site**, Centers for Disease Control and Prevention

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eExam Log In:

This exam is available for students registered for this course elective.

Students who are ready to take this exam, click on the button below.

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Module 4: Disease Prevention

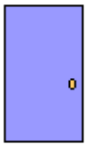
Introduction:

From Module 4: Disease Prevention Introduction

In this module, you will learn about your patient's lives outside of the physician's office. Topics like childhood drownings and increasing physical activity should be addressed in the context of a patient's real life. For this reason, the interface for Module 4 is the townhouse complex where your patients live.

The practice of primary care medicine is a comprehensive endeavor that encompasses not only the identification and treatment of disease but the primary prevention of disease as well as the prevention of their secondary complications. In this module our patients will highlight several areas of preventive medicine that are commonly addressed by primary care physicians.

ENTER



Module 4
Community Primary Care Preceptorship

Virtual Patient Scenarios

This section includes some patient scenarios that address some of the main barriers to effective clinical preventive care.

These barriers are:

- Insufficient time
- Lack of knowledge of services offered for preventive care
- Lack of knowledge or skepticism about the effectiveness of services
- Different recommendations from multiple sources
- Inadequate reimbursement for counseling services
- Fragmentation of health care delivery
- Complications or adverse events of some prevention interventions, particularly when given to healthy individuals

- Economic implications - such as the cost or routing screening

As you read each scenario, try to formulate your own answers before viewing the answers provided. Don't assume that your ideas are incorrect if they do not match the answers provided. If you have any questions about this section, or about a particular scenario please email then to **smm39@case.edu**

These scenarios are provided for practice purposes only.

Cost Barriers System-Level

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- CANCER
- Children and Adolescents
- NUTRITION & EXERCISE
- DIABETES
- LUNG DISEASES
- HEALTH CARE FOR THE ELDERLY
- HYPERTENSION AND STROKE
- PREVENTION FOR MIGRANT/SEASONAL WORKERS
- PREVENTION FOR LATINOS
- WOMEN'S HEALTH
- OTHER PREVENTION SITES
- Interventions To Improve The Delivery Of Preventive Services

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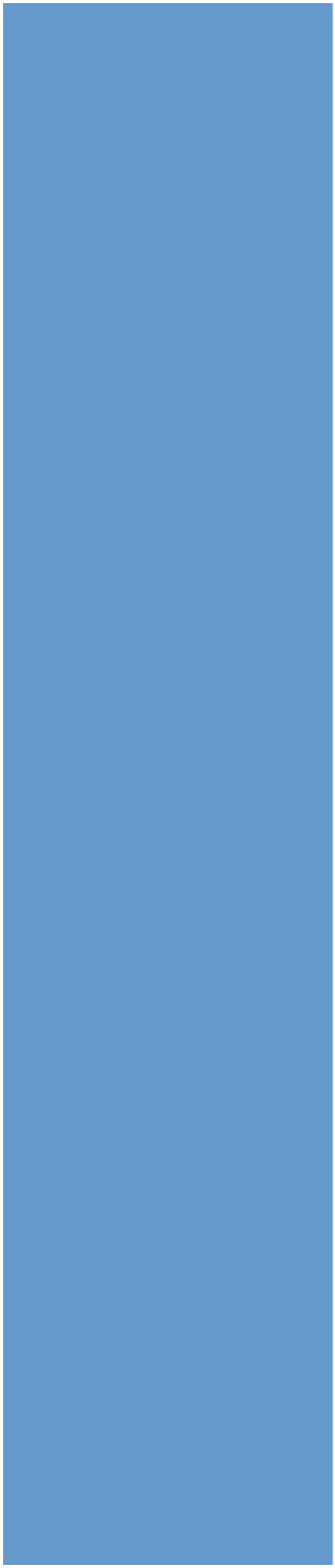

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Patient Resources:

- A Touch of Soul

Recipes lower in salt, fat, and cholesterol

- Nutrition and Exercise
- Heart Disease, Diabetes and Hypertension
- Cancer
- Children and Adolescents
- OTHER PREVENTION SITES

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Student Resources and Updates

News

New modules have been added to the course!!!

CVD Module 1:	Women's Cardiovascular Health	by Anupama Rao, MD
Cancer Module 1:	Breast Cancer	by Ann Rivera, MD
INF DIS Module 1:	Childhood Immunizations	by Karen Goda, R.N.

At Your Request...

- We have added a comprehensive list of chapter readings at the beginning of each chapter.

PREVENTION CHAPTER READINGS

HYPERTENSION CHAPTER READINGS

- A PDF of the Preventive Medicine website has been added to the left menu so you can save it to your desktop.

Course Reviews

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You must have access to view the exam and survey results.

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Choose:

1. Check Exam Performance from the left frame
2. Year IV
3. Preventive Medicine
4. 2/25/04 Preventive Medicine
5. Then choose your desired report listed on right frame

Faculty Survey Results:

GO TO SURVEY

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Choose:

1. Report from the left frame
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3. Single user report in the Report Content box
4. Find the Preventive Medicine Pre-Course or Post Course survey in the Available Surveys box
5. Select your Respondent

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HYPERTENSION

Epidemiology

Risk Factors:

Life style modifications for the prevention and control of hypertension have been shown to be effective, and to reduce the risk of future cardiovascular disease. Even when lifestyle modifications alone are not adequate, they may reduce the number and dosage of antihypertensive medications needed to manage the condition once diagnosed. The CDC lists some "**Leading Health Indicators**" that are instrumental in targeting behavioral risk factors for disease.

Tobacco

Smoking cessation should be the first risk factor addressed. Above all others, smoking cessation is the most important behavior modification for lowering the risk of cardiovascular disease, even more so than normalizing blood pressure.

Overweight and Obesity

- Excess body weight or a BMI of >27 is correlated with increased blood pressure, especially in the deposition of excess fat in the upper part of the body – visceral or abdominal, evidenced by waist circumference of >34in (85cm) in women and >39in (98cm) in men.
- Weight reduction is correlated with reduction in risk and the benefits of weight reduction persist long after the active intervention.[5]
- Weight reduction can enhance the effect of antihypertensive medication.
- Obesity is more prevalent among lower socioeconomic groups and more prevalent among African American and Mexican than whites – especially women.
- Among African American and Mexican 80% more women than men are overweight

Healthy weight management begins in childhood. It is far more difficult to lose weight once obesity is established than to cultivate and maintain healthy habits and behaviors that will result in a sustained healthy weight. Obesity is a result of many factors that can be altered and some that cannot. Social, behavioral, cultural, environmental, and physiological factors can all be changes to some extent. While genetic predispositions cannot be changed, one can take measures to actively combat the inevitable. In severe situation, it is highly recommended that persons

seek the advice and help of a health care provider in order to negotiate a plan for dietary modifications and exercise.

Weight loss interventions produce benefits that persist long after the cessation of the active intervention.

Physical Inactivity

- Lack of time, access to convenient facilities, lack of safe environments in which to be active
- People with lowest physical activity: women, people with lower incomes, less education, African Americans, Hispanics, North Eastern and Southern states, people with disabilities, people >75 years.
- Sedentary individuals have a 20 – 50% greater risk than their active counterparts of developing hypertension
- 30 – 45 minute brisk walking most days of the week can significantly reduce risk of hypertension

Alcohol

A decrease in alcohol consumption is associated with reduction in blood pressure. This association is dose dependent.

Dietary Sodium

- Sodium added to processed foods accounts for approximately 80% of overall sodium intake.
- Simple results can be achieved by avoiding foods with more than 300mg of sodium per portion
- Data from controlled trials suggest that a reduction of 40 to 50mmol/d, which is about ¼ to 1/3 of the usual daily intake, would result in a "4 – 6mm Hg fall in systolic blood pressure among hypertensives and a 1 – 2mm Hg fall in blood pressure among normotensives"

"Sodium reduction [is] associated with a small but significant reduction in systolic blood pressure in normotensive persons" [13]

Salt Sensitivity

Almost 2/3rds of hypertensive African Americans are salt sensitive, compared to less than half of non-African Americans with hypertension.

African Americans, elderly individuals, diabetics, and Individuals with insulin resistance are more susceptible to salt sensitivity of blood pressure regulation.

Potassium Intake

"There is some evidence that a combination of too much sodium and too little

potassium may be the culprit in hypertension, rather than excessive sodium intake alone."

Potassium supplementation has been reported to be more effective in those with higher levels of sodium intake; however it cannot be recommended for prevention of hypertension in the general population.

Calcium and Magnesium Intake

Evidence exists that low calcium and magnesium intake is associated with higher blood pressure however; increasing calcium intake provides minimal results, and there is no convincing evidence that increasing magnesium is effective in preventing or lowering blood pressure.

Stress

Although stress can raise blood pressure acutely, there is no solid evidence that stress management is effective in preventing and treating high blood pressure.

Lack of Clinical Preventive Care

People must first have access to clinical preventive services in order to receive the benefits of early detection and treatment.

- PATIENT BARRIERS:
    - Lack of knowledge, skepticism about effectiveness of prevention, lack of usual source of primary care, lack of money to pay for preventive care
- HEALTH PROVIDER BARRIERS:
    - Lack of time, lack of training in prevention, lack of perceived effectiveness of selected preventive services, practice environments that fail to facilitate prevention, lack of reimbursement for more consistent counseling about behavioral risk factors such as diet and exercise
- SYSTEM BARRIERS
    - Lack of resources or attention devoted to prevention. Lack of coverage or inadequate reimbursement for services and lack of systems to track quality care.

Groups at Highest Risk for Hypertension are those with:

-Family history of high blood pressure

-African American or Black ancestry

-Overweight or obesity

-Sedentary lifestyle

-Excess intake of dietary sodium

-Insufficient intake of potassium

-Excess consumption of alcohol

-Prehypertension

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HYPERTENSION

Secondary Prevention

Definition of Hypertension

Hypertension is defined as SBP of 140 mm Hg or greater, DBP of 90 mm Hg or greater, or taking antihypertensive medication[1].

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HYPERTENSION

Secondary Prevention

Classification

Classification of hypertension is essential in assessing the risk of cardiovascular disease, stroke or end stage organ damage.

- "The risk of CVD beginning with 115/75 mm Hg doubles with each increment of 20/10 mm Hg"

Recommendations for appropriate pharmacologic treatment and lifestyle modifications are guided by classification of hypertension.

- Encourage healthy lifestyle for **ALL** individuals *[emphasis added]*
- For stage 1 hypertension without compelling indications, recommendations include thiazide-type diuretics for most [3]. (See Table 1 for more recommendations from JNC 7)

Click on the image to open a larger version.

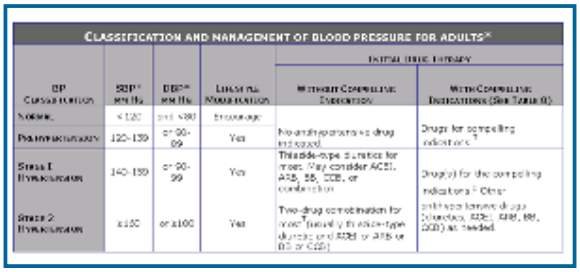

Table 1.

DBP, diastolic blood pressure; SBP, systolic blood pressure.

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta blocker; CCB, calcium channel blocker.

* Treatment determined by highest BP category.

† Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension

‡ Treat patients with chronic kidney disease or diabetes to BP goal of <130/80 mm Hg.

The classification is based on the average of two or more properly measured, seated BP readings on each of two or more office visits.

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HYPERTENSION

Secondary Prevention

PREVENTION:
Risk Stratification and Treatment Recommendations

The risk of cardiovascular disease is not only measured by the level of blood pressure, but also the presence of target organ damage and other risk factors such as smoking, dyslipidemia, and diabetes.

Persons with stage 1 hypertension in risk group A are candidates for vigorous lifestyle modification with vigilant blood pressure monitoring. If global blood pressure is not received, then pharmacologic therapy is needed.

Persons with stage 2 or stage 3 hypertension in risk group A should receive drug therapy.

Group B contains the majority of patients with high blood pressure. This included patients without cardiovascular disease or target organ damage, but one or more of the risk factors shown in table 4 (but not diabetes mellitus). If multiple risk factors are present, antihypertensive drugs should be considered as initial therapy. Lifestyle modification and management of reversible risk factors should be strongly recommended.

Group C included patients with clinically manifest cardiovascular disease or target organ damage. These patients, as well as patients with high-normal blood pressure levels, renal insufficiency, heart failure, or diabetes mellitus should be considered for prompt pharmacologic therapy. Appropriate lifestyle modifications should always accompany treatment.

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HYPERTENSION

The Science Base for Disease Prevention

DASH-Sodium

- Looked at the effect on blood pressure of a reduced dietary sodium intake of three sodium levels. The three sodium levels were: a higher intake of about 3,300 [mg] per day (the level consumed by many Americans); an intermediate intake of about 2,400 [mg] per day; and a lower intake of about 1,500 [mg] per day.
- Results showed that reducing dietary sodium lowered blood pressure for both eating plans. At each sodium level; blood pressure was lower on the DASH eating plan than on the other eating plan. The biggest blood pressure reductions were for the DASH eating plan at the sodium intake of 1,500 [mg] per day. Those with hypertension saw the biggest reductions, but those without it also had large decreases.

Effect of dietary sodium intake on blood lipids: results from the DASH-sodium trial

Full Text PDF

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HYPERTENSION

The Science Base for Disease Prevention

PREMIER Clinical Trial

- Objective: To compare the effect on blood pressure of 2 multicomponent, behavioral interventions.
- Randomized Clinical Trial with enrollment at 4 centers. Mean age among 810 adults was 50 years; 62% women; 34% African American. Study included individuals with above optimal blood pressure including stage 1 hypertension, according to JNC VI classification; and those not taking antihypertensive medications.
- Three intervention groups: (1) Established – a behavioral intervention that implemented established recommendations (2) Established plus DASH – also implemented the DASH diet; and (3) Advice only (comparison group)
- Both behavioral interventions significantly reduced weight, improved fitness, and lowered sodium intake. The established plus DASH intervention also increased fruit, vegetable, and dairy intake
- After subtracting change in the advice only group, the mean net reduction in SBP was 3.7 mm Hg in the established group and 4.3 mm Hg in the established plus DAS group. These results were significant at .05 level. Difference between established and established plus DASH group was not significant.
- Compared with baseline hypertension prevalence of 38%, the prevalence of hypertension at 6 months was 26% in the advice only group. 17% in the established group, and 12% in the established plus DASH group. All differences were significant except between the established and established plus DASH group.

Effects of Comprehensive Lifestyle Modification on Blood Pressure Control.
Main Results of the PREMIER Clinical Trial.

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HYPERTENSION

The Science Base for Disease Prevention

Losartin Intervention for Endpoint Reduction in Hypertension Study (LIFE)

Overview:

Double-blind, randomized trial to compare the effects of losartan and atenolol on cardiovascular morbidity and mortality in high-risk patients with hypertension and left ventricular hypertrophy (LVH)

Summary and Conclusions:

- Losartan-based compared with atenolol-based antihypertensive therapy was associated with:
    - Reduced cardiovascular morbidity and mortality (-13%)
    - Fewer strokes (-25%)
    - Similar blood pressure reduction
- Losartan reduced the rate of new-onset diabetes (-25%)
- In the diabetic subgroup, losartan reduced the rate of:
    - Combined endpoint of cardiovascular morbidity and mortality (-25%)
    - All-cause mortality (-39%)
- Losartan reduced the combined risk of cardiovascular morbidity and mortality compared to atenolol with benefits not explained by blood pressure reduction
- Losartan reduced the rate of new-onset diabetes
- Losartan was significantly better tolerated than atenolol
- Among diabetics, losartan reduced cardiovascular morbidity and mortality

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HYPERTENSION

The Science Base for Disease Prevention

LIFE Study Isolated Systolic Hypertension (ISH) Subgroup

Overview:

Double-blind, randomized trial to compare the effects of losartan and atenolol on cardiovascular morbidity and mortality in patients with isolated systolic hypertension who were a subgroup of high-risk hypertensive patients in the LIFE study (n=9,193)

Summary and Conclusions:

- Losartan compared with atenolol provided better protection against cardiovascular (CV) mortality (p=0.01) and stroke (P=0.02) in patients with isolated systolic hypertension (ISH)
- Losartan induced stronger regression of left ventricular hypertrophy (LVH) than atenolol
    - Cornell VD Product P<0.001
    - Sokolow-Lyon P<0.001
- Losartan compared to atenolol reduced the rate of new onset of diabetes (P=0.04)
- The interaction between treatment with losartan and isolated systolic hypertension (ISH) suggested a particular cardiovascular protective effect of losartan in ISH
- Losartan achieved the same level of blood pressure reduction as atenolol
- These results suggest that losartan-based compared to atenolol-based therapy may be preferred in patients with isolated systolic hypertension and left ventricular hypertrophy.

Trials in isolated systolic hypertension: an update

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HYPERTENSION

The Science Base for Disease Prevention

Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) *powerpoint*

Treatment and complications among 50 – 60 million people in the United States with hypertension are estimated to cost $37 billion annually, with antihypertensive drug costs alone accounting for an estimated $15.5 billion per year. (reference)

ALLHAT was designed to determine whether the occurrence of fatal CHD or nonfatal myocardial infarction is lower for high risk patients treated with a CCB, and ACE, or an alpha blocker each compared with diuretic treatment.

Major outcomes in high-risk hypertensive patients randomized to angiotensin-converting enzyme inhibitor or calcium channel blocker vs diuretic: The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT).

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ALLHAT Blood Pressure Component Doxazosin Arm

- The **A**ntihypertensive and **L**ipid-**L**owering Treatment to Prevent **H**eart **A**ttack **T**rial (ALLHAT) is a double-blind, active-controlled trial that enrolled 42,448 patients, ≥55 years old, with hypertension (SBP ≥140 mmHg and/or DBP ≥90 mmHg) and at least 1 other coronary heart disease (CHD) risk factor
- ALLHAT was designed to determine the differences in the incidence of the primary outcome between treatment with diuretic (chlorthalidone) and 3 other agents, doxazosin, lisinopril, and amlodipine
- The primary outcome was a composite of fatal CHD and non-fatal myocardial infarction (MI)
- Secondary outcomes were all-cause mortality, stroke, and all major cardiovascular disease (CVD) events
- The doxazosin treatment arm of the blood pressure component was stopped in January 2000, resulting in a median follow-up of 3.3 years for doxazosin compared to chlorthalidone

The ALLHAT Group. JAMA. 2000;283(15):1967-1975.

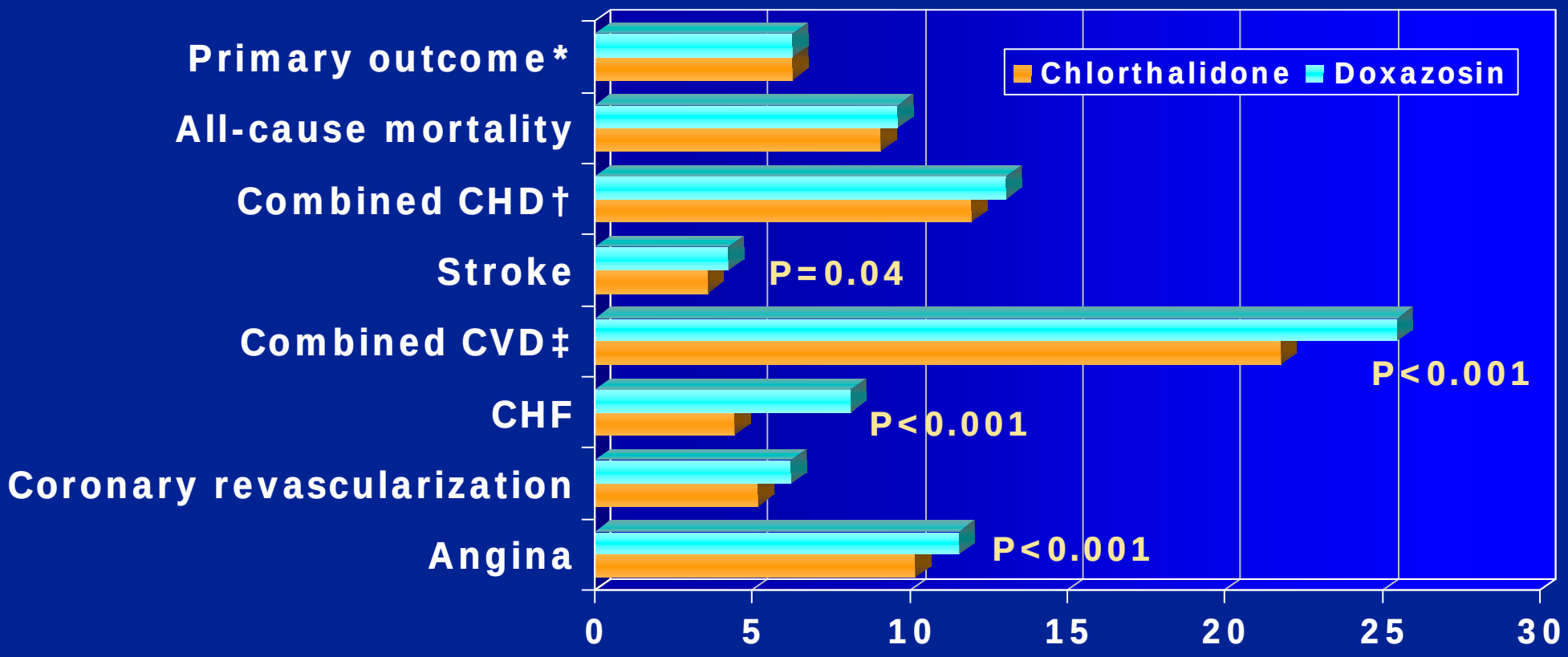
ALLHAT Blood Pressure Component Doxazosin Arm Outcomes

	4-year rate per 100 (SE)			
	Chlorthalidone (n=15,268)	Doxazosin (n=9,067)	Relative Risk (95 % CI)	P value
Primary outcome*	6.30 (0.36)	6.26 (0.30)	1.03 (0.90-1.17)	0.71
All-cause mortality	9.08 (0.35)	9.62 (0.49)	1.03 (0.90-1.15)	0.56
Combined CHD†	11.97 (0.38)	13.06 (0.53)	1.10 (1.00-1.12)	0.05
Stroke	3.61 (0.22)	4.23 (0.32)	1.19 (1.01-1.40)	0.04
Combined CVD‡	21.76 (0.49)	25.45 (0.68)	1.25 (1.17-1.33)	<0.001
CHF	4.45 (0.26)	8.13 (0.43)	2.04 (1.79-2.32)	<0.001
Coronary revascularization	5.20 (0.27)	6.21 (0.39)	1.15 (1.00-1.32)	0.05
Angina	10.19 (0.35)	11.54 (0.48)	1.16 (1.05-1.27)	<0.001

*Coronary heart disease (CHD) and non-fatal myocardial infarction (MI)
†Combined CHD consists of CHD death, non-fatal MI, coronary revascularization procedures, and angina with hospitalization
‡Combined cardiovascular disease (CVD) consists of CHD death, nonfatal MI, stroke, coronary revascularization procedures, angina, congestive heart failure (CHF), and peripheral arterial disease

The ALLHAT Group. JAMA. 2000;283(15):1967-1975.

ALLHAT Blood Pressure Component 4-Year Outcome Rates Per 100



*Coronary heart disease (CHD) and non-fatal myocardial infarction (MI)

†Combined CHD consists of CHD death, non-fatal MI, coronary revascularization procedures, and angina with hospitalization

‡Combined cardiovascular disease (CVD) consists of CHD death, nonfatal MI, stroke, coronary revascularization procedures, angina, congestive heart failure (CHF), and peripheral arterial disease

The ALLHAT Group. JAMA. 2000;283(15):1967-1975.

ALLHAT BP Component Doxazosin Arm Relative Risk For Diabetics*

	Relative risk (95% CI)*	P value
Combined CVD	1.25 (1.17-1.33)	<0.001
Diabetes	1.24 (1.12-1.38)	<0.001
No diabetes	1.26 (1.16-1.37)	<0.001
CHF	2.04 (1.79-2.32)	<0.001
Diabetes	2.14 (1.76-2.59)	<0.001
No diabetes	1.99 (1.65-2.37)	<0.001

*for doxazosin compared to chlorthalidone, as of December 1999

The ALLHAT Group. JAMA. 2000;283(15):1967-1975.

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HYPERTENSION

The Science Base for Disease Prevention

IRbesartan MicroAlbuminuria Type 2 Diabetes in Hypertensive Patients Study (IRMA II) *powerpoint*

Overview:

Randomized multi-site, double-blind, placebo-controlled study to evaluate the renal protective effect of the angiotensin II receptor antagonist irbesartan in hypertensive patients with type 2 diabetes and microalbuminuria

Summary of Important Findings:

- Irbesartan significantly reduces the rate of progression from microalbuminuria to diabetic nephropathy
- Renoprotection from irbesartan inpatients with type 2 diabetes and microalbuminuria is independent of its blood pressure lowering effect
- Antihypertensive treatment has a renoprotective effect in hypertensive patients with type 2 diabetes and microalbuminuria.

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Benefit of Angiotensin Receptor Blockers in Diabetes: Important Findings of 3 Major Clinical Trials

- RENAAL (2001)
  - The angiotensin receptor blocker losartan compared to placebo reduced the risk of diabetic nephropathy developing to renal failure
- **IRMA II (2001)**
  - **Higher doses of the angiotensin receptor blocker irbesartan reduced the risk of progression of renal insufficiency**
- IDNT (2001)
  - The angiotensin receptor blocker irbesartan compared to the calcium channel blocker amlodipine provided better renal protection in hypertensive type 2 diabetics, reducing the chance of diabetic nephropathy developing to renal failure

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www.hypertensiononline.org

The IRbesartan MicroAlbuminuria Type 2 Diabetes In Hypertensive Patients Study

IRMA II Objectives

- Randomized multi-site, double-blind, placebo-controlled study to evaluate the renal protective effect of the angiotensin II receptor antagonist irbesartan in hypertensive patients with type 2 diabetes and microalbuminuria

Population

- 590 patients (30 to 70 years old)
  - Type 2 diabetes
  - Hypertension (a mean systolic BP >135 mmHg or a mean diastolic BP >85 mmHg, or both, on 2 of 3 consecutive measurements)
  - Persistent microalbuminuria
    - Albumin excretion rate of 20 to 200 μg/min in 2 of 3 samples
    - Serum creatinine concentration of no more than 1.5 mg/dL for men and 1.1 mg/dL for women

Slide Source
HypertensionOnline
www.hypertensiononline.org

Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

IRMA II Endpoints

Primary Endpoint

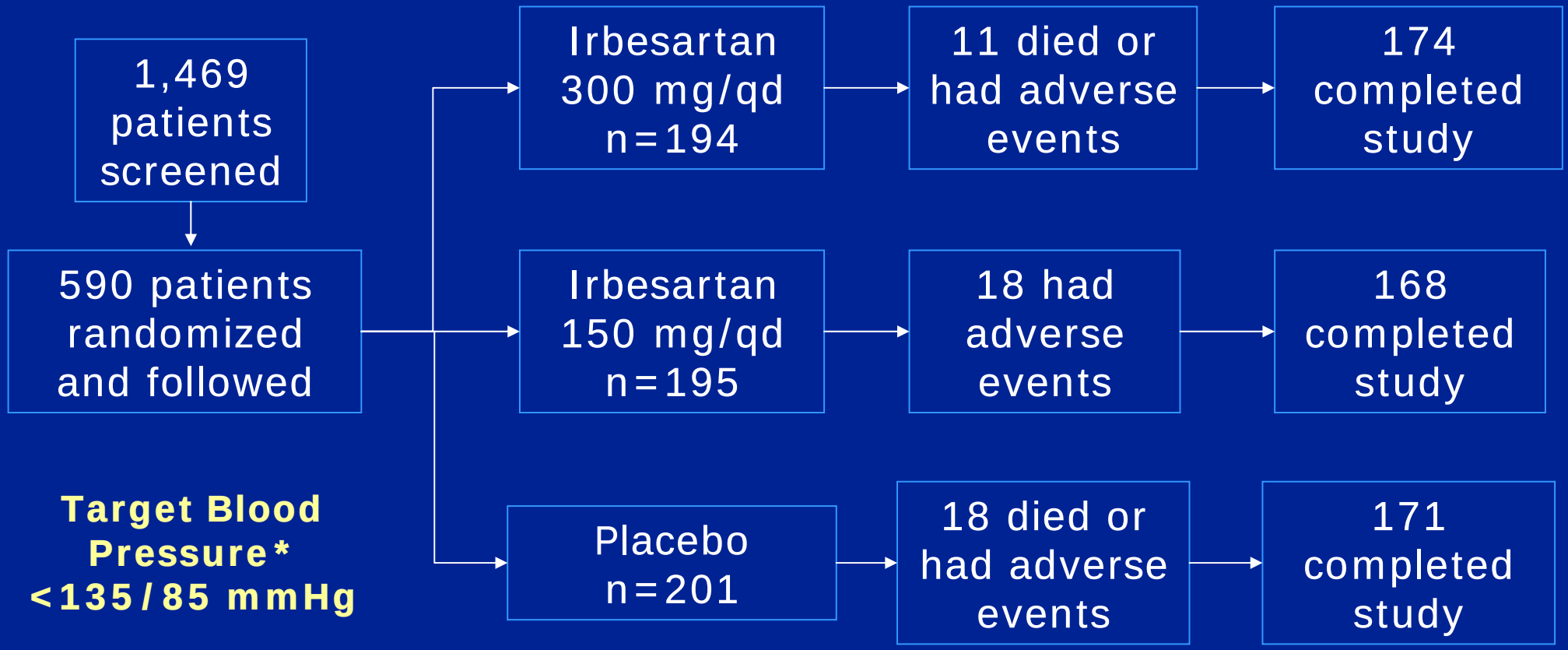
- Onset of diabetic nephropathy
  - urinary albumin excretion rate greater than 200 μg per minute and at least 30% higher than baseline in at least 2 consecutive measurements

Secondary Endpoints

- Changes in level of albuminuria
- Changes in creatinine clearance
- Restoration of normoalbuminuria
  - urinary albumin excretion rate of <20 μg/min by last exam

Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

IRMA II Study Design



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Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

IRMA II Baseline Characteristics*

	Placebo n=201	Irbesartan 150 mg n=195	Irbesartan 300 mg n=194
Mean age (yrs)	58.3	58.4	57.3
Male (%)	68.7	66.2	70.6
Mean Systolic BP (mmHg)	153	153	153
Mean Diastolic BP (mmHg)	90	90	91
Mean BMI (kg/m²)	30.3	29.9	30.0
Mean urinary albumin excretion (μg /min)	54.8	58.3	53.4
Mean serum creatinine (mg/dl)			
Men	1.1	1.1	1.1
women	0.9	0.9	1.0
Mean glycosylated hemoglobin (%)	7.1	7.3	7.1

*The differences between the treatment groups were not statistically significant

Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

IRMA II Irbesartan vs Placebo Primary Endpoint at 2 Years

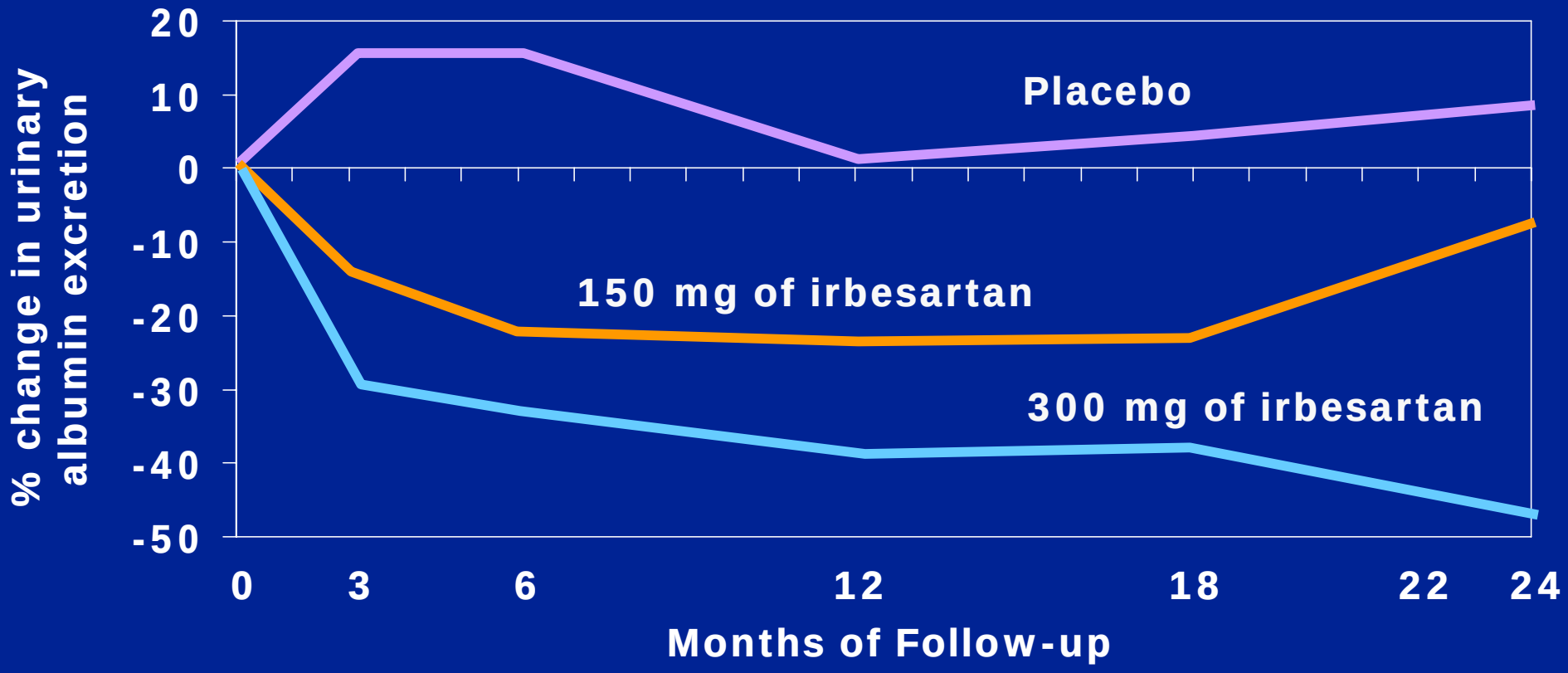
	Total # of Patients	Progression to Nephropathy		Unadjusted Risk Reduction	P Value†	Adjusted* Risk Reduction	P Value†
		n	%				
300 mg Irbesartan	194	10	5.2	70%	<0.001	68%	<0.001
150 mg Irbesartan	195	19	9.7	39%	0.08	44%	0.05
Placebo	201	30	14.9	-	-	-	-

† For irbesartan vs placebo (the significance level for the primary endpoint was 0.025)

*Hazard ratios were adjusted for baseline level of microalbuminuria and blood pressure achieved during the study

Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

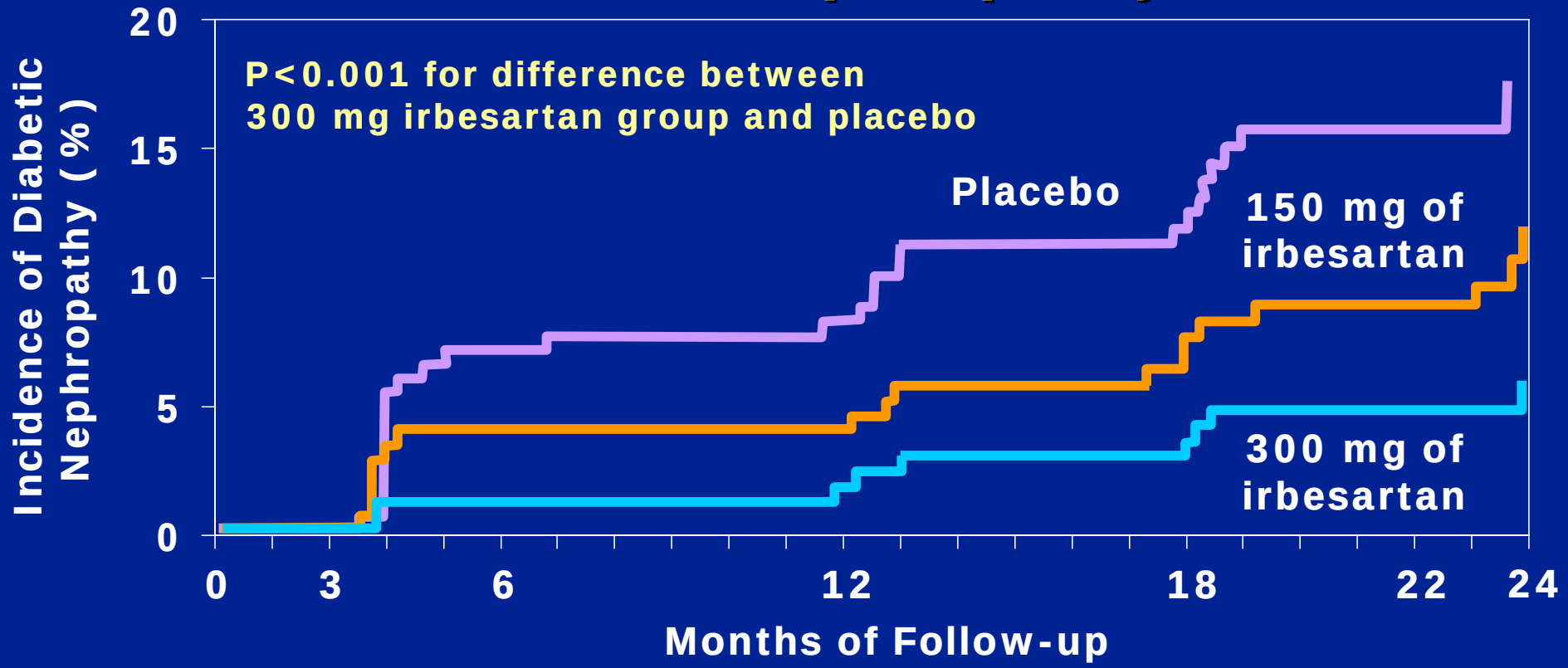
IRMA II Change in Urinary Albumin Excretion*



*P<0.001 for difference between both irbesartan groups and placebo

Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

IRMA II Incidence of Progression to Diabetic Nephropathy



Placebo (n)	201	201	164	154	139	129	36
Irbesartan 150 mg (n)	195	195	167	161	148	142	45
Irbesartan 300 mg	194	194	180	172	159	150	49

Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

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www.hypertensiononline.org

IRMA II Irbesartan vs Placebo Secondary Endpoints

- During the first 3 months, the decline in creatinine clearance (mL/min/m^2 body surface area per month) was greater than the decline between 3 and 24 months*
  - 0.9 vs 0.1 for the placebo group
  - 1.0 vs 0.2 for the 150 mg group
  - 1.9 vs 0.2 for the 300 mg group
- Irbesartan reduced the level of urine albumin excretion…
  - 24% in the 150 mg group (P=NS)†
  - 38% in the 300 mg group (P<0.001)†

***Neither the initial nor long-term decline differed significantly among the 3 groups**

† Compared to placebo

Parving HH, et al. N Engl J Med. 2001;345(12):870-878.

IRMA II
Summary of Important Findings

- Irbesartan significantly reduces the rate of progression from microalbuminuria to diabetic nephropathy
- Renoprotection from irbesartan in patients with type 2 diabetes and microalbuminuria is independent of its blood pressure lowering effect
- Antihypertensive treatment has a renoprotective effect in hypertensive patients with type 2 diabetes and microalbuminuria

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HYPERTENSION

The Science Base for Disease Prevention

Reduction of Endpoints in NIDDM With the Angiotensin II Antagonist Losartin Study (RENAAL) *powerpoint*

Overview:

Randomized multi-site, double-blind, placebo-controlled study to evaluate the renal protective effects of the angiotensin II receptor antagonist losartan in patients with type 2 diabetes and nephropathy

Summary of Important Findings:

In patients with type 2 diabetes:

- Losartan, in combination with other antihypertensive therapy (non-ACE or ARB), delayed the onset of the primary composite endpoint* (P=0.02) and delayed progression to end stage renal disease (P=0.002)
- Losartan reduced proteinuria (P=0.001) and the rate of decline in renal function (P=.01)
- Losartan reduced the incidence of the first hospitalization for heart failure (P=0.005)
- These benefits were above and beyond those attributable to blood pressure reduction alone.

***Composite of a doubling of serum creatinine, end stage renal disease, or death**

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Landmark Trials in Diabetics and Non-Diabetics with ESRD/Death as an Endpoint

Trial	Year	Endpoint significance	Achieved BP
Captopril	1993	P=0.007	**141/82**
AIPRI	1996	P<0.001	**139/82**
REIN	1997	P=0.03	**142/84**
RENAAL	2001	P=0.01	**142/77**
IDNT	2001	results pending	results pending

Lewis EJ, et al. N Engl J Med. 1993;329(20):1456-1462.
Maschio G, et al. N Engl J Med. 1996;334(15):939-945.
The GISEN Group. Lancet. 1997;349:1857–1863.

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Benefit of Angiotensin Receptor Blockers in Diabetes: Important Findings of 3 Major Clinical Trials

- **RENAAL (2001)**
  - **The angiotensin receptor blocker losartan compared to placebo reduced the risk of diabetic nephropathy developing to renal failure**
- IRMA II (2001)
  - Higher doses of the angiotensin receptor blocker irbesartan reduced the risk of progression of renal insufficiency
- IDNT (2001)
  - The angiotensin receptor blocker irbesartan compared to the calcium channel blocker amlodipine provided better renal protection in hypertensive type 2 diabetics, reducing the chance of diabetic nephropathy developing to renal failure

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www.hypertensiononline.org

The Reduction of Endpoints in NIDDM With the Angiotensin II Antagonist Losartan Study

RENAAL Overview

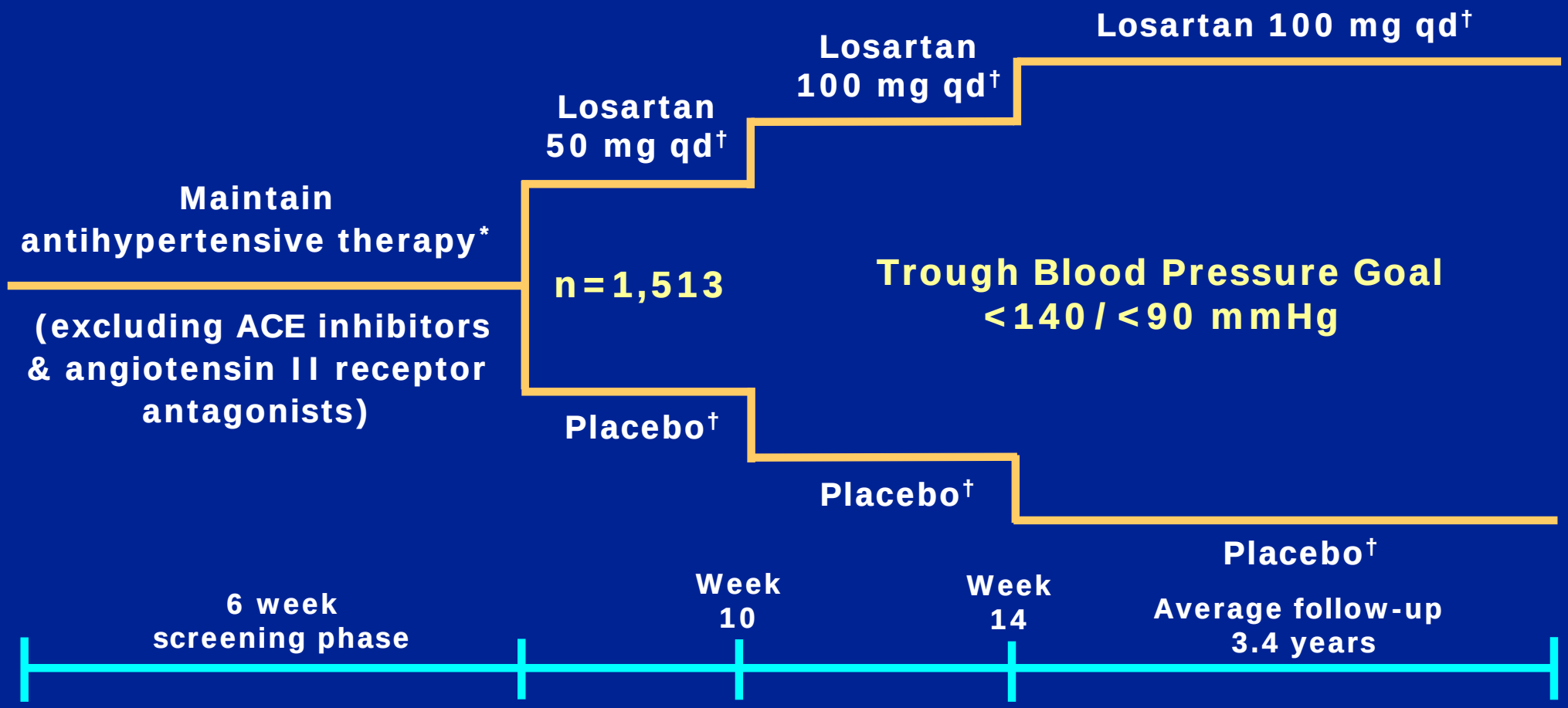
- Randomized multi-site, double-blind, placebo-controlled study to evaluate the renal protective effects of the angiotensin II receptor antagonist losartan in patients with type 2 diabetes and nephropathy

Population

- 1,513 patients (31 to 70 years old)
  - Diagnosed type 2 diabetes and nephropathy
    - albumin/creatinine ratio ≥300 mg/g
    - serum creatinine between 1.3–3.0 mg/dL (1.5–3.0 mg/dL for men >60 kg)

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

RENAAL Study Design



*Open-label diuretic, calcium channel blocker, beta-blocker, alpha-blocker, or centrally acting agent

†In combination with open-label diuretic, calcium channel blocker, beta-blocker, alpha-blocker, and/or centrally acting agent

Brenner BM, et al. J Renin Angiotens Aldo System. 2000;1:329–335.

RENAAL Endpoints

Primary Endpoint

- Composite of a doubling of serum creatinine, end stage renal disease, or death

Secondary Endpoints

1. Composite of morbidity & mortality from cardiovascular causes
    - Myocardial infarction
    - Stroke
    - First hospitalization for heart failure or unstable angina, coronary or peripheral revascularization
    - Death from cardiovascular causes
2. Proteinuria
3. Rate of progression of renal disease

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

RENAAL Baseline Characteristics*

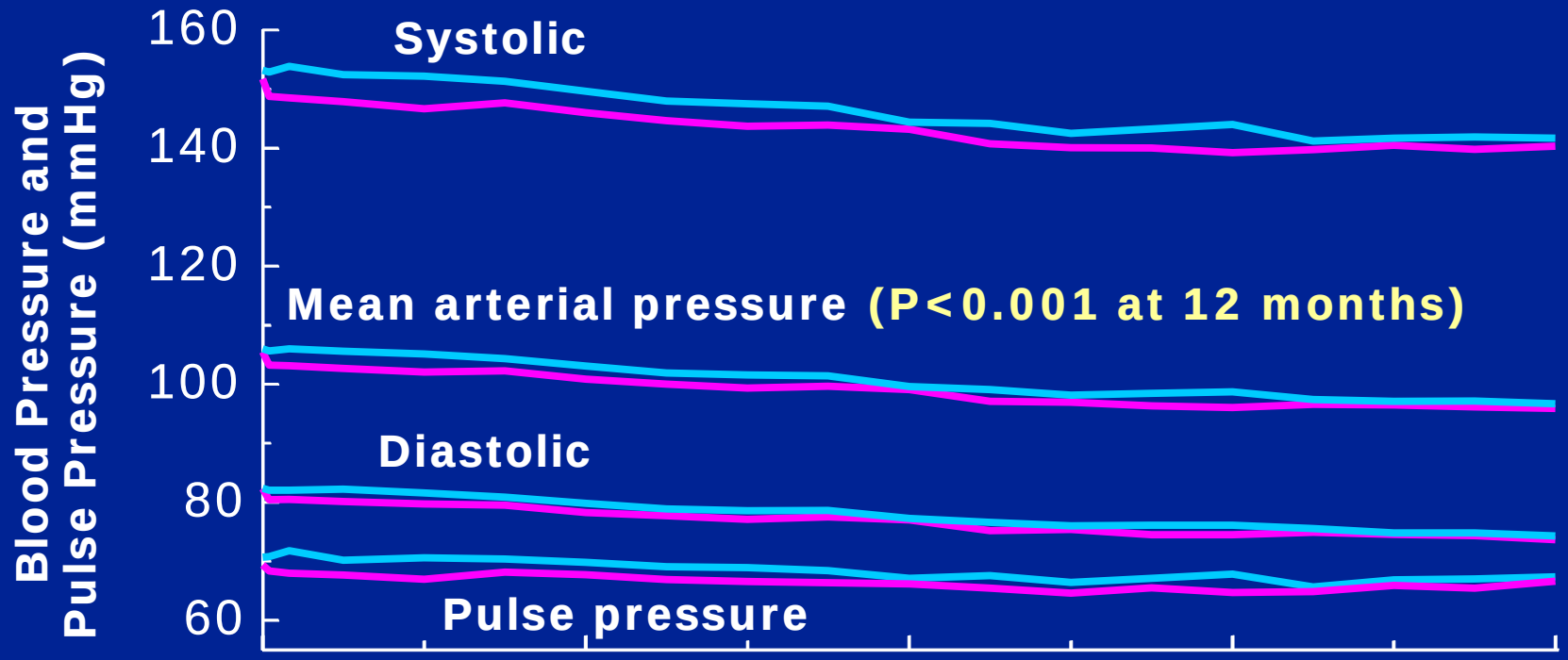
	Losartan† Group n=751	Placebo† Group n=762
Mean Age (yrs)	60	60
Male (%)	62	65
Mean Systolic BP (mmHg) Mean Diastolic BP (mmHg)	152 82	153 82
Mean BMI (kg/m²)	30	29
Median urinary albumin:creatinine ratio (mg/g)	1237	1261
Mean serum creatinine (mg/dL)	1.9	1.9
Mean glycosylated hemoglobin (%)	8.5	8.4

*The differences between the treatment groups were not statistically significant

†In combination with open-label diuretic, calcium channel blocker, beta-blocker, alpha-blocker, and/or centrally acting agent

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

RENAAL Trends in Blood Pressure and Pulse Pressure



Placebo* (n)	762	658	532	313	71
Losartan* (n)	751	673	562	371	101

*In combination with open-label diuretic, calcium channel blocker, beta-blocker, alpha-blocker, and/or centrally acting agent

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

RENAAL Impact of Losartan on Primary Composite Endpoint*

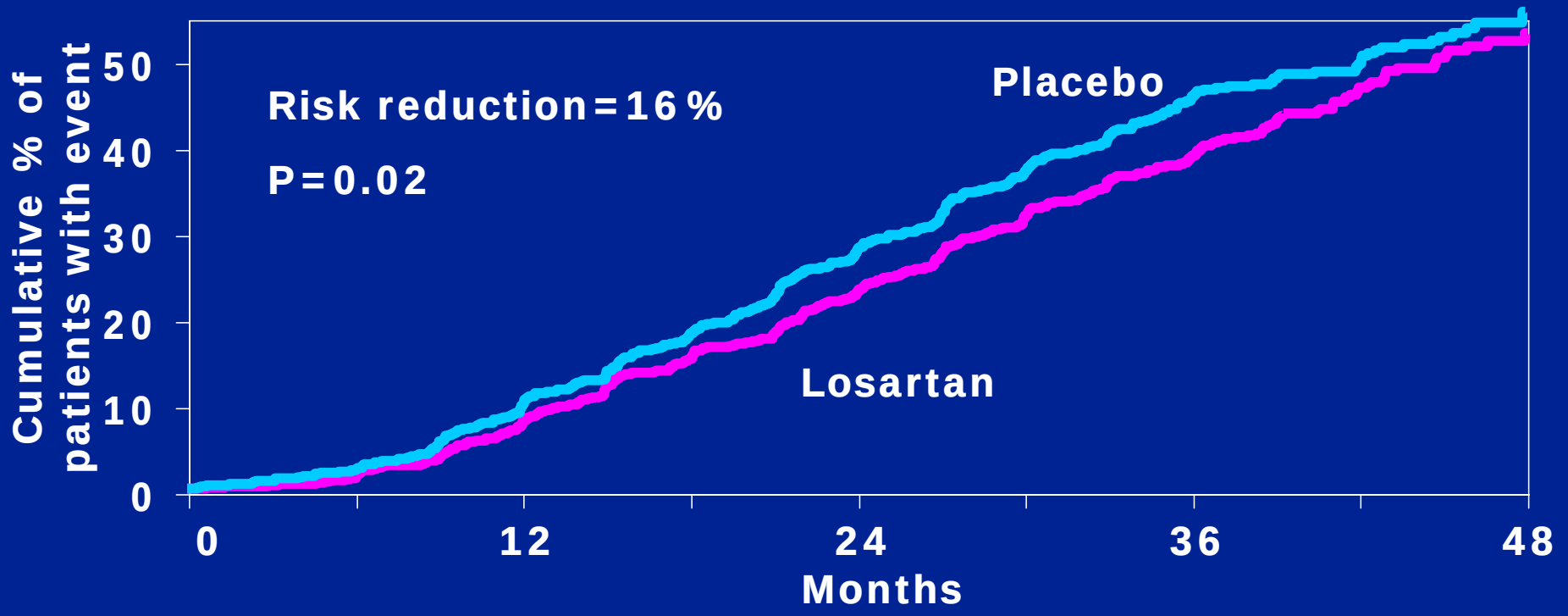
	Losartan† Group n=751		Placebo† Group n=762		P value	% Relative risk reduction (95% CI)
	n	%	n	%		
Primary composite endpoint*	327	43.5	359	47.1	0.02	16 (2 to 28)
· Doubling of serum creatinine	162	21.6	198	26.0	0.006	25 (8 to 39)
· ESRD	147	19.6	194	25.5	0.002	28 (11 to 42)
· Death	158	21.0	155	20.3	0.88	-2 (-27 to 19)
· ESRD or Death	255	34.0	300	39.4	0.01	20 (5 to 32)
· Doubling of serum creatinine and ESRD	226	30.1	263	34.5	0.01	21 (5 to 34)

*Composite of a doubling of serum creatinine, end stage renal disease (ESRD), or death

†In combination with open-label diuretic, calcium channel blocker, beta-blocker, alpha-blocker, and/or centrally acting agent

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

RENAAL Patients Reaching the Primary Composite Endpoint*



Placebo† (n)	762	689	554	295	36
Losartan† (n)	751	692	583	329	52

†In combination with open-label diuretic, calcium channel blocker, beta-blocker, alpha-blocker, and/or centrally acting agent

*doubling of serum creatinine, end stage renal disease, death

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

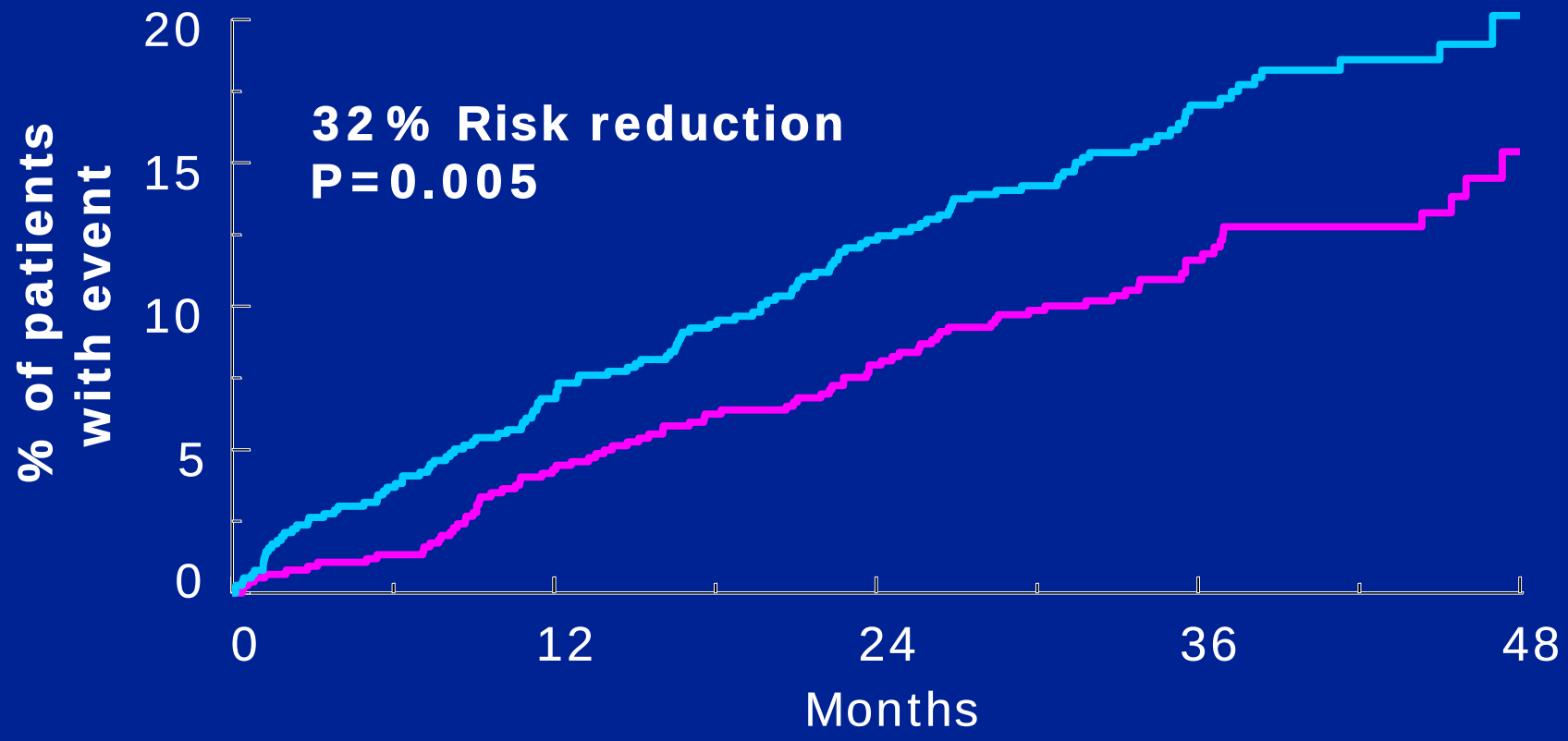
RENAAL Impact of Losartan on Secondary Endpoints

- 10% risk reduction in the secondary composite endpoint* (P=0.26)
  - 32% risk reduction in first hospitalization for heart failure (P=0.005)
- 35% average reduction in the level of proteinuria (P<0.001 for the overall treatment effect)
- 18% reduction in the decline of renal function (P=0.01)
  - 15.2% reduction in the estimated decline in the glomerular filtration rate (P=0.01)

***Composite of cardiovascular morbidity and mortality, including myocardial infarction, stroke, first hospitalization for heart failure or unstable angina, coronary or peripheral revascularization, or death from cardiovascular causes**

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

RENAAL First Hospitalization for Heart Failure



Placebo* (n)	762	685	616	375	53
Losartan* (n)	751	701	637	388	74

*In combination with open-label diuretic, calcium channel blocker, beta-blocker, alpha-blocker, and/or centrally acting agent

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

RENAAL
Summary of Important Findings

In patients with type 2 diabetes and nephropathy:

- Losartan, in combination with other antihypertensive therapy (non-ACE or ARB), delayed the onset of the primary composite endpoint* (P=0.02) and delayed progression to end stage renal disease (P=0.002)
- Losartan reduced proteinuria (P<0.001) and the rate of decline in renal function (P=0.01)
- Losartan reduced the incidence of first hospitalization for heart failure (P=0.005)
- These benefits were above and beyond those attributable to blood pressure reduction alone

***Composite of a doubling of serum creatinine, end stage renal disease, or death**

Brenner BM, et al. N Engl J Med. 2001;345(12):861-869.

Benefit of Angiotensin Receptor Blockers in Diabetes: Important Findings of 3 Major Clinical Trials

- RENAAL (2001)
  - The angiotensin receptor blocker losartan compared to placebo reduced the risk of diabetic nephropathy developing to renal failure
- **IRMA II (2001)**
  - **Higher doses of the angiotensin receptor blocker irbesartan reduced the risk of progression of renal insufficiency**
- IDNT (2001)
  - The angiotensin receptor blocker irbesartan compared to the calcium channel blocker amlodipine provided better renal protection in hypertensive type 2 diabetics, reducing the chance of diabetic nephropathy developing to renal failure

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HYPERTENSION

The Science Base for Disease Prevention

The Irbesartin in Diabetes Nephropathy Trial (IDNT) *powerpoint*

Overview:

Randomized, double-blind trial to determine if irbesartan, an angiotensin II receptor blocker, and amlodipine, a calcium channel blocker, slow the progression of nephropathy in type 2 diabetes.

Summary of Important Findings:

In hypertensive, type 2 diabetes with nephropathy:

- Irbesartan reduced the incidence of the primary composite endpoint of a doubling of serum creatinine, end stage renal disease, or death by 23% vs amlodipine (P=0.006) and 20% vs placebo (P=0.02)
- Proteinuria was reduced 33% in the irbesartan group compared to 10% with placebo
- These benefits were above and beyond those attributable to blood pressure reduction alone

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The Irbesartan in Diabetic Nephropathy Trial

IDNT overview

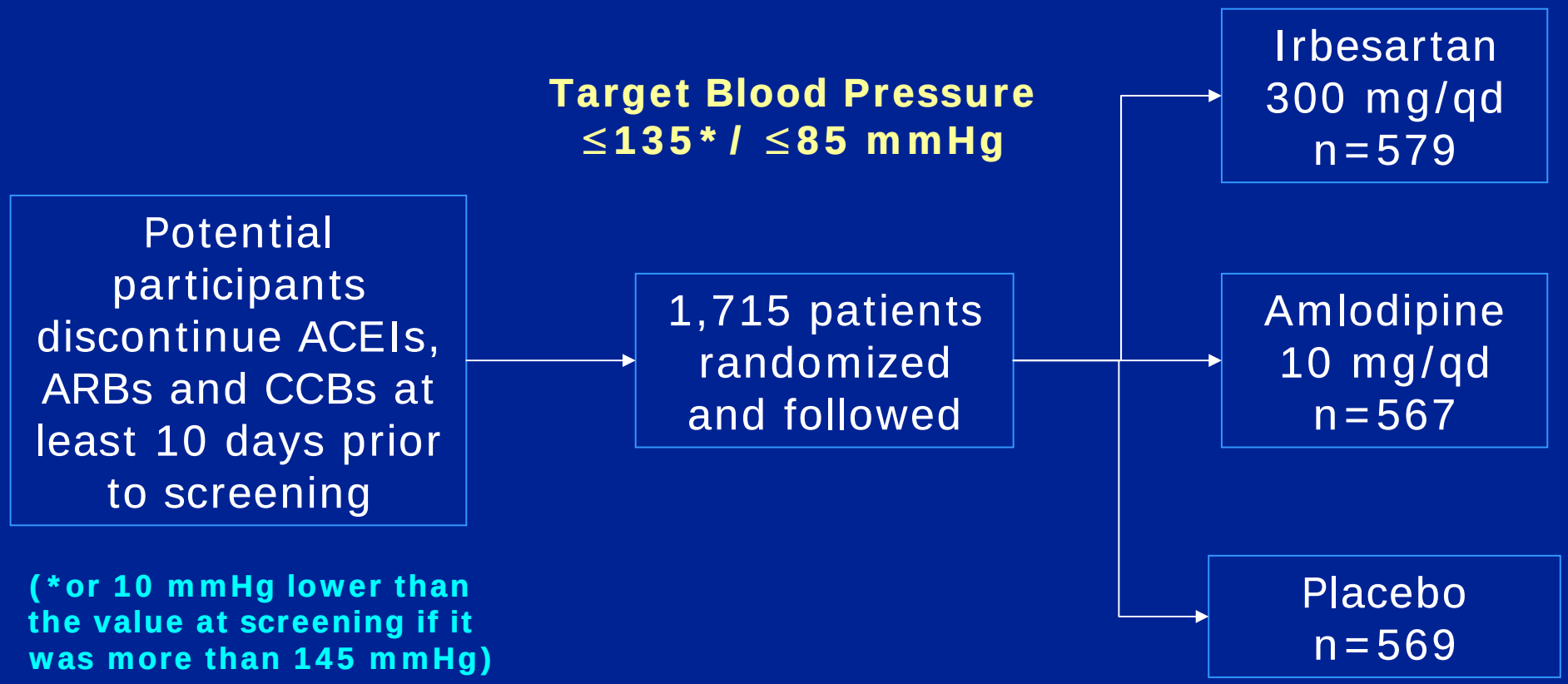
- Randomized, double-blind trial to determine if irbesartan, an angiotensin II receptor blocker, and amlodipine, a calcium channel blocker, slow the progression of nephropathy in type 2 diabetics

Population

- 1,715 patients (30 to 70 years old)
  - Diagnosed type 2 diabetes
  - Hypertension (systolic BP>135, diastolic BP >85 mmHg or treatment w/ antihypertensive agents)
  - Nephropathy (urinary protein excretion of at least 900 mg/24hrs and serum creatinine between 1.0–3.0 mg/dL in women, and 1.2–3.0 mg/dL in men)

Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

IDNT Study Design



Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

IDNT Endpoints

Primary Endpoint

- Composite of a doubling of serum creatinine, end stage renal disease (as indicated by starting dialysis, serum creatinine $\geq$ 6 mg/dl, or transplantation), or death

Secondary Cardiovascular Endpoint

- Composite of death from cardiovascular causes, nonfatal myocardial infarction, heart failure resulting in hospitalization, a permanent neurologic deficit caused by a cerebrovascular event, or lower limb amputation above the ankle

Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

IDNT Baseline Characteristics*

	Irbesartan Group n=579	Amlodipine Group n=567	Placebo Group n=569
Mean age (yrs)	59.3	59.1	58.3
Male (%)	65	63	71
Mean Systolic BP (mmHg) Mean Diastolic BP (mmHg)	160 87	159 87	158 87
Mean BMI (kg/m^2)	31.0	30.9	30.5
Median urinary albumin excretion (g/24hr)	1.9	1.9	1.9
Mean serum creatinine (mg/dl)	1.67	1.65	1.69
Mean glycosylated hemoglobin (%)	8.1	8.2	8.2

*The differences between the treatment groups were not statistically significant, except for the smaller number of females in the placebo group (P=0.02)

Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

IDNT Irbesartan vs Amlodipine Primary and Secondary Endpoints

	Irbesartan Group n=579		Amlodipine Group n=567		P value	Unadjusted relative risk (95% CI)
	n	%	n	%		
Primary composite endpoint*	189	32.6	233	41.1	0.006	0.77 (0.63-0.97)
• Doubling of serum creatinine	98	16.9	144	25.4	<0.001	0.63 (0.48-0.81)
• End stage renal disease	82	14.2	104	18.3	0.07	0.77 (0.57-1.03)
• Death	87	15.0	83	14.6	0.80	1.04 (0.77-1.40)
Secondary composite endpoint‡	138	23.8	128	22.6	0.79	1.03 (0.81-1.31)

*Composite of a doubling of serum creatinine, end stage renal disease, or death

‡Composite of death from cardiovascular causes, nonfatal myocardial infarction, heart failure resulting in hospitalization, a permanent neurologic deficit caused by a cerebrovascular event, or lower limb amputation above the ankle

Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

IDNT Irbesartan vs Placebo Primary and Secondary Endpoints

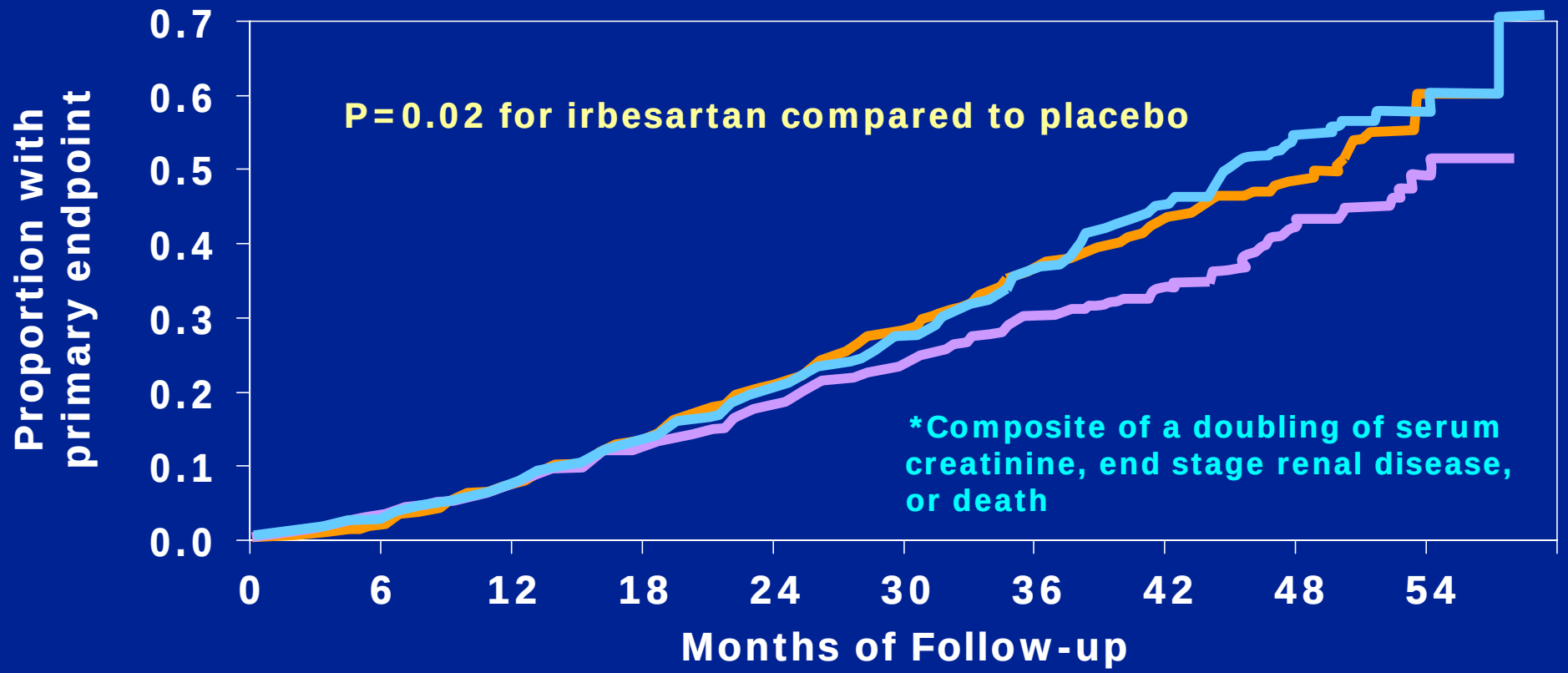
	Irbesartan Group n=579		Placebo Group n=569		P value	Unadjusted relative risk (95% CI)
	n	%	n	%		
Primary composite endpoint*	189	32.6	222	39.0	0.020	0.80 (0.66-0.97)
• Doubling of serum creatinine	98	16.9	135	23.7	0.003	0.67 (0.52-0.87)
• End stage renal disease	82	14.2	101	17.8	0.070	0.77 (0.57-1.03)
• Death	87	15.0	93	16.3	0.570	0.92 (0.69-1.23)
Secondary composite endpoint‡	138	23.8	144	25.3	0.400	0.91 (0.72-1.14)

*Composite of a doubling of serum creatinine, end stage renal disease, or death

‡Composite of death from cardiovascular causes, nonfatal myocardial infarction, heart failure resulting in hospitalization, a permanent neurologic deficit caused by a cerebrovascular event, or lower limb amputation above the ankle

Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

IDNT Proportion of Patients with the Primary Composite Endpoint*



Irbesartan (n)	579	555	528	496	400	304	216	146	65
Amlodipine (n)	565	542	508	474	385	287	187	128	46
Placebo (n)	568	551	512	471	401	280	190	122	53

Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

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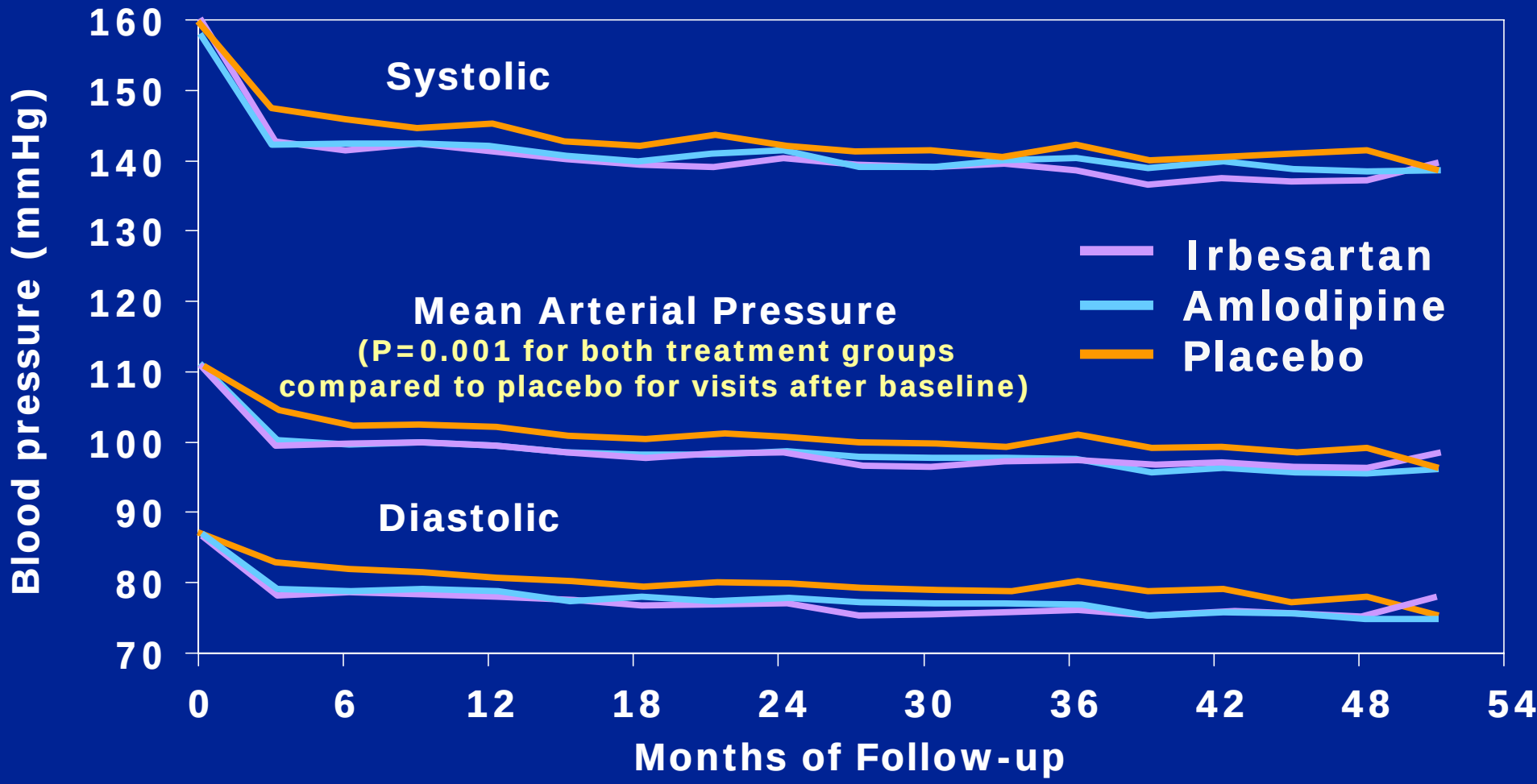
IDNT Average Systolic, Mean Arterial and Diastolic Blood Pressures



Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

www.hypertensiononline.org

IDNT
Summary of Important Findings

In hypertensive, type 2 diabetics with nephropathy:

- Irbesartan reduced the incidence of the primary composite endpoint of a doubling of serum creatinine, end stage renal disease, or death by 23% vs amlodipine (P=0.006) and 20% vs placebo (P=0.02)
- Proteinuria was reduced 33% in the irbesartan group compared to 10% with placebo
- These benefits were above and beyond those attributable to blood pressure reduction alone

Lewis EJ, et al. N Engl J Med. 2001;345(12):851-860.

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HYPERTENSION

The Science Base for Disease Prevention

The Hypertension Detection and Follow-up Program (HDFP) *powerpoint*

Conclusions:

- Overall stepped care (SC) compared to referred care (RC) reduced total mortality by 17% (6.4 vs. 7.7%; P < 0.01).
- In patients with baseline diastolic blood pressure 90 – 104 mm Hg (n=7800), mortality was reduced by 20% with SC vs. RC (5.9% vs. 7.4%; P < 0.01).
- Aggressive treatment of SC patients with the lowest baseline diastolic blood pressures (90 - 94 and 95 – 99 mm Hg) reduced mortality.

Five-year findings of the hypertension detection and follow-up program. I. Reduction in mortality of persons with high blood pressure, including mild hypertension. Hypertension Detection and Follow-up Program Cooperative Group.

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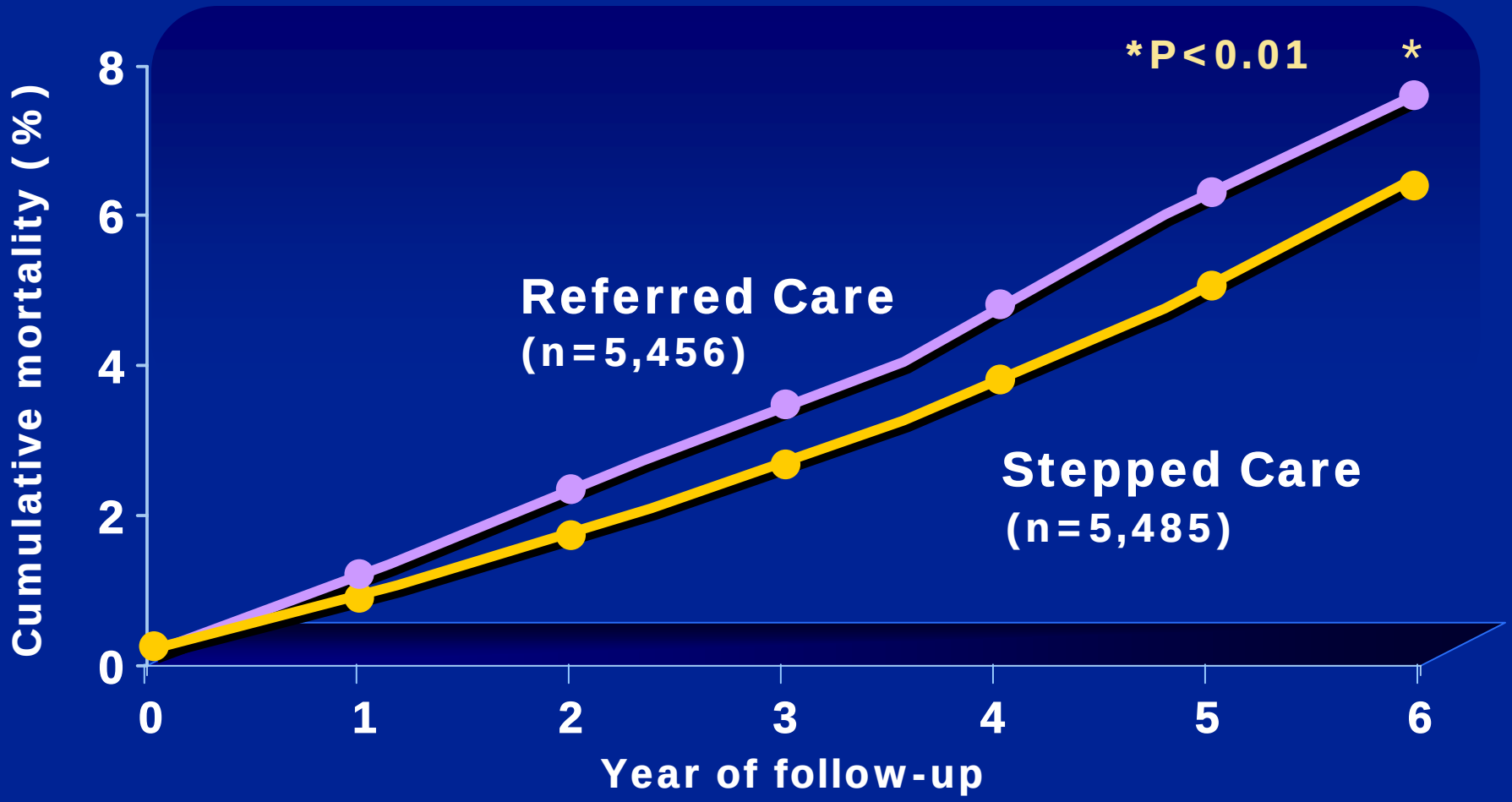
The Hypertension Detection and Follow-up Program, 1979

The Hypertension Detection and Follow-up Program, 1979

Cohort	10,940; 54% men; 44% black
Age	30–69 yrs old; mean 50.8 yrs old
Eligibility	Diastolic BP ≥ 90 mmHg
Design	Stepped Care vs Referred Care
Therapy	Chlorthalidone (reserpine, methyldopa)
Duration	5 years
BP change	5 mmHg (Stepped Care vs Referred Care)

HDFP Cooperative Group. JAMA. 1979;242:2562-2571.

HDFP Mortality Rates
Entire Cohort

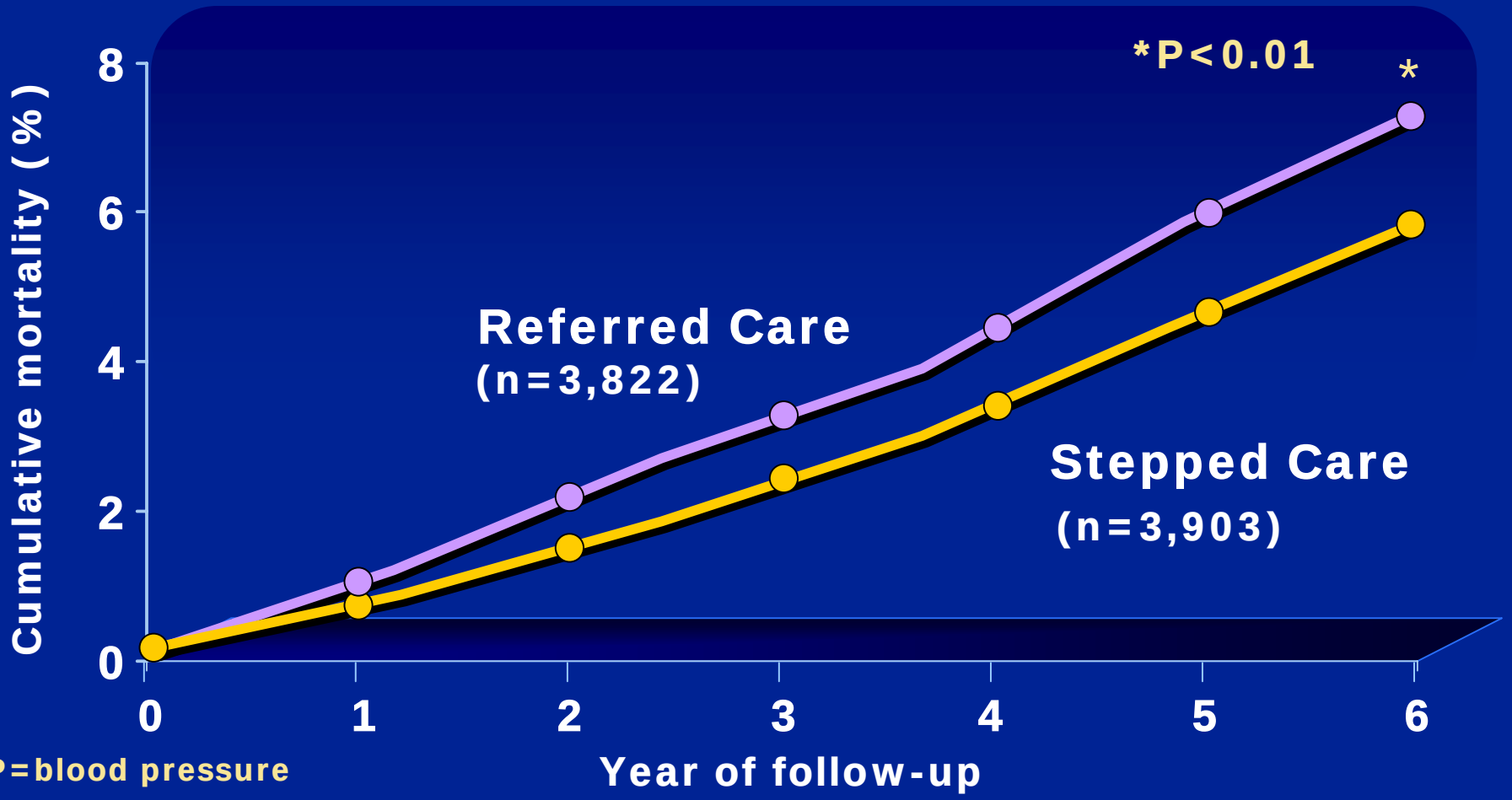


HDFP=Hypertension Detection and Follow-up Program

HDFP Cooperative Group. JAMA. 1979;242:2562-2571.

HDFP Mortality Rates

Diastolic BP 90–104 mmHg



BP=blood pressure

HDFP=Hypertension Detection and Follow-up Program

HDFP Cooperative Group. JAMA. 1979;242:2562-2571.

HDFP Conclusions

- Overall, stepped care (SC) compared to referred care (RC) reduced total mortality by 17% (6.4 vs. 7.7%; P<0.01)
- In patients with baseline diastolic blood pressure 90–104 mmHg (n=7,725), mortality was reduced by 20% with SC vs. RC (5.9% vs. 7.4%; P<0.01)
- Aggressive treatment of SC patients with the lowest baseline diastolic blood pressures (90–94 and 95–99 mmHg) reduced mortality

HDFP=Hypertension Detection and Follow-up Program

HDFP Cooperative Group. JAMA. 1979;242:2562-2571.

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HYPERTENSION

The Science Base for Disease Prevention

The African American Study of Kidney Disease and Hypertension (AASK) *powerpoint*

Overview:

The AASK Study enrolled 1,094 African American patients with renal disease at 21 US centers, and randomized them to receive one of the 3 study drugs:

-Ramipril – ACEI or

-Amoldipine – CCB or

-Metoptrolol – Beta-blocker

Results:

After adjustments for covariates, the risk of reduction for ramipiril vs. amlodipine groups in the clinical composite outcomes (GFR, dialysis, or death) was 38% (p=0.005)

Effect of blood pressure lowering and antihypertensive drug class on progression of hypertensive kidney disease: results from the AASK trial.

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AASK: The African American Study of Kidney Disease and Hypertension

- The AASK trial enrolled 1,094 African American patients with renal disease at 21 US centers, and randomized them to receive one of 3 study drugs:
  - Ramipril – ACEI or
  - Amlodipine – CCB or
  - Metoprolol – Beta-blocker
- Results
  - After adjustments for covariates, the risk reduction for ramipril vs amlodipine groups in the clinical composite outcomes (GFR, dialysis, or death) was 38% (p=0.005)

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HYPERTENSION

The Science Base for Disease Prevention

The Heart Outcomes Prevention Evaluation Study (HOPE) *powerpoint*

Overview:

A multi-center, randomized trial enrolling 9,297 patients ≥ 55 years old with a history of cardiovascular disease, or diabetes, or diabetes plus at least one other cardiovascular risk factor. Patients were treated with ramipril or placebo and vitamin E or placebo for an average of 4.5 years. Combined primary endpoint was the development of myocardial infarction, stroke, or cardiovascular death. Secondary endpoints were total mortality, admission to hospital for congestive heart failure or unstable angina, complications related to diabetes, and cardiovascular revascularization.

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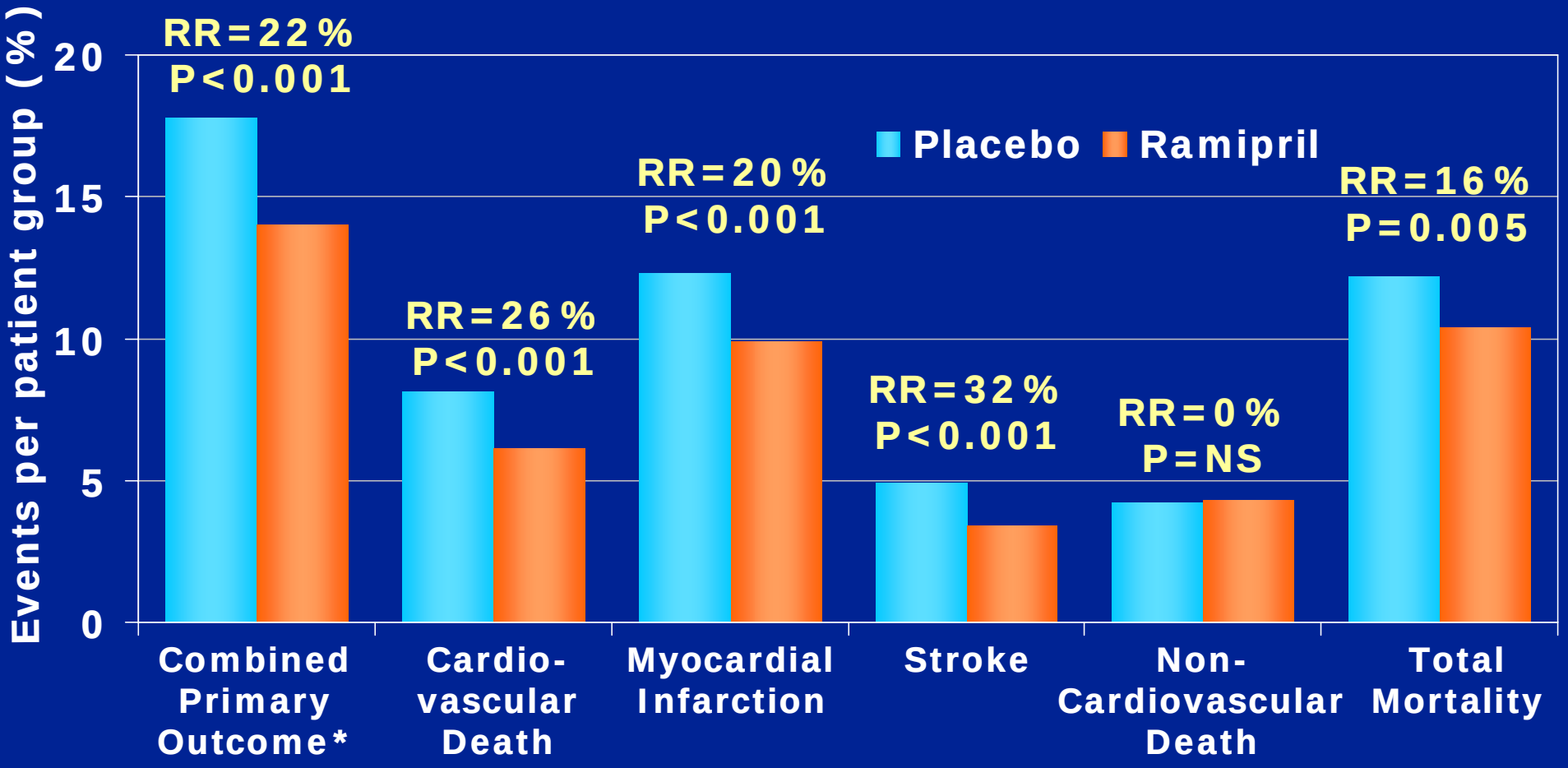
HOPE Study

- The **H**eart **O**utcomes **P**revention **E**valuation (HOPE) Study was a multicenter, randomized trial enrolling 9,297 patients ≥55 years old with a history of cardiovascular disease, or diabetes plus at least one other cardiovascular risk factor
- Patients were treated with ramipril or placebo and vitamin E or placebo for an average of 4.5 years
- Combined primary endpoint was the development of myocardial infarction, stroke, or cardiovascular death
- Secondary endpoints were total mortality, admission to hospital for congestive heart failure or unstable angina, complications related to diabetes, and cardiovascular revascularization

Yusuf S, et al. N Engl J Med. 2000;342:145-153.

HOPE Study Outcomes: Events Per Patient Group



*The occurrence of myocardial infarction, stroke or cardiovascular death

RR=Relative risk reduction

Yusuf S, et al. N Engl J Med. 2000;342:145-153.

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HYPERTENSION

The Science Base for Disease Prevention

The Hypertension Optimal Treatment Study (HOT)

powerpoint

Overview:

To assess the association between major cardiovascular events (non-fatal myocardial infarction, non-fatal stroke, and cardiovascular death) and the target BP's of ≤ 90 mm Hg, ≤ 85 mm Hg, and ≤ 80 mm Hg; the association between major cardiovascular events and diastolic BP achieved during treatment; and the impact of the addition of acetylsalicylic acid to antihypertensive treatment on the rate of major cardiovascular events.

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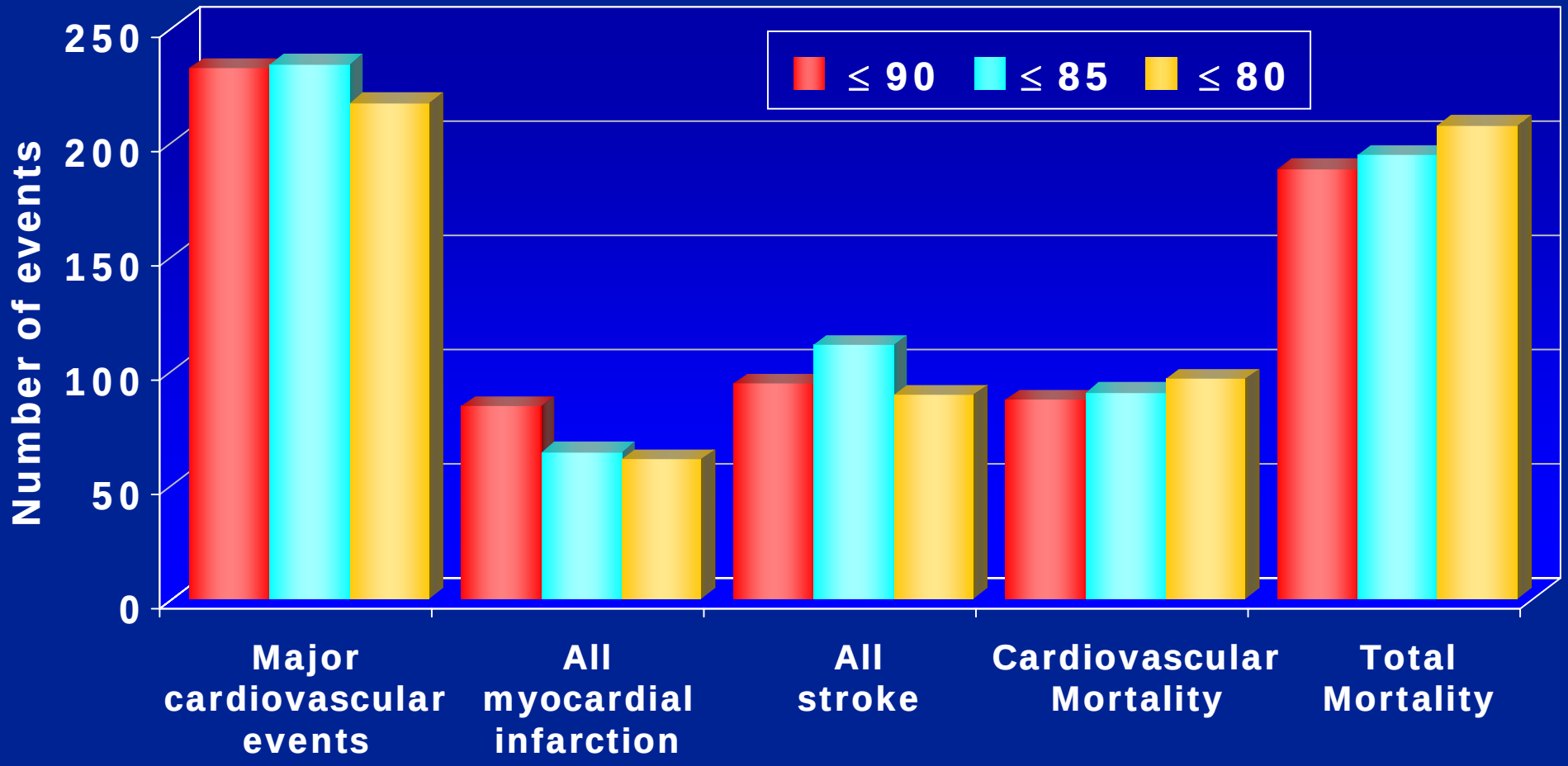
HOT Study

- The **H**ypertension **O**ptimal **T**reatment (HOT) Study enrolled 18,790 patients to assess the optimal target diastolic blood pressure for hypertensive patients over a period of 4.9 years (average follow-up 3.8 years)
- Patients were randomized to felodipine + placebo or felodipine + aspirin
- Principal aims of this study were to assess: the association between major cardiovascular events (non-fatal myocardial infarction, non-fatal stroke, and cardiovascular death) and the target BPs of ≤90 mmHg, ≤85 mmHg, and ≤80 mmHg; the association between major cardiovascular events and diastolic BP achieved during treatment; and the impact of the addition of acetylsalicylic acid to antihypertensive treatment on the rate of major cardiovascular events
- 1,501 patients had diabetes at baseline

Hansson L, et al. Lancet. 1998;351:1755–1762.

HOT Outcomes by Target Blood Pressure Group*



*The outcomes for different blood pressure groups were not statistically significant

Hansson L, et al. Lancet. 1998;351:1755–1762.

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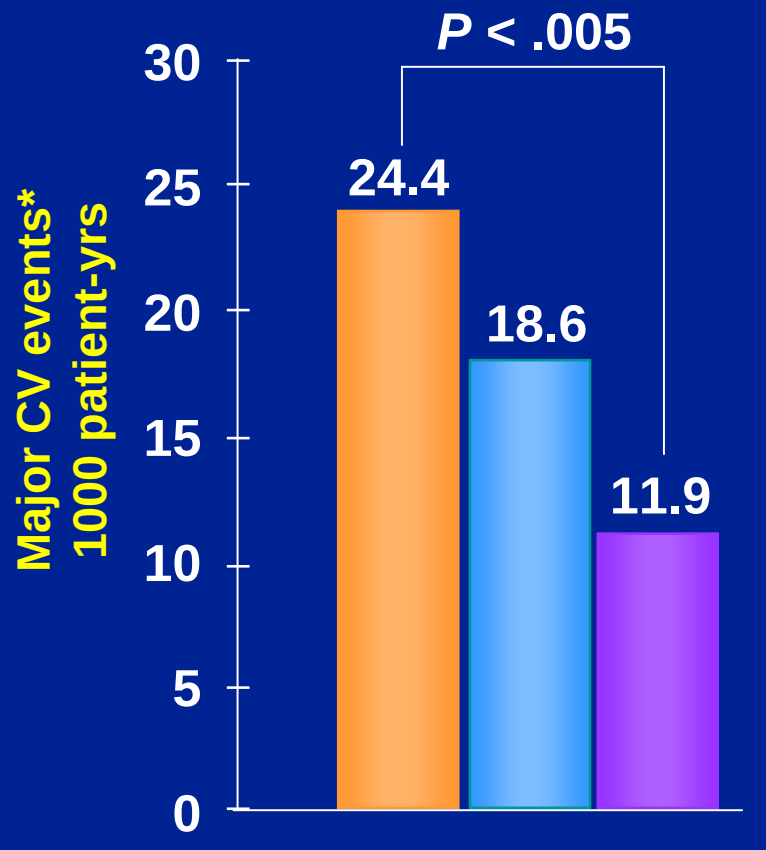
HOT Trial: BP Control Reduces Cardiovascular Events in Diabetics

Diabetes Subgroup

Target Diastolic BP (mmHg)	Number of Patients	Achieved† Systolic BP (mmHg)	Achieved† Diastolic BP (mmHg)
≤ 90	501	143.7	85.2
≤ 85	501	141.4	83.2
≤ 80	499	139.7	81.1

† Achieved = Mean of all BPs from 6 months of follow-up to end of study



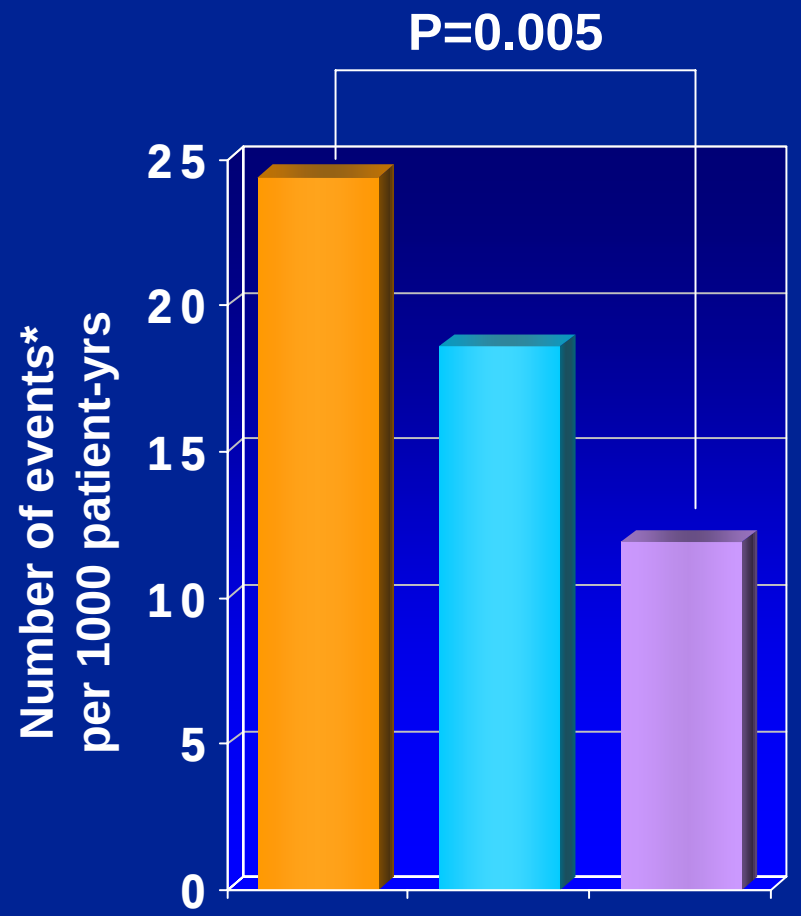
*includes all myocardial infarction, all strokes, and all other CV deaths

Hansson L, et al. Lancet. 1998;351:1755–1762.

HOT Diabetic Subgroup Reduction in Cardiovascular Events

Target diastolic BP (mmHg)	Achieved† systolic BP (mmHg)	Achieved† diastolic BP (mmHg)	# of patients with diabetes
≤ 90	143.7	85.2	501
≤ 85	141.4	83.2	501
≤ 80	139.7	81.1	499

†mean of all blood pressures for all study patients in BP subgroups from 6 months of follow-up to end of study



*Includes all myocardial infarction, all strokes, and all other cardiovascular deaths

Hansson L, et al. Lancet. 1998;351:1755–1762.

Impact of Blood Pressure Reduction on Mortality in Diabetes

Trial	Conventional care	Intensive care	Risk reduction	P-value
UKPDS	154/87	144/82	32%	0.019
HOT	144/85	140/81	66%	0.016

Mortality endpoints are:
UK Prospective Diabetes Study (UKPDS) – "diabetes related deaths"
Hypertension Optimal Treatment (HOT) Study – "cardiovascular deaths" in diabetics

Turner RC, et al. BMJ. 1998;317:703-713.
Hansson L, et al. Lancet. 1998;351:1755–1762.

Average Number of Anti-Hypertensive Agents Used to Achieve Target BP

	MDRD	ABCD	HOT	UKPDS
Goal BP	<92 mmHg MAP*	<75 mmHg DBP	<80 mmHg DBP	<85 mmHg DBP
Achieved BP	93	~75	81	82
Avg # of drugs per patient	3.6	2.7	3.3	2.8

*The goal mean arterial pressure (MAP) of <92 mmHg specified in the MDRD trial corresponds to a systolic/diastolic blood pressure of approximately 125/75 mmHg.

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HYPERTENSION

The Science Base for Disease Prevention

MRFIT

Risk Factors for Progression of Renal Disease *powerpoint*

- Randomized, primary prevention trial.
- Community comparison trial of stepped care therapy.

Brief description of the Multiple Risk Factor Intervention Trial.

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Risk Factors for Progression of Renal Disease

Can be modified	Cannot be modified
Hypertension	Age
Albuminuria/Proteinuria	Ethnicity
Dyslipidemia	Gender
Hemoglobin A_{1C}	
Smoking	
Anemia	
$Ca \cdot P0_4$	

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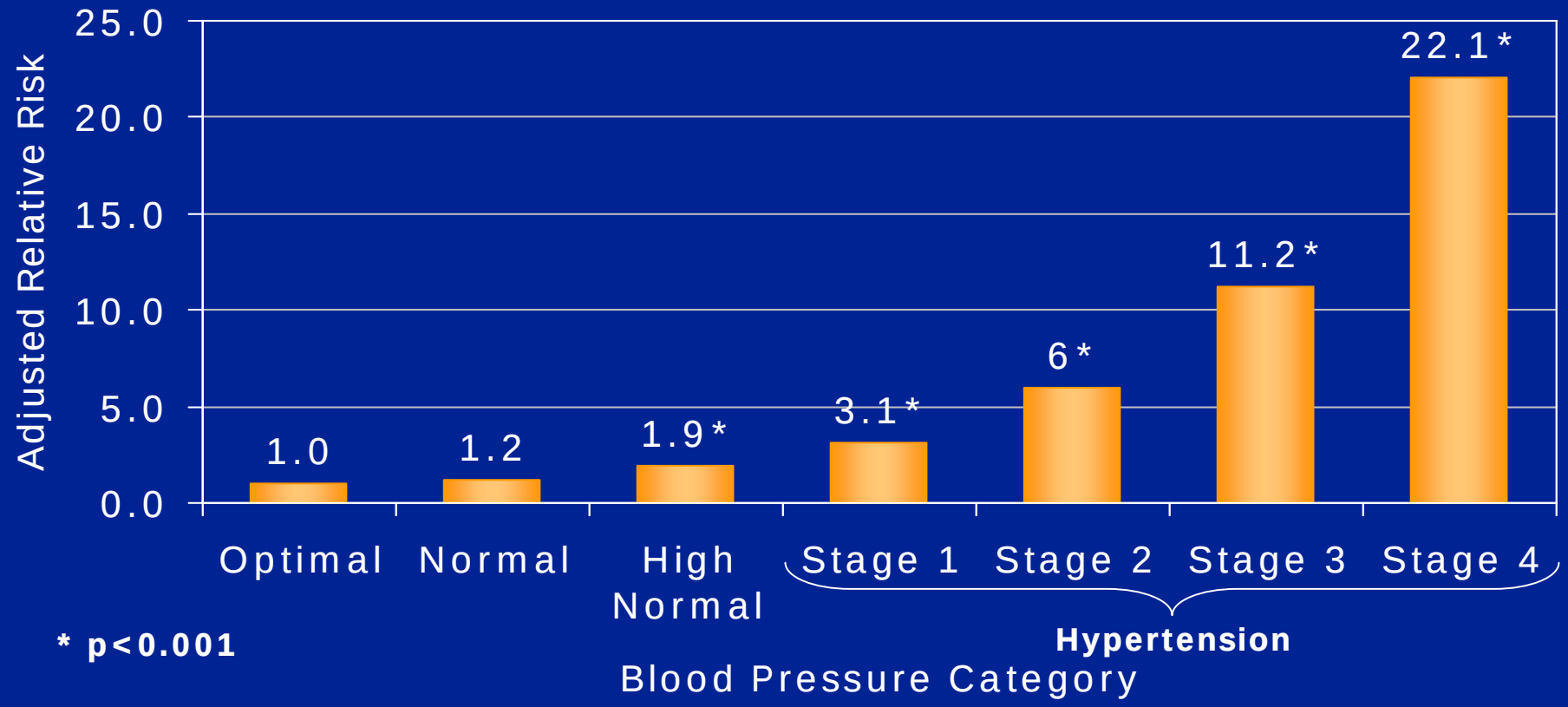
ESRD Due to Any Cause In 332,544 Men Screened for MRFIT

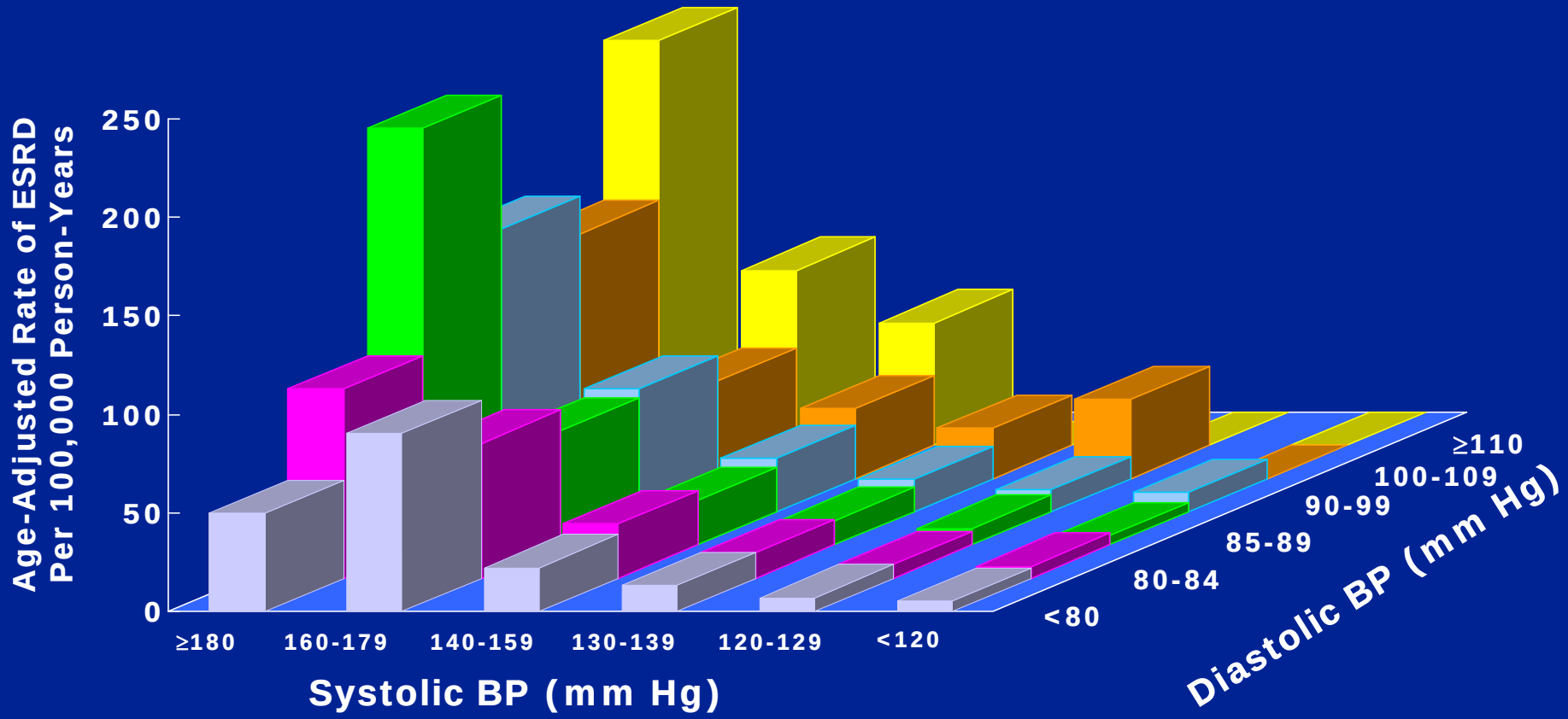
Adjusted Relative Risk§



§ Men with optimal blood pressure was the reference category.

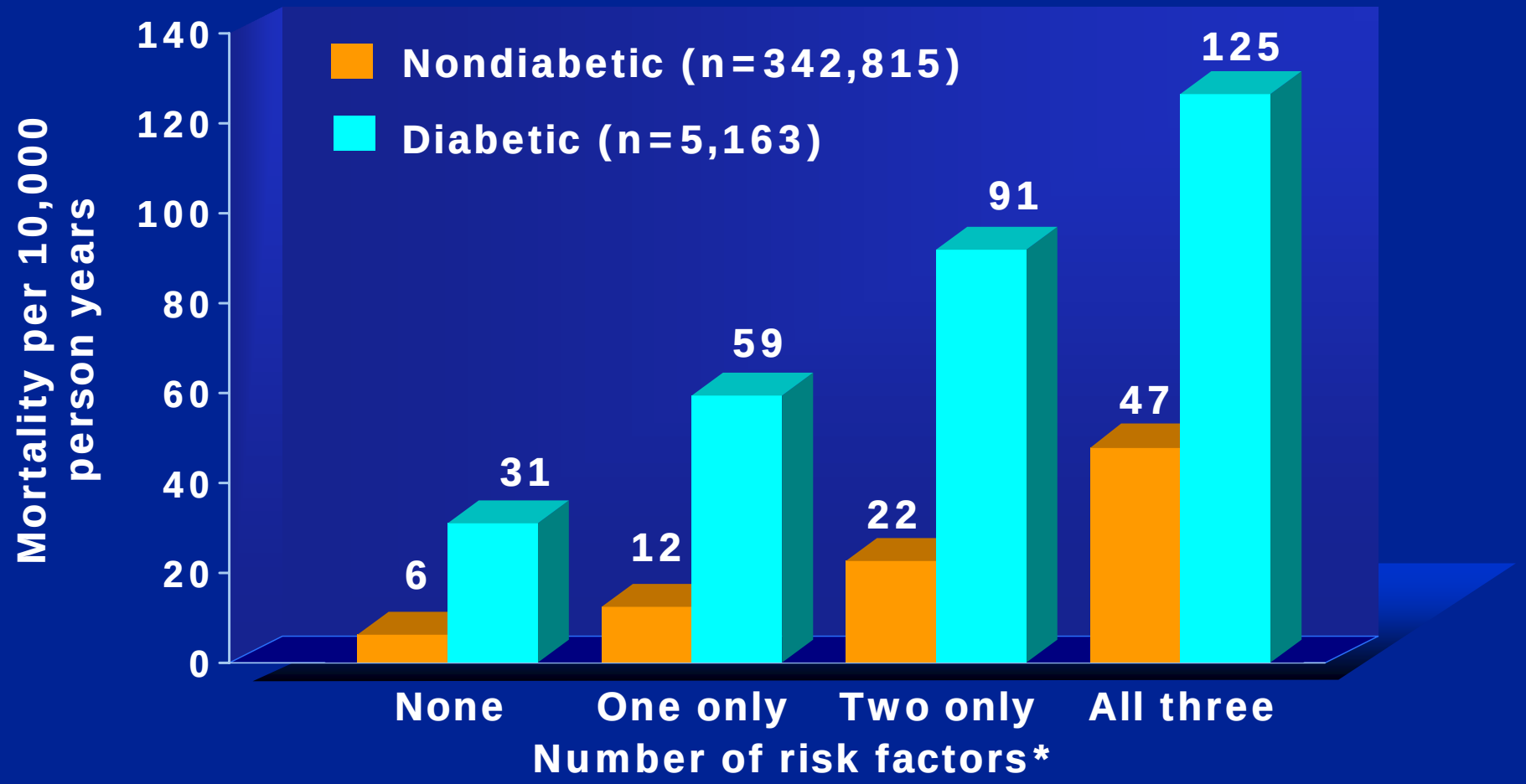
Klag MJ, et al. N Engl J Med. 1996;334(1):13-18.

HTN Linked To Chronic Renal Disease Among 332,544 Men Screened for MRFIT



Adapted from Klag MJ, et al. N Engl J Med. 1996;334(1):13-18.

Impact of Diabetes on Cardiovascular Mortality in MRFIT

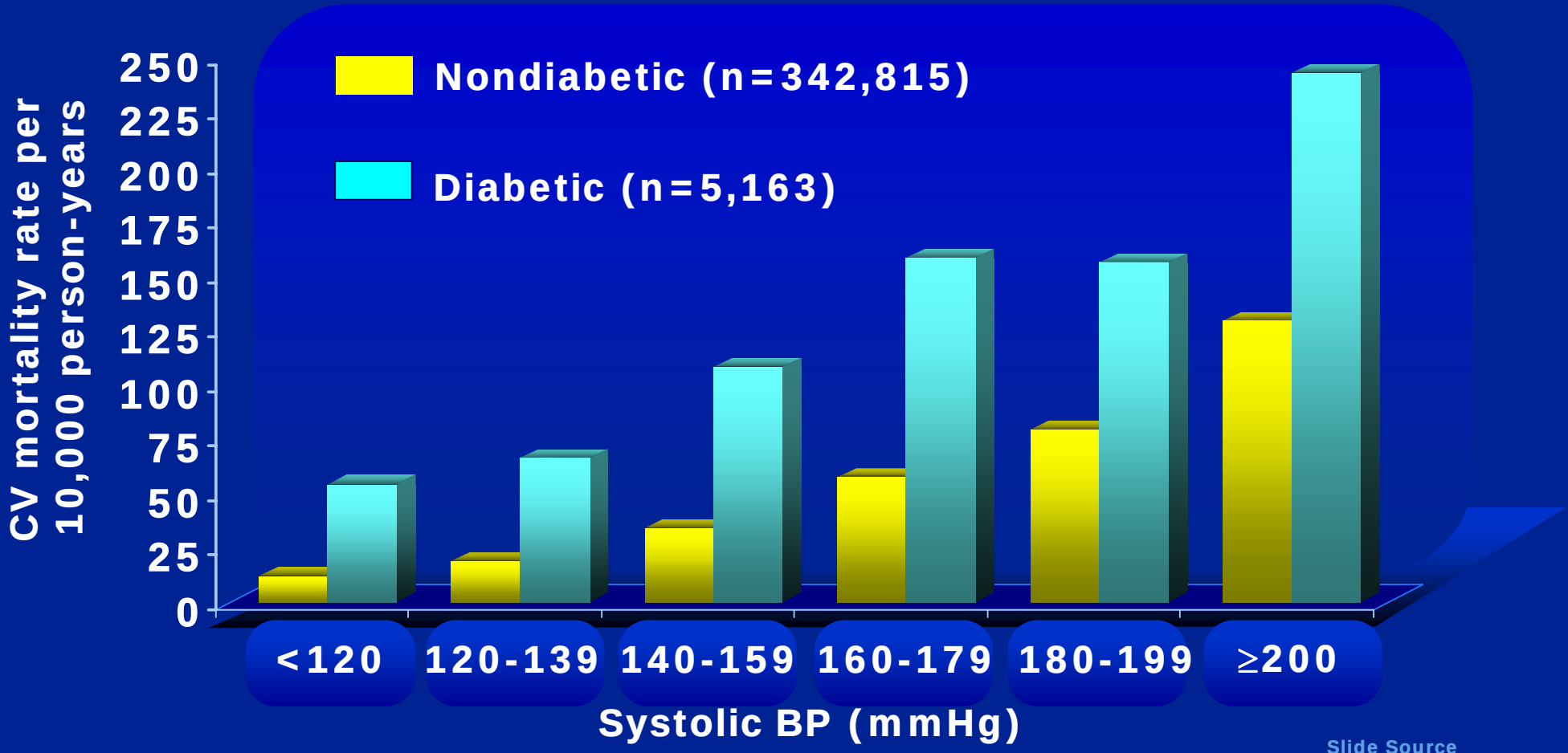


MRFIT=Multiple Risk Factor Intervention Trial

*Risk factors analyzed: smoking, hypercholesterolemia, and hypertension.

Stamler J, et al. Diabetes Care. 1993;16:434-444.

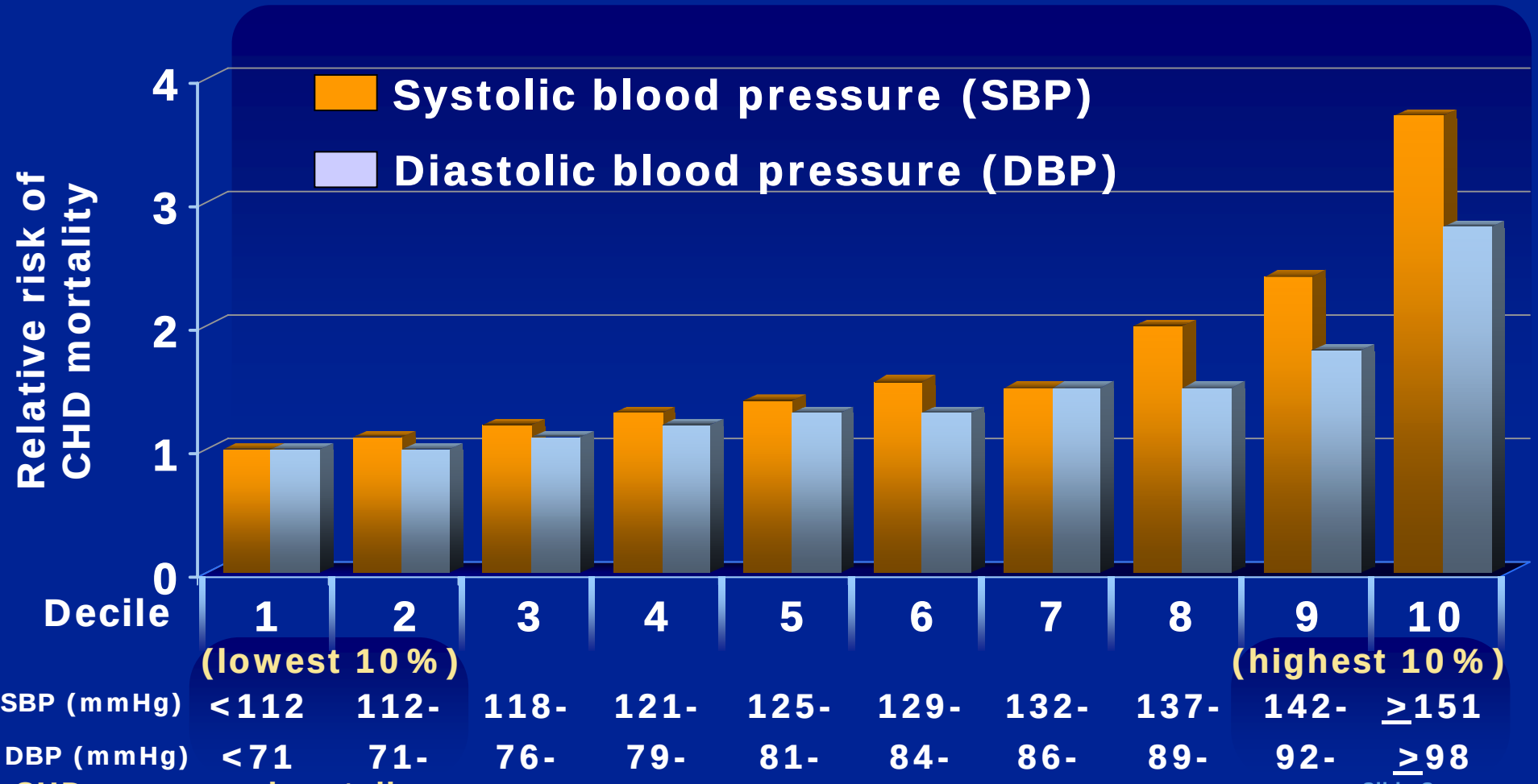
Systolic BP and CV Death in MRFIT



BP= blood pressure CV=cardiovascular MRFIT=Multiple Risk Factor Intervention Trial

Stamler J, et al. Diabetes Care. 1993;16:434-444.

Risk of CHD Death According to SBP and DBP in MRFIT



CHD=coronary heart disease

He J, et at. Am Heart J. 1999;138:211-219.

Slide Source
HypertensionOnline
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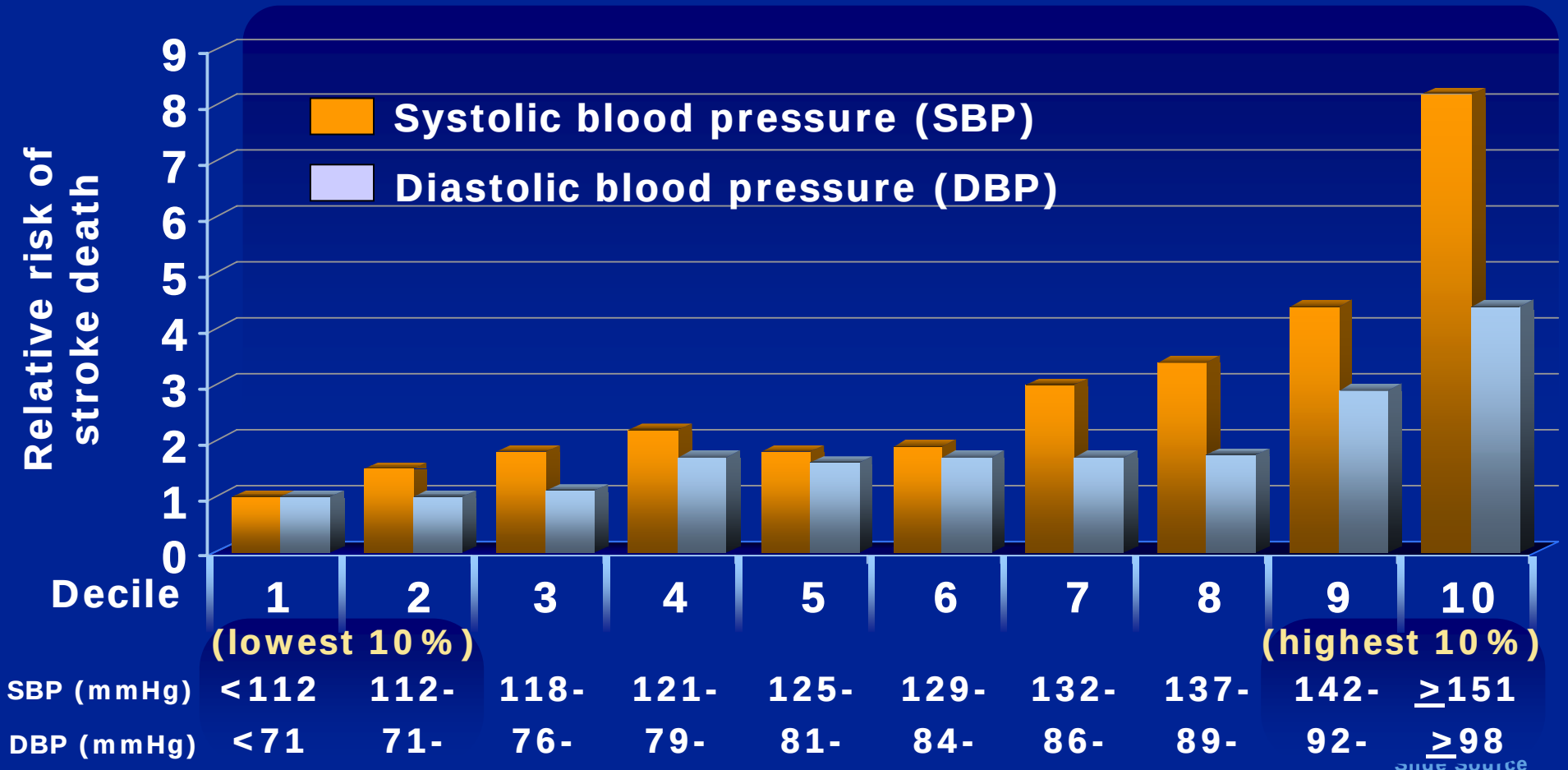
Risk of Stroke Death According to SBP and DBP in MRFIT



He J, et at. Am Heart J. 1999;138:211-219.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Introduction

Cardiovascular disease (CVD) is the single leading cause of death in American women, surpassing the combined mortality from cancer, COPD, Alzheimer's disease and pneumonia. This is a category that encompasses coronary heart disease (CHD), accounting for the greatest number of fatalities, along with stroke, congestive heart failure, hypertension, rheumatic heart disease, congenital defects and peripheral vascular disease. Historically, CVD has been misperceived as a condition that primarily affects men, underestimating the immense toll it has taken on women worldwide. The lack of awareness not only permeates the general community, but exists among medical providers as well. A 1995 Gallup poll revealed that 1 in 3 primary care physicians were not aware that heart disease was the number one cause of death in women[4]. Consequently, physicians often make different decisions for women's cardiovascular health than for men. This was aptly pointed out in a 1999 NEJM study by Schulman et al, revealing that physicians were less likely to recommend cardiac catheterization for women than for men when they were being evaluated for similar symptoms of chest pain[3].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Morbidity and Mortality

Close to half a million women die each year from complications of CVD. Since 1984, more women than men have died each year from CVD, this gap appears to be widening with nearly 67,000 more deaths each year among women. 54% of all deaths from CVD are due to CHD, 18% from stroke, 5% from HBP and 4% from peripheral arterial disease. African-American women are more likely to die from CVD than their white counterparts[1].

Here, we will discuss the two main causes of disability from CVD; CHD and stroke.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Epidemiology

Prevalence:

2001 statistics reported by the CDC/(National Center for Health Statistics) reveal that CVD afflicts one in five women. 64,400,000 people in the US have some form of CVD, including 33,300,000 women, or 22.4% of the female population. 23.8% of white females and 39.6% of African-American females are affected by CVD. The prevalence increases within older age groups[1].

Of the total number of people with CVD:

50,000,000 suffer from hypertension,

13,200,000 have coronary heart disease,

5,000,000 have congestive heart failure

4,800,000 suffer a stroke

1,000,000 have congenital heart defects

Data from NHANESIII[1]

Incidence:

Based on 44-year follow-up of participants in the NHLBI sponsored Framingham study, women developed comparative rates of CVD 10 years after that of their male counterparts. Given the improved survival of today's aging populations, we are likely to see an explosion in the incidence of CVD.

On an annual basis, we can expect that:

485,000 women will experience new or recurrent CHD

373,000 women will suffer from stroke[1]

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Cost Burden

Recent progress in cardiac research and technology has markedly improved the number of diagnostic and therapeutic options in CVD. This includes the widespread utilization of such procedures as cardiac catheterization, coronary artery bypass grafting, percutaneous transluminal coronary angioplasty (PTCA) and cardiac transplantation among others. The direct costs of CVD, including hospital charges, nursing, physician/professional costs, medications and home health care amounts to $226.7 billion. This figure increases to $368.4 billion when accounting for indirect costs of morbidity and mortality from all CVD[1].

Question 1. Direct costs of CVD refer to medical expenditures which include cost of hospital care, nursing care, physician/professional care, medications and home health care.

What expenditures do direct costs refer to?

ANSWER

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Smoking:

Tobacco use is a preventable risk factor that poses a significant threat to cardiovascular health. Although rates of smoking in the US have been declining since the 1960s, the numbers remain concerning. 21.7% of all American women, (including 18% of black females and 12.5% of Hispanic females) admit to regular tobacco use. The figures are markedly higher in Native-Americans, with 36.9% of women smokers in this subgroup. Interestingly, over 80% of people report that they started smoking before the age of 18. While cigarette smoking also substantially increases the risk of cancer, about 33.5% of tobacco-related deaths from 1995 to 1999 from tobacco were from cardiovascular complications[1].

Results from the COMMIT trial in 1995 suggest that women are far less likely to quit smoking than their male counterparts. Several reasons are suggested for this discrepancy in quit rates. Women are more likely to turn to smoking as a coping mechanism, with nicotine producing a state of euphoria and promoting psychological addiction. Indeed, there were increased rates of smoking observed in women with such co-morbidities as high stress levels and depression. Women concerned with weight may also have difficulty in quitting due to the appetite-suppressing effects of cigarette smoking[6].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Hyperlipidemia and Hypercholesterolemia:

Elevated serum total cholesterol (>200 mg/dl) and low HDL cholesterol (<40 mg/dl) are known risk factors for the development of CVD, placing these individuals at higher risk for a heart attack. 50.9% of all women have elevated serum total cholesterol levels. Beginning at age 45, more women than men have total cholesterol levels above 200 mg/dl. Of note, fewer women (14.9%) than men (39%) have problems with low HDL cholesterol[1]. Several studies have suggested that low HDL cholesterol is a more consistent predictor of CHD in older women than elevated Low Density Lipoprotein-cholesterol (LDL-c). This is an important finding, as current treatment plans that focus on the lowering of LDL cholesterol may be less useful in females[7]. Pooled cohort studies from an NHLBI workshop confirm the connection between hypercholesterolemia and CHD in women. In women younger than 65, the relative risk of dying from CHD was 2.44 in those with total cholesterol >240 mg/dl compared with women with levels <200 mg/dl. In the same women, those with LDL >160 mg/dl had a relative risk of CHD mortality 3.27 times higher than women with LDL <140 mg/dl. Moreover, in these women, having an HDL value <50 mg/dl was associated with a 2.13 times higher mortality risk from CHD compared with women whose HDL values were >60 mg/dl. In a separate study, women older than 71 with HDL levels >60 mg/dl had half the risk of CHD than women with HDL <35 mg/dl, attesting to the importance of HDL cholesterol in estimating risk in older women[7].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Physical Inactivity:

Regular moderate exercise has been proven to be a vital factor in promoting cardiovascular health. A large study by **Manson et al**. that included more than 70,000 post-menopausal women and demonstrated a 30% risk reduction for cardiovascular events with brisk walking or strenuous exercise done for a minimum of 2.5 hours per week. Sitting for prolonged periods was associated with a significant increase in risk for CVD[6]. Composite CDC/NCHS data from 1997-2003 showed that women between the ages of 18-64 were less likely to be involved in regular moderate physical activity than men of similar age. 36.2% of white females, 55.2% of black females, 57.4% of Hispanic females and 45.5% of Asian/Pacific Islander females do not meet these universal criteria for recommended physical activity. Lower socioeconomic status, lack of parental education, smoking, non-English speaking, unmarried, increased BMI and minority status are all issues associated with increased prevalence of physical inactivity.[1] It is crucial to be aware of this particular constellation of factors when working to promote healthy exercise habits among American women – the presence of multiple factors reflects increased vulnerability and greatest need for intervention.

Walking compared with vigorous exercise for the prevention of cardiovascular events in women.

N Engl J Med. 2002 Sep 5;347(10):716-25.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Obesity:

Obesity is currently a problem of epidemic proportions, with 61.9% of all American women being classified as either overweight or obese. (Overweight: BMI 25-29.9, Obese: BMI 30 and higher) In comparison, 77.3% of African-American females are either obese or overweight. This problem develops early in life, with 15.3% of children aged 6-11 being overweight per the NHANES IV data[1]. While obesity is often found in conjunction with diabetes, hypertension and hypercholesterolemia, data from the Framingham study has confirmed that it is also an independent risk factor for CVD. Interestingly, obesity appears to be a stronger predictor of CVD in women than in men[6]. In women, BMI and weight gain are more predictive of stroke risk, while abdominal obesity seems to be more useful in assessing the stroke risk for men[1]. The Nurses Health Study showed that in women with BMIs over 32, the relative risk of CHD was 4.1 compared with females having a BMI less than 19[6]. Given the widespread nature of this problem, it is imperative that physicians work with patients closely to identify the multiple factors leading to obesity and help them in achieving effective weight loss.

Information on ***Obesity from the American Obesity Association***

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Diabetes Mellitus:

While the prevalence of diabetes is similar across gender lines, this is a condition that is a much more potent risk factor for stroke in women than in men. In the general population, the risk of stroke increases from 1.8 to 6.0 for patients with diabetes. Women with diabetes are twice as likely to suffer from major CVD events than women without the condition. 5.5% of all females have diabetes, a number that has been increasing over the past decade. Those females with fewer years of education, black and Hispanic women are most likely to develop Type 2 diabetes. Women constitute 54% of the total mortality from diabetes. Interestingly, about 2.5% of all women, compared with 3.3% of men in the general population may have undiagnosed diabetes[1].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Metabolic Syndrome:

People with the metabolic syndrome are at increased risk of developing CVD. This is a syndrome that includes any three of the following in women: waist circumference >80 cm, triglycerides >150, HDL cholesterol <50, BP >130/85 and fasting glucose >110. Women have a higher prevalence of this syndrome than men in certain ethnic groups, including Mexican Americans (26% higher) and African-Americans (57% higher). Prevalence of this syndrome in women is comparable to that of men (23.4% vs 24%, respectively)[1]. The WISE study was one of the first to elucidate cardiovascular risk in women with CAD. In women with symptoms of myocardial ischemia, the presence of metabolic syndrome lowered 4-year survival and event-free survival from major cardiovascular events if CAD was detected angiographically[14].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

High Blood Pressure (HBP):

Hypertension, defined as a systolic blood pressure of 140 mmHg or higher and a diastolic blood pressure of 90 mmHg or higher, poses clear risks for the development of adverse events from CVD. In 2001, 32.1% of all females had HBP. There appears to be a racial predilection here as well, with 44.7% of all black females with HBP. Black women have an 85% higher rate of utilization of ambulatory medical services for HBP than white women[1]. The prevalence of HBP markedly increases as women age. Under the age of 50, males have an average systolic blood pressure that is 7 mmHg higher than females. However, by age 60, women have systolic blood pressures that are higher than men[6]. Women taking oral contraceptive pills have 2-3 times the rates of HBP than in the general population, and this is especially the case in older, obese females[1]. Women with HBP have 4 times the relative risk of myocardial infarction, more than 7 times the risk of fatal coronary events and 3-4 times the risk of CHD when compared to the general population. Recent data from the Women's Health Initiative showed that only 36.1% of women with HBP had acceptable control of their blood pressure, with 71% of women over the age of 70 with inadequate control[6]. These are unacceptable figures that suggest the need for more aggressive methods of achieving optimal control of blood pressure.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Psychological Risk Factors:

This is a set of under-appreciated elements that contribute to CHD risk in women. Many have suggested that depression, anger, anxiety, hostility and type-A personality may be associated with CHD. They have hypothesized that such emotional states not only lead to higher prevalence of other risk factors such as smoking, obesity and hypercholesterolemia but may also have direct effects on the cardiovascular system. Depression, for example, may be a precursor to an MI. Other studies suggest an association with hopelessness and CHD. 20 year follow-up results of the Framingham study demonstrated that tension and anxiety were independent predictors of fatal and nonfatal coronary events in women[6]. Given the prevalence of psychological problems among women in the US, it is clear that larger scale studies are necessary to clarify the mechanisms through which mental health affects cardiovascular health in women.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Factors

Other Risk Factors Unique to Women:

There are a number of other rare conditions more commonly seen in women that pose a threat to cardiovascular health. These include fibromuscular dysplasia, choriocarcinoma, mitral annular calcification, current pregnancy, migraine, mitral valve prolapse, antiphospholipid syndrome, Takayasu's arteritis, retinocochleocerebral vasculopathy and systemic lupus erythematosus.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Screening

Lipids:

The National Cholesterol Education Program's (NCEP) most recent recommendations from the Third Adult Treatment Panel (ATP III) program in 2001 advise screening for all women over the age of 20 with a fasting lipid profile at a minimum of every 5 years. Additionally, the US Preventive Services Task Force recommends the following:

1. Routinely screen women >45 yrs for lipid disorders
2. Screen younger women (20-45) if they have other risk factors for CHD
3. Screening should consist of a total cholesterol, HDL cholesterol (HDL-C); using HDL-C in combination with total cholesterol can improve the identification of those at greater risk for cardiovascular disease
4. The evidence is insufficient to recommend for or against screening for elevated triglycerides
5. Repeat measurements should be made when lipids are near a level that would warrant therapy; lipids can be repeated less often in those who have had repeatedly normal or low levels
6. Lipid levels are less likely to change in older people, so repeated screening may be less important
7. Any treatment decisions take into account not only the cholesterol level but also the individual's overall risk of coronary heart disease[7].

NCEP's Cholesterol Guidelines

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Screening

Smoking:

Ask patients about quantity and frequency of tobacco use.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Screening

Hypertension:

Every woman must have her blood pressure checked at least once every two years and yearly after age 40. Optimal BP is 120/80, but acceptable BP values are less than 130/85 mmHg[11].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Screening

Diabetes Screening:

Major risk factors for type 2 diabetes (non-insulin dependent) are BMI > 25 kg/m2, family history of diabetes in a first degree relative, Native American/Hispanic/Black race, age > 45 years, Impaired Glucose Tolerance/Impaired Fasting Glucose (IFG), BP > 140/90 mmHg, dyslipidemia (HDL-C < 35 mg/dl), or triglycerides > 250 mg/dl, history of gestational diabetes or delivery of infant > 9 lbs. Other risk factors are smoking, polycystic ovary syndrome and dietary factors such as low fiber diets and high glycemic load. The American Diabetic Association recommends screening patients with one or more of these major risk factors for diabetes every three years. Additionally, patients presenting with polyuria, polydipsia and polyphagia should also be screened. Demonstrating a fasting plasma glucose value > 126 mg/dl on two different occasions confirms the diagnosis of diabetes mellitus. Women with IFG (fasting glucose between 110-125 mg/dl) must be re-tested annually[11].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Screening

Weight Monitoring:

Determine BMI; **BMI Calculator** . Determine waist to hip ratios (WHR).

Classifying Weight Category Using BMI:

Underweight: BMI (kg/m2) <18.5

Normal 18.5-24.9

Overweight 25.0-29.9

Obese 30.0-39.9

Extreme (morbid) obesity > 40

Women with WHR >0.8 and waist measurement > 35 inches are at increased risk for MI and stroke[11].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Screening

Others:

Assess patients' level of physical activity. Ask about dietary habits (Are they consuming a low-fat, low-cholesterol diet, rich in fiber, fruits, vegetables and low in saturated fats). Assess for psychosocial stressors and symptoms of anxiety, depression, tension, type-A personality. Monitor medication usage

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Screening

CRP:

Recent findings from the Womens' Health Study reveal that high sensitivity C-reactive protein (hs-CRP) may be a more sensitive marker for cardiovascular disease than LDL- cholesterol in women, predicting CVD risk in women without hyperlipidemia and could also be a prognostic marker in the setting of metabolic syndrome in women. This inflammatory marker is a potentially useful screening modality, especially given that almost half of all myocardial infarctions and strokes occur in people without overt hyperlipidemia[10].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Diagnosis

History:

There are a number of sex differences in symptomatology and diagnostic testing that complicate recognition of CVD in women. For example, making the diagnosis of CAD based on patient history in women can be problematic. Women tend to experience more atypical chest pain symptoms than men. They are also more likely to have rest pain, pain awakening them from sleep and mental stress-induced angina. Additionally, women present more often than men with non-chest symptoms such as nausea, back pain and jaw pain. As discussed in previous sections, women may have more co-morbidities secondary to advanced age at presentation, including diabetes, hypertension and hyperlipidemia[9].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Diagnosis

Noninvasive Diagnostic Tests:

Conventional diagnostic modalities may be comparatively less useful in women than in men. Lower CAD prevalence rates in women reduce the positive predictive value of an exercise ECG in women, and lead to higher rates of false positive results. Some authors have postulated that the ECG response to exercise may also vary with the menstrual cycle and with hormone replacement therapy. They have also suggested that women may have subclinical left ventricular hypertrophy, hormone-induced ECG changes and abnormalities as mitral valve prolapse that may affect the exercise stress ECG. Sex differences in exercise capacity as well as in the catecholamine response to exercise might also account for the lower reliability of the exercise stress test in women[9].

Given the lower utility of stress ECG testing in women, the addition of an imaging modality to the study may be useful. Thallium-201 has not been found to be as useful in women as there is the tendency for photon attenuation through breast tissue and subsequent misinterpretation of perfusion abnormalities. The American College of Nuclear Cardiology recommends SPECT as the preferred exercise perfusion modality in females as it penetrates breast tissue more reliably.. Exercise echocardiography has also been shown to be superior to exercise ECG testing in women, making it the initial test of choice in women with an intermediate risk of CAD[9].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Diagnosis

Invasive Diagnostic Testing:

There are a number of studies that suggest a gender discrepancy in patients referred for angiographic evaluation for CAD. Higher rates of angiography and revascularization procedures are noted in men in several retrospective studies. In one study, women who suffered an MI were noted to be as likely as men to have angina and be treated with anti-anginal medications. However, fewer women undergo cardiac catheterization, with men twice as likely to undergo angiography and revascularization procedures as women. In a different study, in situations where the clinical suspicion for CAD is high, there were no gender differences noted in referral for angiography. However, in circumstances where the diagnosis was blurred, angiography was less likely to be recommended for women than men[12]. While there may be complex reasons for these disparities, physicians must ensure that women are receiving appropriate diagnostic interventions to detect CVD.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Risk Stratification

The spectrum of risks from CVD are nicely summarized in a recent publication from the American Heart Association that examines the evidence basis for CVD risk stratification in women. CVD risk in women can be calculated using the Framingham Risk Score.

Framingham Risk Score Calculator

TABLE 1. Spectrum of CVD Risk in Women

Risk Group	Framingham Global Risk (10-year Absolute CHD Risk)	Clinical Examples
High risk	>20%	• Established CHD • Cerebrovascular disease • Peripheral arterial disease • Abdominal aortic aneurysm • Diabetes mellitus • Chronic kidney disease†

‡

Intermediate risk	10% to 20%	• Subclinical CVD‡(eg, coronary calcification) • Metabolic syndrome • Multiple risk factors§ • Markedly elevated levels of a single risk factor|| • First-degree relative(s) with early-onset (age: <55 y in men and <65 y in women) atherosclerotic CVD
Lower risk	<10%	• May include women with multiple risk factors, metabolic syndrome, or 1 or no risk factors
Optimal risk	<10%	• Optimal levels of risk factors and heart-healthy lifestyle

CHD indicates coronary heart disease; CVD, cardiovascular disease.

*Cerebrovascular disease may not confer high risk for CHD if the affected vasculature is above the carotids. Carotid artery disease (symptomatic or asymptomatic with >50% stenosis) confers high risk.

†As chronic kidney disease deteriorates and progresses to end-stage kidney disease, the risk of CVD increases substantially.

‡Some patients with subclinical CVD will have >20% 10-year CHD risk and should be elevated to the high-risk category.

§Patients with multiple risk factors can fall into any of the 3 categories by Framingham scoring.

||Most women with a single, severe risk factor will have a 10-year risk <10%.

*Mosca et.al **Evidence Based Guidelines for Cardiovascular Disease Prevention in Women**. Circulation 2004: 109:672-693*

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

Over the past decade, we have witnessed major strides in understanding cardiovascular disease in women. Most recently, the need for larger-scale prevention efforts led to the launch of a nation-wide campaign in March 2004 by the National Heart, Lung and Blood Institute called “The Heart Truth: A National Awareness Campaign for Women about Heart Disease.” Involving programs on the national as well as the regional levels, this is a comprehensive action plan that seeks to increase awareness about heart disease in women and empower women to make more informed decisions about their cardiovascular health. A popular aspect of this campaign is the “red dress” program, reminiscent of the “pink ribbon” recognized as a symbol for breast cancer awareness.

Read about it: ***The Heart Truth***

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

High-Risk Women (>20% 10-year risk of CVD events)

Class I recommendations: (Intervention is useful and effective)

- Smoking cessation: urge smoking cessation as well as reducing exposure to environmental smoke
- Physical activity/cardiac rehabilitation: encourage at least 30 minutes of moderate-intensity physical activity every day or most days of the week. Women with a recent acute coronary syndrome or coronary intervention or new-onset/chronic angina should participate in a comprehensive risk reduction program such as cardiac rehabilitation or a physician-guided home or community-based program
- Diet therapy: Encourage a heart healthy diet that is rich in fruits, vegetables, grains, low-fat or nonfat dairy products, fish, legumes, low saturated fat sources of protein. Limit saturated fat to <7 % of calories. Limit cholesterol intake to <200 mg/day
- Weight maintenance/reduction: Encourage diet control, physical activity to maintain weight between BMI of 18.5 and 24.9 kg/m2 and waist circumference <35 in; **BMI Calculator**

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

Intermediate-Risk Women (10-20% 10 year risk of CVD events)

Class I recommendations:

- Smoking cessation
- Physical activity
- Heart healthy diet
- Weight maintenance/reduction
- Blood Pressure control
- Lipid control: Initiate LDL-c lowering therapy (preferably a statin) if LDL-C > 130 mg/dl despite lifestyle modifications. Consider niacin/fibrate therapy if HDL-C is low (<40mg/dl)

Class IIa recommendations:

- Aspirin therapy: consider aspirin therapy (75 to 162 mg) in intermediate-risk women as long as BP is controlled and benefit is likely to outweigh the risk of GI side effects

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

Lower-Risk Women (<10% 10 year risk of CVD events)

Class I recommendations:

- Smoking cessation
- Physical Activity
- Heart healthy diet
- Weight-maintenance/reduction
- Treat individual CVD risk factors as indicated

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

Stroke Prevention Among Women with Atrial Fibrillation

Class I recommendations:

- High-intermediate risk of stroke:
- Warfarin therapy: use in women with chronic or paroxysmal atrial fibrillation and maintain INR 2-3 unless there is a high-risk of bleeding

Low risk of stroke (<1% /year) or contraindication to warfarin:

- Aspirin therapy: (325 mg) should be used in women with chronic or paroxysmal atrial fibrillation with a contraindication to warfarin or at low-risk for stroke

Adapted from AHA guidelines (8)

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

Additional Prevention Issues: (see Research section)

The Women's Health Initiative failed to demonstrate a beneficial effect of hormone replacement therapy in the primary prevention of CHD in women with either estrogen alone or combination estrogen-progestin therapy. Instead, women on hormone therapy were noted to have a higher risk of CHD and other CVD events. The HERS and HERS-II studies confirmed the lack of utility of hormone replacement therapy for the secondary prevention of CHD. Here, too, women on hormone regimens were noted to have a higher risk of adverse CVD and non-CVD events. Thus, it is not recommended that hormone replacement therapy be initiated for the primary or secondary prevention of CVD.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Links to Available Prevention Programs

Smoking:
National Heart Lung and Blood Institute Smoking Information
American Lung Association
CDC Tobacco Information and Prevention Program
Quitnet

Physical Activity:
AHA's Just Move Campaign
National Heart Lung and Blood Institute's Website for Physical Activity and Women

Weight Management:
National Heart Lung and Blood Institute Information on Weight Loss
Brigham and Womens Site for Weight Loss
Cooking the Heart Healthy Way

Hormone Replacement Therapy:
Brigham and Womens Website on Hormone Replacement Therapy

Lowering Cholesterol:
NCEP Cholesterol Information
NCEP Site on ATP III Guidelines
Executive Summary on ATP III Guidelines

Managing Diabetes:
Diabetes Management Tools from National Diabetes Education Program
Principles for Diabetes Management from National Diabetes Education Program

Managing High Blood Pressure:
Controlling High Blood Pressure: A Woman's Guide
Controlling High Blood Pressure: A Guide for Older Women
NIH/NHLBI Info on High Blood Pressure
The DASH Eating Plan

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Research

HERS: Heart and Estrogen/Progestin Replacement Study

This was a randomized, blinded placebo-controlled trial involving 2763 post-menopausal women who were randomized to an estrogen/progestin combination or placebo. This study demonstrated that combination hormone therapy in subjects with heart disease did not prevent further heart attacks or death from CHD. There was, however, an increase in thrombotic complications, such as DVT and PE. The therapy was associated with positive effects on lipoproteins, with a lowering of LDL-cholesterol and increase in HDL-cholesterol.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Research

HERS II:

This follow-up trial to HERS was an open-label observational follow-up that examined the effects of combination hormone therapy on non-cardiovascular outcomes on the original HERS participants. Women continued to receive estrogen + progesterone vs. placebo at the discretion of their physician. Findings were that this regimen increased the risk of venous thromboembolism as well as biliary tract surgery in post-menopausal women with known CHD. The non-cardiovascular outcomes of combination hormone therapy were concluded to be unfavorable.

HERS II

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Research

WHI: Womens' Health Initiative

This is a larger scale trial involving two arms

a) estrogen+progestin arm: This involved over 16,000 healthy post-menopausal women with no prior history of CHD who were randomized to either receive an estrogen/progestin combination or placebo.

The trial was discontinued prematurely after a 5-year follow-up period after findings indicated that combination therapy actually increased the risk of CHD in healthy post-menopausal women. There was a 24% overall increase in CHD risk and an 81% risk of CHD in the initial year of starting hormone therapy. There was also a significant increase in the risk of breast cancer, stroke and blood clots. The authors concluded that there are no cardiovascular benefits from combination hormone therapy and recommended against the use of this therapy in healthy post-menopausal women to prevent CVD.

WHI Website: Combination Hormone Therapy

NEJM Website - Combination Hormone Therapy

b) estrogen-alone study: This study randomized 11,000 healthy post-menopausal women with no prior history of CHD to either estrogen or placebo. The study had to be prematurely stopped in March 2004 after a 7-year follow-up period as estrogen was not seen to increase or decrease the risk of CHD. However, there was a significantly increased risk of stroke, which was one of the reasons the study had to be halted. The authors concluded that estrogen was not beneficial for the prevention of CHD and could actually increase the risk of other CVD events.

Estrogen Alone Study

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Research

WAVE: Womens' Angiographic Vitamins and Estrogen Study

This study involved post-menopausal women with angiographic evidence of coronary artery disease and investigated whether estrogen therapy and the use of Vitamins C and E could prevent worsening of coronary artery disease. In a three year follow-up, no benefit with regards to angiographic improvement was seen with any of these therapies. Instead, there was a significant increase in death, MI and stroke in both the hormone treated patients as well as those who received vitamins.

WAVE Study Overview

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Research

WISE: Womens' Ischemia Syndrome Evaluation Study

This multi-center study begun in 1996 followed 1000 women who had experienced symptoms of ischemia and were either scheduled for or had already undergone angiography. Some of the key findings were that pre-menopausal women with lower estrogen levels had a higher risk for heart disease. They also showed that the use of statins did not affect reproductive hormone levels in women. One of the major findings in this study was that women without angiographic evidence of coronary artery blockage, but with symptoms of ischemia did have evidence of underlying cardiac disease by MRI spectroscopy. 20% of women with no angiographic blockages were noted to have a positive MR spectroscopy test during exercise, indicating inadequate coronary perfusion. The study is now focused on investigating the reasons why this phenomenon occurs, with some investigators suggesting that in these symptomatic women with a negative angiogram, pathology may exist in smaller-caliber vessels. They believe that womens' microvasculature is not easily visualized during a conventional angiogram.

WISE Study

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Breast Cancer

Introduction

Breast cancer has become the most common cancer among women in the United States, excluding skin cancers, and the second leading cause of cancer death among North American women. Screening for breast cancer and breast cancer prevention has important and measurable effects on the morbidity and mortality associated with breast cancer. Physicians have important roles in communicating the options, risks and benefits, and potential outcomes of these procedures and interventions. Applying accepted screening recommendations and prevention strategies allows physicians to help their patients reduce their risk of developing breast cancer, increase breast cancer detection at an early stage, and improve clinical outcomes.

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CHILDHOOD IMMUNIZATIONS

Introduction

Routine Childhood Immunizations

Vaccines are a well known example of primary prevention. They are considered to be one of the most successful public health initiatives of the 20th century. Prior to the advent of vaccines, vaccine-preventable diseases were a major cause of morbidity and mortality[1].

Currently in the United States, children are vaccinated against 11 diseases: Hepatitis B, diphtheria, tetanus, pertussis, *H. influenzae* type B, measles, mumps, rubella, varicella, *S. pneumoniae*, and influenza. Except for influenza, these immunizations are usually given at well-child appointments during the first 2 years of life[2]. The influenza vaccine is given after 6 months of age and is given on an annual basis. This vaccine is reformulated yearly, based on the virus strains that are predicted to be active during the upcoming influenza season (October through March)[3].

Every January, the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians issue an updated national immunization schedule, which incorporates any new recommendations or vaccines

Recommended Childhood and Adolescent Immunization Schedule United States. July – December 2004

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HYPERTENSION

JNC 7

JNC 7: Changes from JNC 6

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) is based on new evidence highlighting more effective management strategies for hypertension. An Express version of the JNC 7 has been provided for busy physicians and a full report will follow which includes a detailed account of the guidelines and supplemental tools for professional and patient education. That the previous guidelines were not being used to full potential has sparked the revision of the JNC 6 and prompted the Coordinating Committee to create additional learning resources, clearer and more concise guidelines, and simpler classifications of blood pressure.

The new information presented in the JNC 7 includes the following:

- New category designated prehypertension
    - Patients with prehypertension are at increased risk for progression to hypertension; those in the 130-139/80-89 mm Hg range are twice as likely to develop hypertension as those with lower values.[36]
- Stages 2 and 3 hypertension have been combined

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HYPERTENSION

JNC 7

JNC 7 Key Messages of the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure:[3]

- In persons older than 50 years, systolic blood pressure greater than 140 mm Hg is a much more important cardiovascular disease (CVD) risk factor than diastolic blood pressure.
- The risk of CVD beginning at 115/75 mm Hg doubles with each increment of 20/10 mm Hg; individuals who are normotensive at age 55 have a 90 percent lifetime risk of developing hypertension.
- Individuals with a systolic blood pressure of 120-139 mm Hg or a diastolic blood pressure of 80-89 mm Hg should be considered prehypertensive and provided with instructions on health-promoting lifestyle modifications to prevent CVD.
- Thiazide-type diuretics should be used in drug treatment for most patients with uncomplicated hypertension, either alone or combined with drugs from other classes. Certain high-risk conditions are compelling indications for the initial use of other antihypertensive drug classes (angiotensis converting enzyme inhibitors, angiotensin receptor blockers, beta blockers, calcium channel blockers).
- Most patients with hypertension will require two or more antihypertensive medications to achieve goal blood pressure (<140/90 mm Hg, or <130/80 mm Hg for patients with diabetes or chronic kidney disease).
- If blood pressure is >20/10 mm Hg above goal blood pressure, consideration should be given to initiating therapy with two agents, one of which usually should be a thiazide-type diuretic
- The most effective therapy prescribed by the most careful clinician will control hypertension only if patients are motivated. Motivation improves when patients have positive experiences with, and trust in, the clinician. Empathy builds trust and is a potent motivator.
- In presenting these guidelines, the committee recognizes that the responsible physician's judgment remains paramount.

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HYPERTENSION

JNC 7

JNC VI Goals for BP Control[27]

- Reduction in blood pressure to <140/90 for individuals with essential hypertension*.

  » Goal achieved: 27%

*Essential hypertension: Primary hypertension. Without an identified cause.

Table 3.

NHANES - Trends in Awareness, Treatment, and Control of High Blood Pressure in Adults Ages 18 – 74*[28]

	NHANES II	NHANES III (Phase 1)	NHANES III (Phase 2)	
	1976-1980	1988-1991	1991-1994	1999-2000
Aware	51%	73%	68%	70%
Treatment	31%	55%	54%	50%
Control† (to below 140/90)	10%	29%	27%	34%

* High blood pressure is systolic blood pressure (SBP) ≥140mm Hg or diastolic blood pressure (DBP) ≥90 mm Hg or taking antihypertensive medication.

†SBP <140 mm Hg and DBP < 90 mm Hg

These increases in awareness, treatment and control of hypertension has led to a decrease in the age adjusted death rates from stroke by 60%[29] and from coronary heart disease by 53%[30]

The benefits are particularly striking in women >50yrs

However, since 1993…

- Age adjusted stroke rates have risen slightly
- Changes in age adjusted coronary heart disease levels have not declined
- ESRD and heart failure have increased.

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HYPERTENSION

JNC 7

Healthy People 2010 Goals

- Reduce the proportion of adults with high blood pressure from 28% to 16%
- Increase the proportion of adults with high blood pressure whose pressure is under control from 18% to 50%[25]
-  Increase the proportion of adults with high blood pressure who are taking action (for example, losing weight, increasing physical activity, or reducing sodium intake) to help control their blood pressure from 82% to 95%[26]

- To increase the proportion of adults who have had their blood pressure measured within the preceding 2 years and can state whether their blood pressure was normal or high from 90% to 95%[7]

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HYPERTENSION

Public Health Challenges of Hypertension

- Prevent the rise of blood pressure with age
- Decrease existing prevalence of hypertension
- Increase hypertension awareness and detection
- Improve control of hypertension
- Reduce cardiovascular risks
- Increase recognition of the importance of controlled isolated systolic hypertension
- Improve recognition of the importance of high-normal blood pressure
- Reduce ethnic socioeconomic and regional variations in hypertension
- Improve opportunities for treatment
- Enhance community programs

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HYPERTENSION

Epidemiology

Prevalence

Based on the Third National Health and Nutrition Examination Survey (NHANES III), approximately 43 million noninstutionalized US adults, 18 years or older, met the criteria for diagnosis of hypertension… recommended in the [JNC VI]. Almost 13 million additional persons had been diagnosed as having hypertension by a health care professional but did not meet the previously mentioned JNC VI criteria. Approximately 20 million of the estimated 43 million persons with hypertension were not being treated with antihypertensive medication; and almost 12 million of the nearly 23 million for whom such medication was being prescribed had inadequately controlled hypertension.

Prevalence among those over 20 years is approximately 22% and 26% according to the CDC, National Health and Nutrition Examination Survey (NHANES), National Center for Health Statistics (NCHS), 1988-94 and 1999-2002 respectively, with the rates being highest for Black non-Hispanic females (35%, 39%), followed by Black non-Hispanic males (34%, 37%) and lowest for white females (18%, 23%), followed by Mexican females (21%, 23%).

Table 67. Hypertension among persons 20 years of age and over, according to sex, age, race, and Hispanic origin: United States, 1988–94 and 1999–2002

[Data are based on physical examinations of a sample of the civilian noninstitutionalized population]

Data Tables are available from the **National Center for Health Statistics: National Health and Nutrition Examination Survey**.

Typically, blood pressure rises with age; however this is not always the case. Evidence from the Framingham Heart Study suggests that “the residual lifetime risk for hypertension is 90 percent and the probability of receiving antihypertensive medication is 60 percent for middle-aged and elderly individuals"

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HYPERTENSION

Epidemiology

Health Risks Associated with Hypertension

Hypertension is a risk factor for two of the three leading causes of death in the United States, Heart Disease and Stroke.

- Risk factors for hypertension are also risk factors for cardiovascular disease and stroke, dyslipidemia, diabetes, and CHD mortality (ref CHD and stroke deaths chart – CDC, also prevalence of risk factors for heart disease and stroke chart)
    - Leading causes of death 1997: heart disease – 31.4%, stroke 6.9%, chronic obstructive pulmonary disease 4.7%, diabetes 2.7% kidney disease 1.1%
    - 1st, 2nd, 3rd leading causes of death in age group >65 is heart disease, cancer, stroke. (ref chart for the prevalence of contributors – hypertension, coronary heart disease, stroke, rheumatic heart disease also leading cause of death table by sex, age, race)
    - Third leading cause of death in 25 – 44 age group is heart disease. Second leading cause of death in age group 45 to 64 is heart disease.
- Hypertension is the most common precursor to cardiovascular disease and stroke.
- The relationship between hypertension and cardiovascular disease is “strong, continuous, graded, consistent, independent, predictive, and etiologically significant for those with and without coronary heart disease (CHD)”
- There is no convincing evidence for a J curve or threshold value below which the risk for cardiovascular and renal disease does not exist.
- The observed association of risk is stronger for systolic blood pressure than the corresponding diastolic blood pressure.
- In one recent report, low risk individuals (non-smokers, serum cholesterol <200mg/dL [5.18mmol/L, blood pressure ≤ 120/80 mmHg) have 72 – 85% lower cardiovascular disease mortality and 40 – 59% lower all cause mortality when compared to persons with at least one of the three mentioned risk factors.
- End Stage Renal disease
- “For individuals 40 – 70 years of age, each increment of 20 mm Hg in systolic BP (SBP) or 10 mm Hg in diastolic BP (DBP) doubles the risk of CVD across the entire BP range from 115/75 to 185/115 mm Hg.”

One half of the decline seen in death rates from stroke in white women and 2/3 of the decline seen in African American women can be attributed to a decline in blood pressure

- Dramatic improvements have slowed in recent years and the age adjusted stroke rates have risen slightly and the slope of the age adjusted rate of decline in CHD appears to be leveling
- Rates for end stage renal disease have increased, high blood pressure is the most common antecedent to ESRD
- Prevalence of heart failure has also increased, for which hypertension is the most common precursor.
- Hypertension control rates have not continued to improve.
- If trends in the awareness, treatment and control established between 1976 – 1980 and 1988 – 1991, continued, in 1994 the awareness would have been 76.2%, treatment 59.6%, control 31.2%.

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HYPERTENSION

Epidemiology

Cost Burden

The financial burden of hypertension is estimated at 37 billion each year, with antihypertensive medications contributing approximately 15.5 billion per year.

Heart disease and stroke, the first and third leading causes of death and disability, and for which hypertension is a major risk factor, pose a financial burden of approximately $259 billion in direct and indirect costs.

In one study, ***An Economic Evaluation of the JNC Hypertension Guidelines Using Data from a Randomized Controlled Trial***, the management of hypertension including drug therapy, monitoring for and treating side effects, compliance, and the costs of switching after therapeutic failures resulted in the following costs for initial treatment and control of hypertension per patient (first year cost of therapy):

Chlorthalidone, $641

Acebutolol, $920

Amlodipine, $946

Enalapril, $948

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COST BARRIERS

Virtual Patient Scenarios

A 36-year old woman comes to your booth at the health fair at her church to have her cholesterol checked. The reading is 283. After you inform her of the results, she indicates an interest in doing something about this, but is concerned that she can't afford medication to lower her cholesterol. A. Aside from recommending that this woman seek advice from her regular physician, what advice can you provide her today that might be effective in helping her lower her cholesterol value? B. What else might she do to lower her overall cardiovascular risk? C. What low-cost pharmacologic options might her primary care physician mention to lower her cholesterol?

ANSWER

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OVERCOMING SYSTEM-LEVEL BARRIERS TO PREVENTION

Virtual Patient Scenarios

You are finishing a hectic day in primary care clinic and are seeing your last patient who is here to establish care. He is a 58-year-old retired mechanic with diabetes mellitus, hypertension, a previous heart attack, obstructive sleep apnea, and depression. He is obese; his blood pressure is 155/98, he has leg swelling and a cellulitis. You develop a plan to address his many chronic problems but realize after he has left that you have forgotten to address several aspects of routine health maintenance including colorectal cancer screening, previous immunization with tetanus, influenza, and pneumococcal vaccines, and lipid profile assessment. To avoid similar mistakes with future patients, what things can you do to ensure that individuals under your care will receive recommended preventive services?

ANSWER

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Cardiovascular Disease:

The American Heart Association

This site has information on warning signs, diseases and conditions (arrhythmia, cholesterol, diabetes, heart attack, chronic heart failure, hypertension, etc.), advocacy, events, news and publications. The site also provides information for women and children and information in Spanish.

American Heart Association Site for Professionals

The Heart Profilers

This site from the American Heart Association. Provides information about strokes, and also a personalized profile that relays information about heart disease and other issues. Other topics include high blood pressure and cholesterol. This site has links for children and links in Spanish.

MedlinePlus: Heart Diseases

This NIH site provides an abundance of resources with links to information on the latest news, treatments, clinical trials, prevention and screening, and research. This complete site also provides links for diagnosis and symptoms, specific conditions, rehabilitation, genetics, organizations, statistics and links to sites for men, women, children, and seniors.

CDC –Chronic Disease Programs: Heart Disease

National Center for Health Statistics - FASTATS

State Fact Sheets about Heart Disease Among Men

State Fact Sheets about Heart Disease Among Women

National Heart Lung and Blood Institute

This site has information for patients, professionals and researchers. The information on this site includes clinical practice guidelines for asthma, cholesterol, hypertension, obesity, and other conditions. The site also has information for funding, training, policies, clinical trials, networks and outreach and news and events.

Texas Heart Institute – Heart Information Center

This site provides educational information related to the prevention, diagnosis and treatment of cardiovascular disease.

The National Women's Health Information Center

A site by the U.S. Department of Health and Human Services. This site presents FAQ's and Fact Sheets on Heart issues for women.

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Cancer:

Oncolink: Abramson Cancer Center of the University of Pennsylvania

This site provides information on the types of cancer, treatment options, clinical trials, news, CME activities and links to other cancer resources.

American Cancer Society

This complete site has information for professionals and patients. Information for professionals include facts and figures, statistics, prevention and early detection, publications, medical updates, media information, research programs and jobs. The site also includes a **bookstore** with books for patients, family and friends; medical and clinical journals; and books for healthcare professionals. Asian Language materials as well as information in Spanish provided.

National Cancer Institute

This U.S. National Institutes of Health site provides information on the types of cancer (list A to Z), Clinical Trials, statistics, treatment, prevention, genetics, causes, screening and testing, research and funding, news, and a **Physician Data Query - PDQ®.** The PDQ® is an NCI database that provides the latest information on all the cancer topics listed above. Information is also available in Spanish.

Canadian Cancer Society

Information on this site is available in English or French. Information includes clinical trials, statistics, media releases, risk reduction, publications, hair donations, and a **cancer glossary.**

Medline Plus: Cancer

This site from the National Institutes of Health – NIH provides links to information on latest news, diagnosis and symptoms, treatment, clinical trials, alternative therapy, specific conditions, prevention and screening, nutrition, disease management, research, genetics, law and policy and statistics. The site also has specific information for men, children and seniors.

Cancer News

The latest news and information on diagnosis, treatments and prevention. In addition to cancer updates, this site also provides links to other cancer resources.

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Children and Adolescents:

4 Girls Health

A site by the National Women's Health Information Center, a Division of the Department of Health and Human Services. This site encourages adolescent girls ages 10-16 to choose and adopt healthy behaviors. Information is available on fitness, nutrition, stress management, peer pressure, bullying, suicide, drugs/alcohol/smoking, self-esteem and other topics. Resources are available for parents and caregivers as well as educators. The site is interactive and user friendly and offers free gifts.

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Nutrition & Exercise:

5 A Day Campaign

From the Centers for Disease Control and Prevention, this is a "5 A Day" campaign to promote ways to include the required 5 to 9 servings of fruit and vegetables into your mealtime. The site has information for patients including serving size descriptions, fast ways to get your "5 A Day", affordable ways to get your "5 A Day" as well as recipes.

Delicious Decisions

From the American Heart Association – this is a very useful and healthy cookbook. It shows how delicious can also be nutritious and it also provides information on how to achieve a well balanced diet; smart food shopping, including how to read food labels; eating out healthy; snacking and exercise.

Fitness Center – Just Move

Very good website from the American Heart Association with general health and exercise information. Provides links to other health resources, and a nice exercise log.

Kids Health for Parents

This site provides information on fitness and nutrition for children, especially for picky eaters. This site also provides fitness information on how to encourage children who hate sports to play outside.

NEW!!! **Dietary Guidelines for Americans 2005**

Dietary Guidelines for Americans is published jointly every 5 years by the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA). The *Guidelines* provide authoritative advice for people two years and older about how good dietary habits can promote health and reduce risk for major chronic diseases.

This site provides brochures and media and audio files. Resources to other Nutrition sites are also provided.

Dietary Guide for Americans 2005 PDF file (4.2MB)

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Diabetes:

American Diabetes Association

This site provides great information on type 1 and type 2 diabetes, gestational diabetes, and pre-diabetes. It provides the signs and symptoms of diabetes and a diabetes risk test. This site is great for diabetes prevention as it provides nutrition and recipes as well as weight loss and exercise information. Information is also available for health professionals and scientists that cover recommendations, research, advocacy, community programs, and meetings. Information is available for children and parents and is also available in Spanish.

Diabetes

A journal of the American Diabetes Association.

National Institute of Diabetes & Digestive & Kidney Diseases

From the National Institutes of Health – this site provides health information and recommendations; information on research and funding; reports, testimony & plans; education programs; participating laboratories and clinical research.

Diabetes Public Health Resource

This site is from the CDC and provides information on conferences, diabetes care and prevention. Information is also available for publications and products as well as statistics and trends – **Diabetes at a Glance**.

Juvenile Diabetes Research Foundation

This site gives updates on juvenile diabetes research, publications and legislative actions. A **Kids Online** resource provides information on living with diabetes.

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Lung Diseases:

American Lung Association

This site has information on Lung Diseases including emphysema, cancer, COPD, asthma, Tuberculosis and many more. Information is also available on environmental factors such as tobacco, air quality and filters, anthrax, and others. The information is also available in Spanish.

National Heart, Lung and Blood Institute (NHLBI) – Lung Diseases Information

This site provides information on several diseases and conditions affecting the Lungs. Information for professionals cover topics such as asthma, information for schools and child care centers, asthma education and prevention, publications, educational tutorials, research, news and events. The site provides publications and fact sheets on asthma, acute respiratory disease syndrome (ARDS), bronchopulmonary dysplasia, pulmonary arterial hypertension, sarcoidosis, and more.

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Health Care for the Elderly:

American Geriatrics Society

A great site for health and aging. This site provides news, education for professionals and patients, funding opportunities, information on guidelines and position statements, geriatrics-for-specialists initiative information, publications, public policy updates, and job information for the elderly. The site also has information on Health Care systems for the elderly.

Life Clinic

Really informative site for elderly care with advice on everything from financial matters to diet and health. The site also provides a "Senior care tracking" link that tracks and records information such as food diaries, exercise, cholesterol and weight. Information for professionals include topics in hypertension, patient pamphlets, web site reviews, free publications, book reviews and news.

Elderly Health Services

A great website with information for health problems of the Elderly, Healthy Lifestyle tips, self-help tips, and career information. This site also has links to publications, videos, resources for providers of Elderly Services, and health education kits. Information also available in Traditional Chinese.

Health and Age

Website on "healthy aging". This website is managed by a group of doctors and provides information for the elderly as well as their caregivers. This site also provides information on news, articles, disease prevention.

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Hypertension & Stroke:

National High Blood Pressure Education Program (NHBPEP) Home Page

* **NHBPEP - Information for Health Professionals**.

This site provides information on heart and vascular diseases, blood diseases, lung diseases and sleep disorders. The site has information for patients, professionals and researchers including clinical practice guidelines for asthma, cholesterol, hypertension, obesity, and other conditions. The site also has information for funding, training, policies, clinical trials, networks and outreach and news and events. Also has information for special audiences: African Americans, Asian Americans and Pacific Islanders, Children/ Parents/Teachers, Latinos, Native American/Alaska Natives, and women.

This site is from the National Heart Lung and Blood Institute (NHLBI)

JNC 7 – The Full Report

JNC 7 Express

JNC 7 - Supplements

JNC 7 Full Report, JNC 7 Express, Blood Pressure Wallet Card, Facts about the DASH eating Plan, 4th Report on high blood pressure in children and adolescents, applications for PALM OS and Pocket PC's, physician reference card, slide show, press release and media kit.

MedlinePlus: High Blood Pressure

This NIH site provides an abundance of resources with links to information on the latest news, disease management, clinical trials, prevention and screening, and research. This complete site also provides links for diagnosis and symptoms, specific conditions, rehabilitation, genetics, organizations, statistics and links to sites for men, women, children, teenagers and seniors.

American Society of Hypertension (ASH)

ASH is the largest U.S. organization dedicated exclusively tot hypertension and related diseases. This site provides guidelines, research, statistics and information on treatments and drugs. The site also gives news, publications, CME activities and the organization provides membership benefits.

International Society on Hypertension in Blacks (ISHIB)

This site has is dedicated to improving the health of ethnic minority populations. It provides information on ethnicity and disease, community outreach, education, CME activities. This site also provides information on guidelines and management of hypertension specific to African Americans, and also has membership benefits.

The American Stroke Association

This site provides information about stroke warning signs, care and programs. It also provides information for conferences, educational resources, scientific advisories and research for clinicians.

MedlinePlus: Stroke

This NIH site provides an abundance of resources with links to information on the latest news, disease management, clinical trials, prevention and screening, and research. This complete site also provides links for diagnosis and symptoms, specific conditions, rehabilitation, genetics, organizations, and statistics.

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Prevention for Migrant/Seasonal Workers:

National Center for Farmworker Health, Inc.

This site provides information for education on migrant health management, including Health Center Management, Midwest Farmworker Stream Forum, Patient Care, Provider Network Resources, and SCHIP and Medicaid Policies. The site also provides network support links to migrant health newsline, farmworker news, job bank and a directory of centers.

New Mexico Governor's Task Force on HIV/AIDS

Position Statement: United States/Mexico Border Health and Migrant/Seasonal Farm Workers. This document gives a background, provides recommendations, additional prevention information and some other useful tips.

U.S. Department of Labor

This site provides rules and regulations for Migrant and Seasonal Workers Protection Act (MSPA)

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Prevention for Latinos:

Delicious Heart Healthy Latino Recipes

From the National Heart Lung and Blood Institute, an informative site with several recommendations for Latinos for heart healthy recipes and meal preparation. This site also contains information in Spanish on blood pressure, cholesterol, smoking, and other related heart issues.

Cookbook PDF - *Platillos Latinos¡Sabrosos y Saludables!*

E recetas latinas, de buen sabor y saludables para el corazón. Estas recetas son las favoritas de las familias de latinos que trabajan en el proyecto Salud para su Corazón.

Medline PLUS – Hispanic American Health

Medline's site for Hispanic health and disease prevention. The site provides links to news, specific conditions, prevention and screening, research, organizations, statistics, women, children, and seniors.

Salud de los hispanoamericanos. Últimas noticias, Condiciones específicas, Nutrición, Asuntos relacionados, Investigaciones, Directorios, Estadísticas, Mujeres, Adolescentes, Información de la enciclopedia médica

Links to Information for Healthcare Providers and Patients

This site has numerous links to sites that provide information on various health issues in Spanish.

Agency for Healthcare Research and Quality (AHRQ)

This site provides a list of consumer materials in Spanish by the Agency for Healthcare Research and Quality (AHRQ). An English equivalent title is under each Spanish title.

*Los siguientes son los títulos de las publicaciones disponibles en español. Estos materiales fueron desarrollados por la Agency for Healthcare Research and Quality. Los títulos aparecen en orden alfabético y están vinculados con las publicaciones. **PDF Ayuda**.*

Latinos and Medicine

Another site that has many informative links for Hispanics and Latinos, including the American Latino Medical Association and The National Network of Latino Medical Students. A huge range of information.

NHLBI, Latino Cardiovascular Health

Salud para su Corazón (For the Health of Your Heart) is an exciting new and comprehensive community-based heart-health promotion initiative from the National Heart, Lung, and Blood Institute. It targets Latinos living in the United States. The project raises awareness of the risk factors and promotes lifestyle changes to reduce the chances of developing heart disease. Salud para su Corazón offers many educational materials in English and Spanish for the general public and community health planners.

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CLINICIAN RESOURCES

Women's Health:

National Women's Health Information Center (NWHIC)

A site from the U.S. Department of Health and Human Services. This site provides information on educational campaigns with special sections on topics such as breastfeeding, body image, heart health, HIV/AIDS, menopause, violence and many more. The site also covers news, research, provides important resources for women and information are available in Spanish and in Chinese.

National Women's Health Resource Center

A site for women with information on health news, health reports, healthy lifestyles, and more. This site has comprehensive information on women's health topics and also provides some information and links to resources in Spanish.

OBGYN.net

This site provides information for medical professionals, medical industry and also global information on women's health issues. The site has various resources for education and symposiums, featured articles and audio and video presentations.

CDC Health Topic – Women's Health

This site provides links to health and safety topics, publication and products, data and statistics, and conferences and events.

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CLINICIAN RESOURCES

Other Prevention Sites:

Put Prevention into Practice (PPIP)

"A program to increase the appropriate use of clinical preventive services, such as screening tests, immunizations, and counseling, based on U.S. Preventive Services Task Force recommendations"

Clinical Preventive Services for Normal-Risk Adults Recommended by the U.S. Preventive Services Task Force

Adult Health Risk Profile

Patient Reminder Postcard

Reference Materials for Clinicians

- Third U.S. Preventive Services Task Force **Recommendations and Rationale**[1]
- **Summaries of the Evidence** for the Third U.S. Preventive Services Task Force[1]
- ***Guide to Clinical Preventive Services***, second edition[1]
- ***Clinician's Handbook of Preventive Services***[1] [2]
- ***Guide to Community Preventive Services*** (coordinated by the Centers for Disease Control and Prevention)

Clinician's Handbook of Preventive Services, 2nd Edition, 1998

Centers for Disease Control and Prevention (CDC)

A leading federal agency for protecting the health and safety of people - at home and abroad. The CDC provides information to enhance health decisions, and promote health through strong partnerships. It serves as the national focus for developing and applying disease prevention and control, environmental health, and health promotion and education activities designed to improve the health of the people of the

United States.

Epocrates – Medical References

Guide to drugs, diseases and diagnoses. Also available for PALM and Pocket PC.

Healthfinder

Health Library

Healthweb

Mayo Clinic

MEDEM

"Medem has created the nation's premier physician-patient communications network, designed to facilitate online access to information and care for more than 90,000 physicians, their practices and their patients, while saving patients time and money and helping physicians generate revenue. Medem's services include HIPAA-compliant *Secure Messaging* and *Online Consultation* (fee-based clinical consultation service), accessed through a customizable practice Web site that includes trusted, award winning clinical content from America's leading medical societies. All services of the Medem Network adhere to the eRisk standards for physician-patient interaction on the Internet, developed by the nation's top professional liability carriers, medical societies, and state boards."

MEDLINEplus

The World's Largest Medical Library from the National Library of Medicine and the National Institutes of Health.

NOAH: New York Online Access to Health

National Library of Medicine (NLM)

National Institutes of Health

NECON

The New England Coalition for Health Promotion and Disease Prevention.

NECON is a coalition of the New England state health departments, the region's schools of public health and federal health agencies led by Region I of the U.S. Department of Health & Human Services, as well as educators, legislators and representatives from industry, labor, and voluntary associations. Its mission is to serve as a vehicle for the development and enhancement of disease prevention and health promotion public policies in New England.

University of North Carolina Center for Health Promotion and Disease Prevention

The Center for Health Promotion and Disease Prevention at the University of North Carolina at Chapel Hill (HPDP), a research center focusing on population health issues, is committed to improving the health of the people of North Carolina and the southeast through interdisciplinary research, teaching and public service. Particular emphasis is paid to the needs of vulnerable and disadvantaged populations.

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Interventions to Improve the Delivery of Preventive Services:

Stange KC, Goodwin MA, Zyzanski SJ, Dietrich AJ. **Sustainability of a practice-individualized preventive service delivery intervention**. *Am J Prev Med.* 2003;25:296-300

Pub Med: ***Abstract***

Stone EG, Morton SC, Hulscher ME, Maglione MA, Roth EA, Grimshaw JM, Mittman BS, Rubenstein LV, Rubenstein LZ, Shekelle PG. **Interventions that increase use of adult immunization and cancer screening services: A meta-analysis.** *Ann Intern Med* 2002;136:641-651

Pub Med: ***Abstract***

Full Text Article

Summaries for Patient

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PATIENT RESOURCES

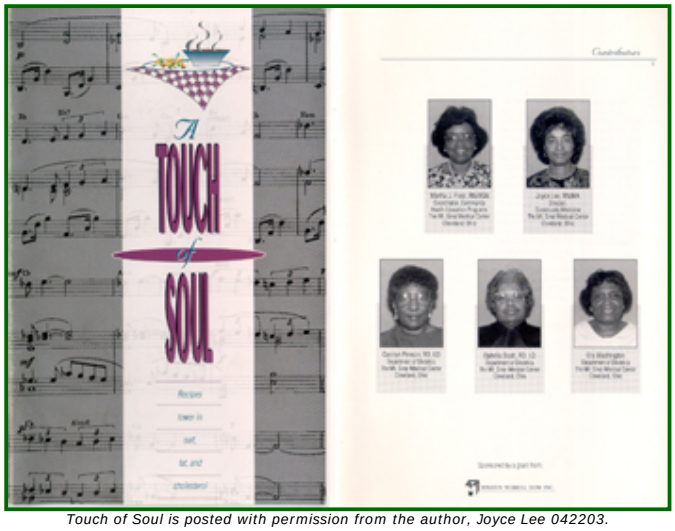
A Touch of Soul:

Click on the image to open a PDF file of this book.
Recipes can be printed from the PDF version.

A TOUCH OF SOUL

Recipes lower in salt, fat, and cholesterol

Martha J. Frost, RN/BSN
Joyce Lee, RN/MA
Carolyn Penson, RD, LD
Ophelia Scott, RD, LD
Ora Washington



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Nutrition & Exercise:

Recipes

Delicious recipes for better health from the American Heart Association

Fitness

From the American Heart Association –Just Move. This fitness center site includes exercise diary, fitness recommendations and other fitness resources.

Health Facts

From the American Heart Association. Health Facts. This site includes a wealth of information on health and fitness:

What is your waist to hip ratio and why is this important

How to find your Body Mass Index (BMI)

Children's need for physical activity

Fitting in Fitness

How to keep track of exercise and diet

Workout Quiz

Healthy Heart Workout Quiz! From the American Heart Association

Diet and Fitness Tools

Tools for diet and fitness from the American Cancer Society. Calculate your BMI, Calculate your daily calorie needs and a Nutrition and Activity Quiz!

Diet and Nutrition

From the Centers for Disease Control and Prevention, this is a "5 A Day" campaign to promote ways to include the required 5 to 9 servings of fruit and vegetables into your mealtime. The site included information for patients including serving size descriptions, fast ways to get your "5 A Day", affordable ways to get your "5 A Day" and recipes.

Healthy Cookbook

Useful, healthy cookbook. General information about well-being and healthy eating. Users have the option to enter preferences, for example low-salt or Italian. Large variety of recipes.

Fat Free Living

Very interesting, “America’s healthiest mom” with information about diet, exercise, and cookbooks. Good for families. Sample recipes available. Worth looking at.

Healthy Recipes and Diet Tips

The magazine *Good Housekeeping’s* online site. Very informative, with more diet tips and good healthy recipes. This site takes the “how to cook healthy for your family” approach.

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Heart Disease, Diabetes & Hypertension:

Shape your Family History Tree
(*login required*)

Shape your family history tree to find out if you are at risk for diabetes and heart disease. (*Login required*). From the American Heart Association

Healthy Heart Tracker
(*login required*)

The Heart Healthy Tracker can be used to log your glucose, cholesterol or blood pressure numbers from any Web browser anywhere, any time. You choose how often to enter your data: every day, once a week or monthly. When it's time for your next medical appointment, print out and take your data and corresponding graphs showing your improvement. (*Login required*). From the American Heart Association.

DASH Eating Plan

The DASH eating plan. Dietary Approaches to Stop Hypertension

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PATIENT RESOURCES

Cancer:

Cancer Prevention Tips

Cancer Prevention. Sun safety, tobacco, and cancer prevention and detection programs. From the American Cancer Society.

Cancer Screening

Exams and test descriptions from the American Cancer Society.

Breast Cancer Quiz

Breast cancer quiz!

Monthly Self Examination

Your monthly breast self examination.

Healthy Diet for Cancer Prevention

An interesting site for cancer patients. It recommends foods and recipes that are beneficial for a cancer patient. Takes a “You are what you eat” approach and applies it here. Also has information on how foods fight toxins and cancer.

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Children and Adolescents:

4 Girls Health

A site by the National Women's Health Information Center, a Division of the Department of Health and Human Services. This site encourages adolescent girls ages 10-16 to choose and adopt healthy behaviors. Information is available on fitness, nutrition, stress management, peer pressure, bullying, suicide, drugs/alcohol/smoking, self-esteem and other topics. Resources are available for parents and caregivers as well as educators. The site is interactive and user friendly and offers free gifts.

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PATIENT RESOURCES

Other Prevention Sites:

NECON

The New England Coalition for Health Promotion and Disease Prevention.

NECON is a coalition of the New England state health departments, the region's schools of public health and federal health agencies led by Region I of the U.S. Department of Health & Human Services, as well as educators, legislators and representatives from industry, labor, and voluntary associations. Its mission is to serve as a vehicle for the development and enhancement of disease prevention and health promotion public policies in New England.

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HYPERTENSION

Secondary Prevention

Measurement of Hypertension

- Measurement should be taken after the patient has been seated quietly for 5 minutes
- During measurement patient should be seated with back supported and arm bared and supported at heart level
- If the patient is >65yrs, has diabetes, or is receiving antihypertensive therapy, first measure after 5 minutes supine, then immediately and upon 2 minutes after standing to check for postural changes.
- The patient should refrain from having any adrenergic stimulant, caffeine or cigarettes 30 minutes prior to measurement
- Cuff size must be appropriate, the bladder should encircle at least 80% of the circumference and cover two-thirds of the length of the arm. A bladder that is too small may give falsely high readings
- Place the bladder over the brachial artery
- Initially take the pressure in both arms and if the pressures differ, use the arm with the higher pressure
- If the arm pressure is elevated, take the pressure in one leg, particularly in patients <30yrs.
- Inflate the bladder quickly to a pressure 20mm Hg above the systolic pressure – recognized by the disappearance of the radial pulse
- Deflate the bladder 3mm Hg
- Record the Korotkoff phase I (appearance) and phase V(disappearance), except in children, for whom use of phase IV (muffling) may be preferable
- If the Korotkoff sounds are weak, have the patient raise the arm and close the hand 5 to 10 times; then inflate the bladder quickly
- Take at least two readings, separated by as much time as is practical. If the readings vary by more than 5 mm Hg, take additional readings until two are close
- For diagnosis obtain at least three readings at least one week apart

White Coat Hypertension[14]

Approximately 80% of patients have higher blood pressure readings in a doctor's office than in a different setting. Twenty to thirty percent of these patients who have elevated readings in a doctor's office, will have normal readings elsewhere. It is

important to distinguish white coat hypertension from high-normal levels with which it is often mistaken since patients with high-normal levels show significant increases in risk of cardiovascular disease and stroke.

Ambulatory Blood Pressure Monitoring (ABPM)[14]

Provides information about BP during daily activities and sleep. Warranted for evaluation of "white coat" hypertension in the absence of target organ injury. Helpful to assess patients with apparent drug resistance, hypotensive symptoms with antihypertensive medications, episodic hypertension, and autonomic dysfunction. Usually lower than clinic readings. Awake individuals with hypertension have an average blood pressure of more than 135/85 mm Hg and during sleep, more than 120/75 mm Hg. ABPM measurement of blood pressure is better correlated with target organ damage than office measurements (JNC 7 & referencing another source, p5).

Self Measurement of Hypertension

Also useful to assess "white coat" hypertension. Home measurement devices should be checked regularly for accuracy.

Headaches and Hypertension[1]

Headaches are commonly reported in hypertensive individuals and it uncertain whether this is a result of more patients with headaches being screened for hypertension.

In many hypertensives the symptoms are describes as:

- band-like headaches
- dizziness and light-headedness
- fatigue
- palpitations
- chest discomfort
- reflect recurrent hyperventilation, this is common among many patients, and likely to be more common among patients who are anxious due to their diagnosis and its implications.

Headaches do become more common with very high blood pressure. "The headache is usually present upon awakening, is felt in the back of the head, may or may not be throbbing in character, and often lasts only a few hours even without analgesic therapy." [1]

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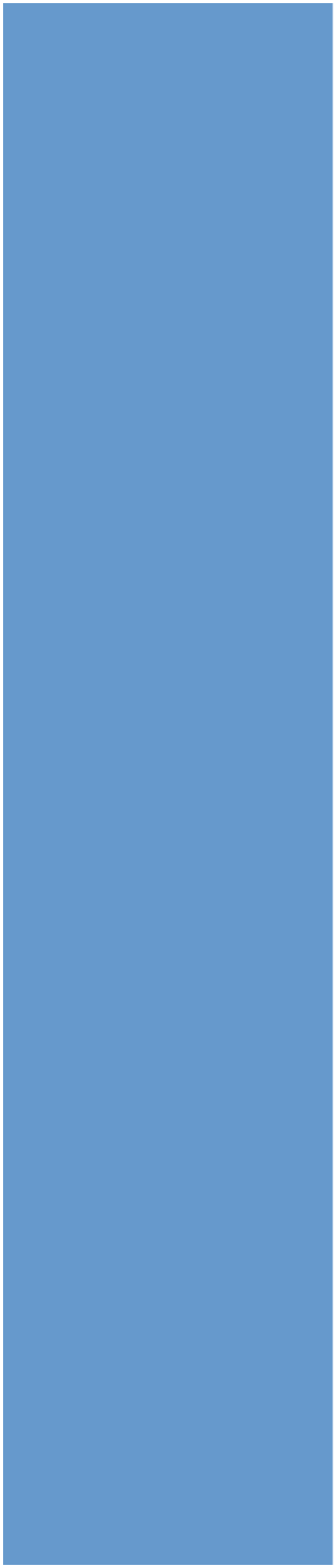

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HYPERTENSION

Primary Prevention

Strategies for Primary Prevention

Effective control of hypertension can be achieved through:

Lifestyle modification

Self-measurement of blood pressure

Managed care in the treatment of hypertension

Antihypertensive medications

Improving adherence to treatment

Hypertension prevention efforts can be effective when targeting the general population and more so when focused on high risk groups. "Lifestyle interventions are likely to be successful and the absolute reduction in risk of hypertension are likely to be greater when targeted in persons who are older and those who have a higher risk of developing hypertension"[7]

"The greatest long-term potential for avoiding hypertension is to apply prevention strategies early in life." [7]

There is convincing evidence that "a nondrug form of treatment could reduce blood pressure (averaging decreases of 11.4/5.5 mm Hg in hypertensive patients and 5.5/3.0 mm Hg in those with borderline blood pressure) as much as some drugs." That hypertension is asymptomatic in many patients and treatment with pharmacologic agents may not have obvious benefits to the patient and may also cause side effects is difficult for patients to accept.[1] Motivation for patients to adopt lifestyle modifications in such cases is important and also serves to reduce the risk of cardiovascular disease.

Interventions with Uncertain or Less Proven Efficacy:

Calcium Supplementation

Fish Oil Supplementation

Herbal or Botanical Dietary Supplements

Primary Prevention of Hypertension: Clinical and

Public Health Advisory from the National High Blood Pressure Education Program.

U.S. Department of Health and Human Services. National Institutes of Health. National Heart, Lung, and Blood Institute.

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HYPERTENSION

Primary Prevention

Benefits of Prevention

- 30 – 40% average stroke reduction
- 20 – 25% average myocardial infarction reduction
- more than 50% average heart failure reduction

“The prevalence of hypertension will increase even further unless broad and effective preventive measures are implemented.”

Lifestyle modification:

Primary prevention

Therapy

In addition to medication treatment for all hypertensive patients

In patients with stage 1 hypertension (SBP 140-159 mm Hg and/or DBP 90-99 mm Hg) and additional cardiovascular risk factors, achieving a sustained 12 mm Hg reduction in SBP over 10 years will prevent 1 death for every 11 patients treated. In the presence of CVD or target organ damage, only 9 patients would require such BP reduction to prevent a death.[9]

- Treatment of hypertension has not been shown to be 100% effective; persons treated with “tight” hypertension control do not reach normotensive levels.
- Even if adequately treated according to current standards, patients with hypertension may not achieve “normal” levels.
- Many persons do not make adequate lifestyle changes or take enough medications to control hypertension.
- A significant portion of cardiovascular disease occurs in people whose blood pressure is above the optimal level (120/80 mm Hg) but not so high as to be diagnosed or treated as hypertension. A population wide approach to lowering of blood pressure can reduce this considerable burden of risk.

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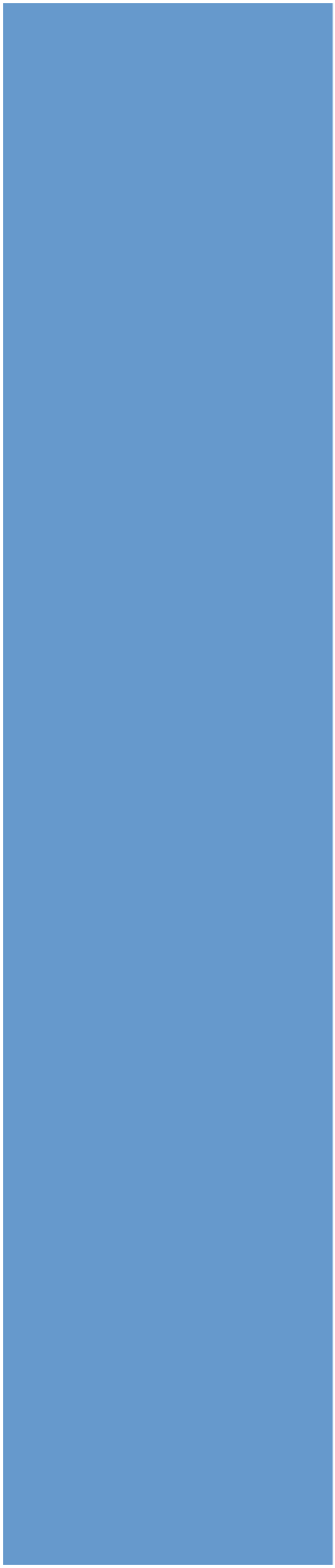

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HYPERTENSION

Primary Prevention

Patient Evaluation

To assess lifestyle and identify other cv risk factors or other concomitant disorders that may affect prognosis and guide treatment.

To reveal identifiable causes of high BP

To assess the presence or absence of target organ damage and CVD

Data needed are acquired through medical history, physical examination, routine laboratory tests and other diagnostic procedures.

Medical History

Known duration and levels of elevation of blood pressure, patient history and symptoms of CHD, heart failure cerebrovascular disease, peripheral vascular disease, renal disease, diabetes mellitus, dyslipidemia, sexual dysfunction, family history of hypertension CHD, stroke, diabetes, dyslipidemia, or renal disease,; history of recent changes in weight, leisure time physical activities, smoking and tobacco use, dietary: intake of sodium, alcohol, saturated fat, caffeine. History of all prescribed and OTC meds, herbal remedies and illicit drugs, - some may interact with antihypertensive drugs. Results and adverse effects of previous antihypertensive therapy, psychosocial and environmental factors, (family situation, employment status and working conditions, educational level) that may influence hypertension control.

Physical Examination

Measurement of BP with verification in the contralateral arm. Examination of the ortic fundi. Calculation of BMI. Auscultation for carotid, abdominal, and femoral bruitis. Palpation of the thyroid gland. Thorough examination of the heart and lungs. Examination of the abdomen for enlarged kidneys, masses, and abnormal aortic pulsation. Palpation of the lower extremities for edema and pulses. Neurological assessment.

Laboratory Test and Other Diagnostic Procedures

Routine: electrocardiogram. Urinalysis. Blood glucose. Hematocrit. Serum potassium, creatinine (or the corresponding estimated glomerular filtration rate [GFR] and calcium. Lipid profile, including high-density lipoprotein, low-density lipoprotein cholesterol and triglycerides, after 9 – 12 hour fast. Optional tests include measurement of urinary albumin excretion or albumin/creatinine ratio.

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HYPERTENSION

Secondary Prevention

The early detection and treatment of hypertension has major implications prevention of heart disease and stroke, two of the three leading causes of death in the United States.

Screening for Hypertension

Blood pressure measurement and clinical evaluation recommended by the **JNC VI**:

- Average of 2 or more blood pressure readings, at each of two or more visits after an initial screening visit.
- When SBP and DBP fall into different categories, the higher category should be selected to classify the individual's blood pressure.
- Blood pressure reading should be according to guidelines: see JNC VI guidelines. (**see classifications**)
- Self measurement – several benefits.
    - Eliminates the white coat effect.
    - Assess response to antihypertensive meds
    - Improves patient adherence to treatment
    - Cost conservative
- Choice of monitors for personal use – valid electronic device or ambulatory pressure monitoring devices

Patient Evaluation:

1. To assess lifestyle and identify other cardiovascular risk factors or concomitant disorders that may affect prognosis
2. To reveal identifiable causes of high BP
3. To assess the presence of absence of target organ damage and CVD

Medical History:

Known duration and levels of elevation of blood pressure, patient history and

symptoms of CHD, heart failure cerebrovascular disease, peripheral vascular disease, renal disease, diabetes mellitus, dyslipidemia, sexual dysfunction, family history of hypertension CHD, stroke, diabetes, dyslipidemia, or renal disease,; history of recent changes in weight, leisure time physical activities, smoking and tobacco use, dietary: intake of sodium, alcohol, saturated fat, caffeine. History of all prescribed and OTC meds, herbal remedies and illicit drugs, - some may interact with antihypertensive drugs. Results and adverse effects of previous antihypertensive therapy, psychosocial and environmental factors, (family situation, employment status and working conditions, educational level) that may influence hypertension control.

Physical Examination:

Measurement of BP with verification in the contralateral arm. Examination of the optic fundi. Calculation of **BMI**. Auscultation for carotid, abdominal, and femoral bruitis. Palpation of the thyroid gland. Thorough examination of the heart and lungs. Examination of the abdomen for enlarged kidneys, masses, and abnormal aortic pulsation. Palpation of the lower extremities for edema and pulses. Neurological assessment.

Laboratory Test and Other Diagnostic Procedures:

Routine: electrocardiogram. Urinalysis. Blood glucose. Hematocrit. Serum potassium, creatinine (or the corresponding estimated glomerular filtration rate [GFR] and calcium. Lipid profile, including high-density lipoprotein, low-density lipoprotein cholesterol and triglycerides, after 9 – 12 hour fast. Optional tests include measurement of urinary albumin excretion or albumin/creatinine ratio.

Identifiable Causes of Hypertension

Genetics

Genetics plays a major role in the development of hypertension. Children of hypertensives are twice as likely to develop hypertension.

Salt Sensitivity

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HYPERTENSION

Secondary Prevention

Secondary Prevention and Treatment

Secondary Prevention: Management of Hypertension

- Newly developed cases of hypertension should be evaluated to determine the type of hypertension, impact on target organs, and to estimate the overall risk of developing premature cardiovascular disease.
- Secondary causes should be aggressively sought especially in younger patients with high levels.
- Cardiovascular risk profile should be determined for middle-aged and older persons since this population is at greater risk for immediate catastrophes.

JNC VI recommends starting pharmacologic therapy with diuretics and β blockers for patients with uncomplicated hypertension.

- Prevention of hypertension and complications achieved by: introduction of new combination antihypertensive medications and angiotensin II receptor blockers, strategies for improving adherence to treatment.
- Pharmacologic therapy and diuretics and β blockers for patients with uncomplicated hypertension
- Pharmacologic treatment depending on:
    - Degree of blood pressure elevation
    - Presence of target organ damage
    - Presence of clinical cv disease and or other risk factors
    - Demographic characteristics
    - Concomitant diseases and therapies
    - Quality of life
    - Physiology of biochemical measurements
    - Cost
    - Managed care
    - Drug interactions
- Provides protection for stroke coronary events heart failure progression of renal disease progression of more severe hypertension and all cause mortality- this

especially pertains to the elderly

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HYPERTENSION

Secondary Prevention

JNC-VI Treatment Recommendations for High Risk Hypertensives

Hypertensive patients who meet the criteria for inclusion in Risk Group C--defined by JNC-VI, because they have diabetes and/or evidence of target organ damage (TOD) or clinical cardiovascular disease (CCD), with or without other cardiovascular or renal risk factors--are candidates for initial drug therapy, even if their systolic and/or diastolic blood pressure elevation falls into the range considered high normal or mildly elevated (Stage I).

Reference:
The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. Arch Intern Med. 1997;157 (21):2413-2446.

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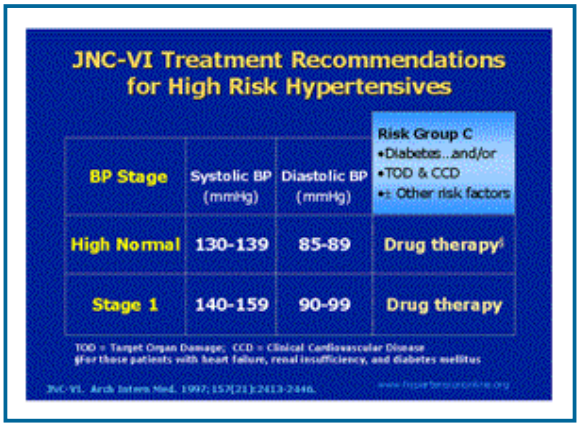

Treatment of High Risk Hypertensives

Current recommendations in the National Kidney Foundation Hypertension and Diabetes Executive Committees' consensus report are that patients who are classified as Risk Group C, as defined by the JNC-VI report, should have their hypertension treated to a goal blood pressure of less then 130/85 mmHg. Recommendations in the National Kidney Foundation Hypertension and Diabetes Executive Committees' consensus report are that diabetic patients with proteinuria of > 1 gm/24 hours, regardless of their blood pressure, should be treated with anti-hypertensive agents to lower their blood pressure to values less than 125/75 mmHg. Based on the experience gained in several controlled clinical trials that included patients who met the criteria for one of the two categories defined above, the approximate number of anti-hypertensive drugs required to achieve these goal blood pressures was 2-3 for patients in Risk Group C, and 3-4 for diabetics with > 1mg/day of proteinuria.

Reference:

Bakris GL, Williams M, Dworkin L, Elliott WJ, Epstein M, Toto R, Tuttle K, Douglas J, Hsueh W, Sowers J. Preserving renal function in adults with hypertension and diabetes: a consensus approach. National Kidney Foundation Hypertension and Diabetes Executive Committees Working Group. Am J Kidney Dis. 2000;36(3):646-661.

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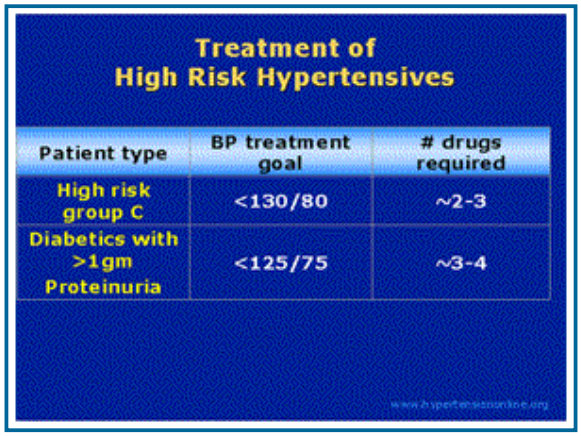

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HYPERTENSION

Secondary Prevention

Benefits of Lowering Blood Pressure

In clinical trials referenced by JNC 7, antihypertensive therapy has been associated with the following results:

- Reductions in stroke incidence averaging 35 to 40 percent
- Reductions in myocardial infarctions averaging 20 – 25 percent
- Reductions in heart failure of more than 50 percent

In patients with stage 1 hypertension (SBP 140-159 mm Hg and/or DBP 90-99 mm Hg) and additional cardiovascular risk factors, achieving a sustained 12 mm Hg reduction in SBP over 10 years will prevent 1 death for every 11 patients treated. In the presence of CVD or target organ damage, only 9 patients would require such BP reduction to prevent a death.

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HYPERTENSION

The Science Base for Disease Prevention

FACTS ABOUT ***The DASH Eating Plan***

Dietary Approaches to Stop Hypertension (DASH)

- The DASH study involved 459 individuals with systolic blood pressures of less than 160 mm Hg and diastolic pressures of 80 -95 mm Hg. About 27 percent of the participants had hypertension. About 50 percent were women and 60 percent were African Americans.

- DASH compared three eating plans: A plan similar in nutrients to what many Americans consume; a plan similar to what Americans consume but higher in fruits and vegetables; and the DASH eating plan. All three plans included about 3,000 [mg] of sodium daily. None of the plans was vegetarian or used specialty foods.

- Results were dramatic: Both the fruits and vegetables plan and the DASH eating plan reduced blood pressure. But the DASH eating plan had the greatest effect, especially for those with high blood pressure. Furthermore, the blood pressure reduction came fast – within 2 weeks of starting the plan.

DASH (Dietary Approaches to Stop Hypertension) diet is effective treatment for stage 1 isolated systolic hypertension

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Classification and Management of Blood Pressure for Adults*

BP Classification	SBP* mm Hg	DBP* mm Hg	Lifestyle Modification	Initial Drug Therapy	
				Without Compelling Indication	With Compelling Indications (See Table 8)
Normal	<120	and <80	Encourage	No antihypertensive drug indicated.	Drugs for compelling indications.†
Prehypertension	120-139	or 80-89	Yes		
Stage I Hypertension	140-159	or 90-99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination	Drug(s) for the compelling indications.‡ Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.
Stage 2 Hypertension	≥160	or ≥100	Yes	Two-drug comcbination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB)	

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Introduction

While the recent surge of interest in women's cardiovascular health has led to a number of important advances in gender-specific research, the data still remain sparse. For instance, a 2003 systematic review of research on CHD in women found that only 20% of the articles reviewed (162 out of 810) provided information specific to women. Of 42 key questions that were posed by the investigators regarding diagnosis and management of CHD in women, only 6 could be answered with the available literature, with no data at all to address 13 of the basic questions[5]. Clearly, further progress in gender-specific research is necessary in order to develop a reliable evidence-based framework to identify, manage and prevent heart disease in women. Indeed, the paucity of evidence for the treatment of women has alerted the National Institutes of Health to issue a mandate that women must be included in all clinical research. This is a feature that has now become a key element of the scientific review process.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Introduction

KEYPOINTS

The need for a gender-specific approach is underscored by the numerous differences of CVD in men and women. While we will explore these features in detail in the subsequent sections, some of the key points will are summarized here:

**Women tend to present later in life with manifestations of cardiovascular disease, likely a reflection of the cardio-protective pre-menopausal state. This has important implications as older age confers more co-morbidities, which may affect treatment options as well as the overall prognosis for such patients.

**Conventional diagnostic tests may not be as accurate in women, obscuring the diagnosis of CVD.

**The risk factor profile of women with CVD is dissimilar to that of men. Women tend to have higher total cholesterol in all age groups than men but have greater amounts of cardio-protective high density lipoprotein- cholesterol, are more likely to be physically inactive, with greater resulting obesity, especially prevalent in African-American women. Higher rates of diabetes than men are seen in certain subgroups of women, especially Mexican and African-American females[1].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Introduction

KEYPOINTS (continued—)

**Presenting symptoms of CVD may be atypical in women. For example, in women presenting with myocardial infarction, few experienced chest discomfort, the hallmark symptom in men. More frequently, shortness of breath, fatigue and weakness were observed to be acute symptoms[2]. Moreover, doctors as well as patients tend to misinterpret cardiac chest pain in women as being non-cardiac in origin, often missing the diagnosis. This finding underscores the importance that health care providers be knowledgeable about and attuned to unusual presentations of CVD in women.

**In some cases, women are more likely to experience worse prognosis from CVD than men. Within 6 years of an MI, women are more likely (35% vs. 18%) to experience a recurrent myocardial infarction than their male counterparts, more than twice as likely (46% vs. 22%) to experience disability from heart failure and are at higher risk (11% vs. 8%) of experiencing stroke than men. Additionally, 38% of women, compared to 25% of men are likely to die in the subsequent year after an initial MI[1].

**CVD during pregnancy continues to be an issue of particular concern for women.

**The association between hormone replacement therapy and cardiovascular disease is a topic of concern for postmenopausal women and has received much attention over the past decade. As discussed in the sections following, findings from the Womens' Health Initiative fail to confirm a beneficial role for hormonal therapy in promoting cardiovascular health in women.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Morbidity and Mortality

CHD:

CHD is the leading cause of permanent disability in the US labor force.

In 2001, nearly 8 million people had experienced an MI. Of these, 3,000,000, or 2.1% of the general population were women. 345,000 women suffered a new or recurrent nonfatal MI in 2001, with the number increasing to 485,000 when those with fatal CHD were included. Prognosis for women is poor; 38% of women, compared with 25% of men die in the year following an initial MI.

In the 6 years following an initial MI:

- Twice as many women as men are at risk of recurrent MI
- 46% of women, compared to 22% of men will be disabled with heart failure
- Women are at higher risk of experiencing stroke then men, with 11% compared to 8%
- More women are likely to experience angina pectoris than men, with 4.3% of all females and 2.7% of men suffering from angina[1].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Morbidity and Mortality

Stroke:

25% of women, compared to 22% of men die within a year from an initial stroke episode.

15-30% of people who experience stroke are permanently disabled and 20% require institutional care after stroke[1].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Diagnosis

Noninvasive Diagnostic Tests: (continued—)

The need for pharmacologic stress testing in women with CAD may be higher as they tend to be older upon presentation and may have co-morbidities that prevent them from exercising to the target heart rate. Adenosine or dipyridamole technetium sestamibi with gated SPECT testing are appropriate for use in women for the detection of CAD and offer higher sensitivity than when used with echocardiography. Dobutamine echocardiography may be a more valuable test in the setting of left ventricular hypertrophy[9]. These imaging tests may also be useful in a subset of women who continue to experience angina despite angiographically normal coronaries. As demonstrated in the WISE study (Women's Ischemia Syndrome Evaluation), these are women who are thought to have an abnormal flow reserve or silent myocardial ischemia. MR spectroscopy may be more useful in detecting disease in these women[13].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Diagnosis

Invasive Diagnostic Testing – A General Approach for Women:

1. Proceed directly to angiography if there is a high pre-test probability of CAD; ex: older women with typical angina

2. For women <50 yrs with typical chest pain and normal resting ECG, exercise ECG is a reasonable and cost-effective initial test

3. In young women with non-specific symptoms and low pre-test probability of CAD, stress testing is likely to be unrevealing

4. In women with abnormal resting ECGs, consider stress echocardiography for better accuracy.

5. For women unable to exercise, pharmacologic stress testing is appropriate[9].

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

In December 2003, a collaborative effort by several members of the American Heart Association resulted in the first ever set of evidence-based guidelines for the prevention of cardiovascular disease in women. This was a landmark endeavor that entailed systematically sorting through thousands of previously published articles and AHA recommendations for CVD with the goal of deriving applicable data for the prevention of cardiovascular disease in women. This data was compiled into a set of prevention strategies based on the Framingham risk stratification system (**Framingham Risk Score Calculator**). The score classifies women into optimal, low, intermediate and high risk categories, reflecting their 10-year CHD risk. Subsequently, one can tailor patients' disease prevention recommendations based on their risk category.

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

Recommendations for High-Risk Women (continued—)

- Blood Pressure control: Optimal BP is 120/80. Start with lifestyle approaches, but pharmacotherapy is indicated when BP > 140/90 or in the presence of target organ damage or diabetes. Thiazides are generally first line drugs, unless contraindicated
- Lipid control/statin therapy: Limit saturated fat to <7% of total calories, cholesterol <200 mg/day. Reduce trans-fatty acid intake. Initiate statin therapy along with lifestyle therapy in high-risk women with LDL-C>100 mg/dl or <100 mg/dl unless contraindicated. Initiate niacin or fibrate therapy if HDL-C is low (<40 mg/dl) or non-HDL-C is elevated in these high-risk women

Optimal levels of lipids in women are:

LDL-C <100 mg/dl

HDL-C > 50 mg/dl

Triglycerides <150 mg/dl

Non-HDL cholesterol <130 mg/dl

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PREVENTION – WOMENS' CARDIOVASCULAR HEALTH

Prevention of Cardiovascular Disease in Women

Recommendations for High-Risk Women (continued—)

- Aspirin therapy: 75-162 mg/day. If patient is intolerant to aspirin, clopidogrel can be substituted
- Beta Blocker therapy: These should be used indefinitely in women who have had a myocardial infarction or chronic ischemic syndromes unless contraindicated
- ACE Inhibitor Therapy: Use ACE-I in high-risk women unless contraindicated. Use Angiotensin Receptor Blockers (ARBs) in high-risk women with EF<40% or among those with clinical evidence of heart failure who are intolerant of beta-blockers
- Glycemic control in diabetics: Lifestyle and pharmacotherapy should be used to achieve HgBA1C < 7%
- Class IIa recommendation: (Weight of evidence/opinion is in favor of usefulness/ efficacy)
- Evaluate/treat for depression
- Class IIb recommendation: (Usefulness/efficacy is less well established by evidence/opinion)
- Omega-3 fatty acid supplementation: may be considered as an adjunct to diet in high-risk women.
- Folic Acid supplementation: may be considered as an adjunct to diet in high-risk women (except after revascularization procedure) if a higher than normal homocysteine level is detected

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Breast Cancer

Epidemiology

Prevalence

- The prevalence of breast cancer in the US is estimated at 0.6-1.0% of the general population undergoing screening.

Incidence

- In the US, a woman's probability of developing breast cancer in her lifetime is 1 in 7.
- Incidence of female breast cancer is age-specific, with increasing incidence rates peaking between 75-79 years.
- From 1996-2000, women ages 75 to 79 years had the highest incidence rate, 499 cases per 100,000 population, while women between the ages of 20-24 had the lowest incidence rate, 1.4 cases per 100,000 population.
- From 1996 to 2000, 94% of new breast cancer cases and 96% of breast cancer deaths occurred in women ages 40 and older.
- Estimates for total new breast cancer cases in the US for 2003 are 267,000, with 55,700 insitu cases, and 211,300 invasive cases.
- The incidence rates of invasive breast cancer over the last 30 years have demonstrated three distinct phases. From 1973 to 1980 incidence was essentially constant. Incidence increased by almost 4% per year between 1980 and 1987. This increase is attributed to the increased use of mammography screening and the subsequent detection of nonpalpable cancers. Rates between 1987 and 2000 increased by approximately 0.4% per year. Total increasing trends over this 30 year period are attributed to changes in reproductive patterns, including having fewer children and delaying childbearing.

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Breast Cancer

Epidemiology

Risk Factors

- **Gender:** Gender is the main risk factor for developing breast cancer, with less than 1% of all breast cancers occurring in men.
- **Age:** Among women, age is the most significant risk factor, with increasing incidence and mortality with age. Seventy-seven percent of women with breast cancer are older than 50 years of age when they are diagnosed.
- **Race:**
  - Whites have a greater incidence of breast cancer than African Americans after age 40 years. However, before age 40, this trend is reversed.
  - Asian, Hispanic, and Native American women have a lower risk of developing breast cancer.
  - Women of Ashkenazi Jewish descent have a higher risk than whites of developing breast cancer. **Cancer Spectrum: Warner et al., pp. 1241-1247.**

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Breast Cancer

Epidemiology

Risk Factors *(continued—)*

- **Family History:** Women having first-degree relatives (mother, sister) with breast cancer have a greater risk of developing breast cancer themselves. Relative risks increase from 2.1 to 4 with one first degree relative and greater than 4 times the relative risk with two first-degree relatives. The risk is even greater if the relatives developed breast cancer before the age of 40 years or had bilateral breast cancer.
  - Inherited mutations, such as BRCA1 and BRCA2, account for approximately 5% to 10% of breast cancer cases. BRCA1 mutations are present in approximately 0.1% of the general population, compared with 20% of the Ashkenazi Jewish population. Women with a BRCA1 or a BRCA2 mutation have up to an 85% lifetime risk of developing breast cancer.
  - Scientists believe that the occurrence of most breast cancer in families is due to similar lifestyles and low-risk variations in genetic susceptibility.

- **History of Other Cancers or Pathology:**
  - Women with a history of breast cancer have a four-fold risk increase of developing a new breast cancer in the same or opposite breast (not recurrence).
  - Women with a history of ovarian, endometrial or colon cancer are at increased risk of developing breast cancer, up to 2 times the relative risk.
  - A previous biopsy of the breast indicating ***atypical hyperplasia*** increases a woman's risk of developing breast cancer by 4 to 5 times.

- **Years of Menstruation:** Any factors that increase the number of menstrual cycles in a woman's lifetime increase a woman's risk of developing breast cancer. This increase in risk is associated with increased lifetime exposure to estrogen.
  - Nulliparity
  - Fewer number of pregnancies
  - First full-term pregnancy after 30 years of age
  - Never breast fed

- Menarche beginning at below 12 years of age
- Menopause occurring at above 55 years of age

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Breast Cancer

Epidemiology

Risk Factors *(continued—)*

- **Exogenous and Lifestyle-Related Factors-Opportunity for Primary Prevention:** Other factors that demonstrate an effect on relative risk of women developing breast cancer include; hormone replacement therapy, oral contraceptive use, obesity, alcohol consumption, low physical activity, irradiation of the chest. These factors may be modifiable and present an opportunity for the patient and physician to minimize a woman's individual risk of developing breast cancer.

  - **HRT:** The Women's Health Initiative has reported an increased risk of breast cancer related to the use of combined HRT (estrogen and progesterone). Not only was breast cancer risk increased, but the study also determined that breast cancer was also diagnosed at a more advanced stage. A woman's relative risk for developing breast cancer is 1.35 after 10 years of HRT use. Risk seems to return to that of the general population 5 years after discontinuing HRT. **Collaborative Group on Hormonal Factors in Breast Cancer**

  - **Oral Contraceptives:** Recent use of oral contraceptives may slightly increase a woman's risk of developing breast cancer. However, women who have not used oral contraceptives for more than 10 years, have the same risk as women who have never used oral contraceptives. **Oral Contraceptive and Reproductive System Cancer**

  - **Obesity:** It is believed that adipose tissue promotes androgen to estrogen conversion, increasing a woman's overall lifetime exposure to estrogens. An American Cancer Society study demonstrated that overweight women are 60% more likely to die from breast cancer when compared to normal weight women. The increased risk of breast cancer appears to be linked to postmenopausal obesity. **ACS :: Major New American Cancer Society Study Links Obesity to Increased Cancer Death Risk**

  - **Physical Activity:** The effect of physical activity on the risk of developing breast cancer is a relatively new area of research. Studies indicate that strenuous exercise during a woman's youth may provide life-long protection, while moderate to strenuous activity as an adult may lower breast cancer risk. **Lifetime Physical Activity and Breast Cancer Risk**

  - **Alcohol Consumption:** American Cancer Society reports that 2 drinks per day (24g of alcohol) may increase breast cancer risk by approximately 21%. The exact mechanism is unknown. Alcohol may increase estrogen and androgen levels in the body or it may induce genome instability leading to chromosomal abnormalities that increase

breast cancer risk. **Alcohol, Genome Instability and Breast Cancer**

- **Socioeconomic Status:** Women with higher socioeconomic level appear to have a higher risk of developing breast cancer, after controlling for other identifiable risk factors, than women in lower socioeconomic groups. It remains unclear why this disparity exits. **Socioeconomic Risk Factors for Breast Cancer**

- **Radiation to the Chest:** The American Cancer Society reports that women who receive high-dose radiation to the chest for the treatment of lymphoma have a 2.1 to 4.0 relative risk of developing breast cancer. Studies looking at the effect of mantle field radiation therapy support these findings. **Breast Cancer and Mantle Field Radiation**

- **Clinical Assessment Tool:** National Surgical Adjuvant Breast and Bowel Project (NSABP) and the National Cancer Institute (NCI) have developed a computer program to help women and their health care providers estimate the risk of developing breast cancer based on a number of risk factors. **Breast Cancer Risk Assessment Tool**

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Breast Cancer

Epidemiology

Morbidity *and* ***Mortality***

- It is estimated that 40,580 people will die of breast cancer in 2004. Published mortality rates for 2001 were 26 per 100,000 population across all age groups. Younger age groups had lower death rates, while older groups had higher rates. **2001 US Death Rates from Breast Cancer**

- The American Cancer Society reports that death rates from breast cancer in all races have declined in recent years. Between 1975 and 1990, death rates were increasing by 0.4% annually. However, between 1990 and 2000, mortality rates decreased by 2.3% annually. The decrease in death rates from 1990 to 2000 was more pronounced within younger age groups, with a decrease of 3.7% per year in women less than 50 years of age. This decline in mortality is attributed to increased breast cancer detection and improved breast cancer treatment.

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Breast Cancer

Epidemiology

Morbidity *and* ***Mortality*** *(continued—)*

- Several factors seem to influence survival rates of women diagnosed with breast cancer. These include; time since diagnosis, age at diagnosis, stage at diagnosis, and race/ethnicity/socioeconomic factors.
  - **Time Since Diagnosis:** Relative survival rates for women diagnosed with breast cancer are the following.
    - 87% at 5 years
    - 77% at 10 years
    - 63 % at 15years
    - 52% at 20 years

  For women who have already survived 5 years, the 5-year relative survival rate increases to 81% for white women and 76% for African American women. Five-year relative survival rates for women who have already survived 10 years increases to 87% and 85% for white and African American women, respectively.

  - **Age at Diagnosis:** Women over the age of 45 years have 5-year relative survival rates that increase with age. Women under the age of 45 have a lower rate, possibly due to more aggressive and less responsive tumors in this age group. The following are the 5-year relative survival rates based on age at diagnosis:

Age	5-Year Survival Rate
<45	83%
45-54	87%
55-64	88%
65-74	89%
75 or over	86%

  - **Race / Ethnicity / Socioeconomic Factors:** Some disparity exists in death rates between whites, Hispanics, and African Americans. Between 1990 and 2000, the overall mortality rates declined for whites by 2.6% per year, while a 1.4% decline in deaths was seen in Hispanics and 1.1% decline in African American women. Five-year survival rates for African American women versus white women from 1995 to 2000 were 75.2% versus 88.9%, respectively. Even after

adjustment for socioeconomic variables, this discrepancy still exists. Additionally, women with lower incomes are more likely to be diagnosed with an advanced stage of breast cancer and have a lower 5-year survival rates than women with higher incomes. These differences may be linked to unequal access to medical care, disparities in treatment, and the presence of comorbid conditions.

Race and Differences in Breast Cancer Survival in a Managed Care Population

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Breast Cancer

Epidemiology

Screening for Breast Cancer

Screening for breast cancer has been a controversial topic and the subject of various international and national studies and trials. Both the American Cancer Society and the U.S. Preventive Services Task Force (USPSTF) have put forth recommendations and criteria for the types of screening, age at screening onset, and frequency of screening. These recommendations are based on data supporting the reduction of breast cancer mortality with implementation of these screening methods. A summary of the screening trials, along with a critical appraisal of their methodologies, was published in the Annals of Internal Medicine.

Breast Cancer Screening: A Summary of the Evidence for the U.S. Preventive Services Task Force — Humphrey et al. 137 (5): 347 — Annals of Internal Medicine

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Breast Cancer

Epidemiology

Screening for Breast Cancer
(continued—)

- **Breast Self-Exam (BSE):** The BSE is a screening modality that may be done by women over 20 years of age on their own breasts. However, in a limited number of trials, it has been demonstrated that mortality rates were similar regardless of whether women performed a monthly BSE or not. The American Cancer Society discontinued its recommendation in 2003 that women perform monthly BSE and has made the screening optional. The USPSTF does not recommend for or against teaching or performing routine BSE. However, numerous patient resources still advocate the use of BSE and advise women to perform this exam once a month, looking for breast lumps, asymmetry, and skin changes. If a patient wishes to perform monthly BSE, the clinician may instruct on the proper technique and changes to look for.

  Self Breast Exam

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Breast Cancer

Epidemiology

Screening for Breast Cancer
(continued—)

- **Clinical Breast Exam (CBE):** The CBE is performed by a trained health care professional. During this exam, the examiner performs a physical inspection of the breasts, looking for dimpling, asymmetry, skin changes or tethering. This is followed by palpation of the breast tissue, axilla, and supraclavicular lymph nodes. Sensitivity for this exam ranges from 40% to 69%, with a specificity of 88% to 99%. False positive results are higher among women younger than 50 years old, which may be due to increased breast density of these women. It has been demonstrated that CBE, in combination with mammography, decreases mortality rates. However, no screening trial has examined the benefits of CBE alone, without accompanying mammography, versus no screening.

  Mammography Versus Clinical Examination of the Breasts

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CHILDHOOD IMMUNIZATIONS

Introduction

Vaccine-Preventable Diseases

The Centers for Disease Control and Prevention (CDC) provide health care professionals with a quick reference vaccines chart that is available online. This chart provides links to specific information about each disease, vaccination contraindications and precautions, vaccine side effects, vaccine information sheets for parents, and current vaccine research and publications.

CDC Quick Reference Vaccines Chart

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CHILDHOOD IMMUNIZATIONS

Epidemiology

Decline in Morbidity

Reducing the incidence of vaccine-preventable diseases relies on having effective vaccines and high immunization rates in the community. An effective vaccine not only protects the individual from illness, but also decreases the likelihood of the disease spreading. Having a high level of immunity in the community, also known as "herd immunity", breaks the chain of transmission and also serves to protect those who are not immunized or did not respond to the vaccine. Efficacy rates of vaccines range from 85% to 100% after appropriate dosing in children. The efficacy rate for pertussis is somewhat lower, at 62% to 92%[2].

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CHILDHOOD IMMUNIZATIONS

Epidemiology

Immunization Rates

Having high immunization coverage in the community helps to stop the spread of vaccine-preventable diseases. Healthy People 2010 has identified increasing immunization rates as one of the leading health concerns for the nation.

Immunization – Leading Health Indicator.

Its target goal for 2010 is that 90% of children have received the recommended immunizations for the first two years of life. The 90% vaccination coverage level is considered sufficient to interrupt the spread of vaccine-preventable diseases[1].

Vaccine coverage rates are monitored annually by the National Immunization Survey (NIS) of the Center for Disease Control and Prevention, which conducts a telephone survey of U.S. homes with children aged 19-35 months. The survey results are verified by accessing the health care provider records of these children. In 2002, about 75% of children in this age group had received the combined series of 4 doses of DTaP (diphtheria, tetanus, pertussis) vaccine, 3 doses of polio vaccine, at least one dose of MMR (measles, mumps, rubella), 3 doses of Hib (*H. influenzae* type B) vaccine, and 3 doses of Hepatitis B vaccine. The NIS found higher rates of coverage when surveying for individual vaccines. For example, in 2002 it found that about 82% of children had received 4 doses of DTaP vaccine and about 90% had received 3 doses of polio vaccine. However, the coverage rates where much lower for the combined recommended series of vaccinations, falling substantially below the 90% target[4].

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CHILDHOOD IMMUNIZATIONS

Factors Impacting Vaccine Coverage Rates

Cost Burden

Vaccines are not only effective in reducing morbidity and mortality, but also are a cost-effective way to positively impact public health. It has been estimated that for every dollar spent on vaccinations, $10 to $14 will be saved in future health care costs[2]. Minimizing out-of-pocket expenses for families can enhance access to vaccination services. For example, a health insurance plan should cover the cost of childhood immunizations. Free vaccines are available for children whose insurance does not cover vaccinations, or for those who are uninsured[5]. Funding for free vaccinations is provided by the Vaccines for Children Program, Public Health Service Section 317 grants to states, and various state or local programs[6].

Children who are residents of Cuyahoga County, Ohio may receive immunizations at low cost at various immunization clinics. Certain municipalities within Cuyahoga Country maintain their own health department and provide immunization services. Information on each of these clinics may be accessed below:

Cuyahoga County District Board of Health

City of Cleveland

City of Shaker Heights

City of Lakewood

The Vaccines for Children Program (VFC) is a federally funded program which provides vaccinations to eligible children at no cost. Eligible children include the uninsured, Medicaid recipients, Native Americans and Alaska Natives. Children can also qualify for the Program if their health insurance does not cover immunizations. Prior to the institution of VFC, uninsured or underinsured children were referred to public health department clinics for vaccinations. Children can now receive vaccinations as part of routine care with their own health care provider, regardless of insurance status. Health care providers need to enroll in the VFC program in order to provide this service to their patients. In 2002, VFC provided vaccinations to about 41% of children in the United States[7].

Click here for more information on the VFC program.

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CHILDHOOD IMMUNIZATIONS

Factors Impacting Vaccine Coverage Rates

Socioeconomic Status

One of the major goals of Healthy People 2010 is to eliminate disparities in receiving health care, including childhood immunizations[1]. Nationally, the most pervasive barrier to receiving immunizations is low socioeconomic status. Data from 1996 to 1999 showed an improving trend in vaccination coverage rates for all socioeconomic groups. However, when comparing vaccination coverage rates in children above and below the poverty level, children living above the poverty level consistently have higher rates than those below the poverty level[3].

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CHILDHOOD IMMUNIZATIONS

Factors Impacting Vaccine Coverage Rates

Access to Health Care

Healthy People 2010 has also identified increasing access to health care as another goal. One indicator of increasing access would be universal health insurance coverage. In 1997, 83% of the population under the age of 65 years had some sort of health insurance. This translates to more than 44 million people without coverage, with 11 million of them being children. The 2010 target for health insurance coverage is 100%. Another indicator is increasing the number of people having a regular primary care provider, sometimes know as having a "medical home". In 1998, 87% of the population had a primary care provider, with more than 40 million not having a medical home. The 2010 target is to increase the number of people having a regular primary care provider to 96%.

Access to Health Care – Leading Health Indicator

Children without a regular primary care provider may receive immunizations at more than one location. Often there is no communication between multiple providers regarding immunizations given, resulting in record scattering. Assessing a child's vaccination status becomes difficult, and can result in either unnecessary vaccinations or undervaccination[8].

The VFC program allows eligible children to receive immunizations at visits with their regular primary care provider, rather than being referred to the local health department. Allowing children to receive care from one provider supports the medical home concept and also increases continuity of care[7].

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CHILDHOOD IMMUNIZATIONS

Factors Impacting Vaccine Coverage Rates

Factors Associated With the Parent

Another factor impacting vaccination rates is parental knowledge. Parents, as well as health care providers, have an ever decreasing experience with vaccine-preventable diseases and thus do not have an appreciation of their impact. Vaccination information is readily available via the Internet, but the information may be misleading or unscientific[6]. Parents may download from the CDC website a Parents Guide to Childhood Immunizations.

Parents may download from the CDC website a **Parents Guide to Childhood Immunizations**.

The CDC also provides **suggestions and tips** on how to evaluate the validity of vaccine information found on the Internet.

Parents may have differing ideas about how risky vaccines are in general, or about one vaccine in particular, leading to a rejection of one or all vaccines. Their perceptions also may be influenced by past personal experience, religious beliefs, educational level, and perceived control over vaccine-related risks[8]. Other factors include parents being unaware that their child is due for immunizations, a lack of transportation, difficulty handling health insurance issues and navigating the health care system[9].

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CHILDHOOD IMMUNIZATIONS

Factors Impacting Vaccine Coverage Rates

Provider-Based Interventions

The National Vaccine Advisory Committee has issued a set of 17 standards for immunization practices for health care professionals, designed to be a national strategy to protect children against vaccine-preventable diseases. While the Committee acknowledges that it may be impossible for health care providers to adopt all 17 standards, incorporating as many standards as possible into their practice will help achieve the vaccination goals of Healthy People 2010[6]. The standards have been grouped into five areas:

- ***Availability of Vaccines***

  Vaccination services should be available both with the primary care provider and also outside the medical home, such as sports clinics, specialty physicians, and school health clinics to maximize vaccination opportunities. Parents should be assisted with identifying a primary care provider if necessary, and other providers should notify this provider if any vaccinations are given. Any barriers within a practice to receiving vaccinations should be minimized, such as requiring a well-child visit prior to receiving immunizations, long waits, inconvenient office hours, and delays in scheduling.

  Out-of-pocket expenses for parents can be minimized by having the practice participate in the **VFC Program**. As discussed previously, having health insurance plans pay for routine immunizations will also decrease the financial burden on parents[6].

  Health care providers may access the **Guide to Contraindications to Vaccinations** from the CDC.

  Click here to see Vaccine Information Statements provided by the CDC.

- ***Assessment of Vaccination Status***

  A child's vaccination status should be assessed at all health care visits, not just at well-child visits, to minimize missed opportunities. This assessment can also identify if any vaccinations were given in a different setting and allows a child's records to be updated. Health care providers need to observe only valid, medically-accepted contraindications when deciding to withhold any vaccinations. Withholding vaccines for reasons that are not contraindications also results in missed opportunities[6]. Health care providers may able to access this **Guide to Contraindications** to Vaccinations from the CDC.

- ***Effective Communication About Vaccine Benefits and Risks***

  Health care providers face the challenge of communicating effectively to parents the risks and benefits of vaccinations, the diseases that can be prevented, and the vaccination schedule. Vaccine Information Statements

(VIS) are required by federal law to be given to parents at any visit where vaccinations are given. The VIS is individualized for each vaccine, and summarizes the vaccine risks and benefits[6]. **Click here** to see VISs provided by the CDC

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CHILDHOOD IMMUNIZATIONS

Factors Impacting Vaccine Coverage Rates

Provider-Based Interventions (continued)

- *Proper Storage and Administration of Vaccines and Documentation of Vaccinations*

Properly storing vaccines and having written, up-to-date protocols in a practice helps to promote vaccine safety and decrease the amount of waste. The protocols should include vaccine storage and handling, administration techniques, medically-accepted contraindications, the current vaccination schedule, benefit and risk communication, treatment of adverse reactions, reporting of adverse reactions, and maintenance of vaccine records. Health care providers are encouraged to administer as many vaccines as needed at one visit. Giving multiple vaccines at the same visit does not affect their efficacy, which may be a concern for parents. The practice of giving as many vaccines as possible at any one visit can reduce the number of subsequent visits needed, and can also reduce the number of missed doses. Patient vaccination records should be easily accessible and include the date the vaccine was given, manufacturer and lot number, expiration date, signature and title of person giving the vaccine, and address where the vaccine was given[6]. Complete documentation in the patient record each vaccine given becomes essential when reporting an adverse reaction to the Vaccine Adverse Event Reporting System (VAERS). VAERS is the post-marketing safety surveillance system of the CDC and is discussed further in the next section.

Most children experience either mild side effects or none at all after being vaccinated. Mild side effects include soreness, redness, and/or swelling at the injection site, fussiness, or a mild fever. See a list of **side effects** that may be experienced for each vaccine. Side effects are also listed at the site for **Vaccine Information Statements (VISs)**. Although rare, children can experience a severe reaction, such as anaphylaxis, after receiving a vaccination. Health care providers need to be prepared for such an event and have both an emergency plan and equipment in place[10].

Health care providers can help ensure the post-licensure safety of vaccines by first asking parents to communicate about any adverse side effects, and then reporting these events to the Vaccine Adverse Event Reporting System (VAERS). VAERS is the national vaccine safety program of the CDC and the Food and Drug Administration that collects and analyzes data on adverse events associated with all vaccines licensed in the United States. Information that is considered essential when reporting an adverse event include: a description of the event and any treatment, date of vaccination, date of adverse event onset, the child's date of birth, vaccine type, manufacturer, lot number, route or site given, number of previous doses. The information is used to conduct ongoing evaluations of vaccine safety and further reduce the likelihood of adverse events. Health care providers can receive more information about **VAERS** and download a reporting form (On-line reporting is also available at this website).

The National Vaccine Injury Compensation Program (VICP) was created by Congress in 1986 in order to handle vaccine-related injury claims. Previously, claims were handled in the courts, with a large increase in lawsuits occurring after harmful side effects of DTP (diphtheria, tetanus, pertussis) were reported. As a result of these lawsuits, many pharmaceutical companies elected to cease manufacturing vaccines, resulting in shortages. Parents also chose not to have their children vaccinated, adding to a decrease in vaccination rates[11].

The VICP ensures the supply of vaccines at a reasonable cost and also is the "no-fault" system designed to handle vaccine-injury claims and compensate individuals and families. It provides liability protection to both pharmaceutical companies and health care providers and encourages research and development of new and safer vaccines. The VICP maintains the Vaccine Injury Table, which lists compensable injuries for each vaccine. **Click here** to access the Table, as well as further information about VICP, including claim filing information.

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COST BARRIERS

ANSWER
Virtual Patient Scenarios

QUESTION:

A 36-year old woman comes to your booth at the health fair at her church to have her cholesterol checked. The reading is 283. After you inform her of the results, she indicates an interest in doing something about this, but is concerned that she can't afford medication to lower her cholesterol. A. Aside from recommending that this woman seek advice from her regular physician, what advice can you provide her today that might be effective in helping her lower her cholesterol value? B. What else might she do to lower her overall cardiovascular risk? C. What low-cost pharmacologic options might her primary care physician mention to lower her cholesterol?

ANSWER:

a. weight reduction (if not at normal weight), regular daily exercise, reduced consumption of dietary fats

b. smoking cessation (if applicable)

   i. less evidence- daily aspirin, folate supplementation

   ii. "Mediterranean diet" – heavy on fish, grains, lower on meats, some red wine

c. increased dietary fiber intake may help, but may be insufficient to achieve desirable goal as a single step; omega-3-fatty acids can lower cholesterol value and are available without prescription – like fiber, a useful adjunct but rarely enough to lower sufficiently; bile sequestrant agents (cholestyramine) may reduce cholesterol; niacin is effective at lowering cholesterol and raising HDL and is relatively inexpensive; lovastatin is the single generic statin drug currently available (supply is approx. $30/month retail)

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Overcoming System-Level Barriers to Prevention

ANSWER
Virtual Patient Scenarios

QUESTION:
You are finishing a hectic day in primary care clinic and are seeing your last patient who is here to establish care. He is a 58-year-old retired mechanic with diabetes mellitus, hypertension, a previous heart attack, obstructive sleep apnea, and depression. He is obese; his blood pressure is 155/98, he has leg swelling and a cellulitis. You develop a plan to address his many chronic problems but realize after he has left that you have forgotten to address several aspects of routine health maintenance including colorectal cancer screening, previous immunization with tetanus, influenza, and pneumococcal vaccines, and lipid profile assessment. To avoid similar mistakes with future patients, what things can you do to ensure that individuals under your care will receive recommended preventive services?

ANSWER:

a. Create and use prevention worksheets (place on charts);

b. Develop reminder systems to facilitate delivery of preventive care (chart review before patient visit – or easiest if electronic medical record already being used)

c. Involve office staff in prevention by having them ask patients about specific items like immunization or current smoking status as a “vital sign”;

d. Schedule patients for "wellness visits" at which the focus is on remaining well/ attending to health maintenance needs

e. Engage patient in prevention by providing educational materials in waiting room that describe commonly used preventive services and those who benefit most;

f. Place posters in waiting and exam rooms encouraging patients to ask their provider about specific services

g. Mail reminders to patients about need for yearly services (ideally based on chart audit)

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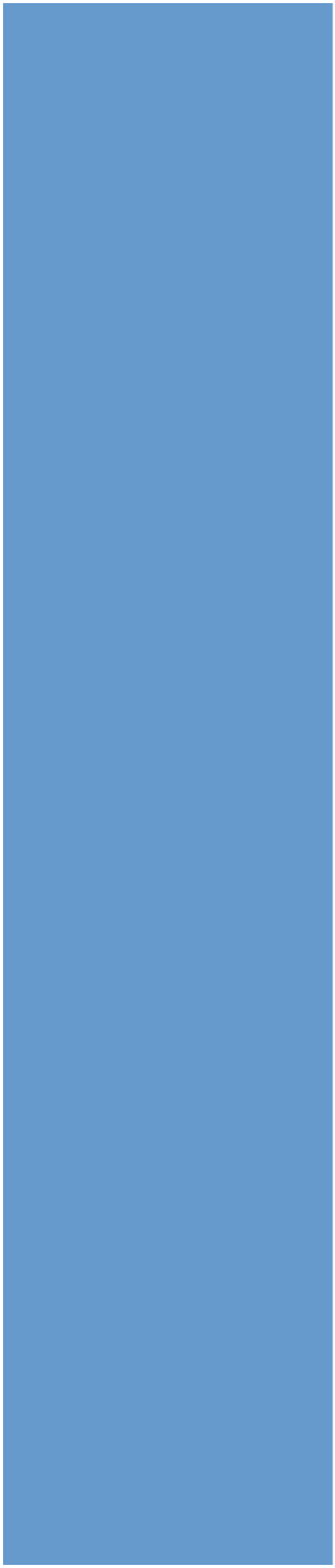

A TOUCH of SOUL

Recipes lower in salt, fat, and cholesterol

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MARION MERRELL DOW INC.

A Touch of Soul is our response to the needs of patients who must decrease their sodium and cholesterol intake, but can't give up their soul food. Soul food gets its taste from the salt and fat that are used in the preparation. The recipes contained in **A Touch of Soul** lower the sodium and cholesterol normally used in preparing soul food recipes. The recipes are not as low in sodium and cholesterol as the American Heart Association recommends, but the foods are healthier than traditional soul food. We tried to preserve as much of the soul food taste as possible. Perhaps, you can add a little more of this and a little less of that to improve the taste. Go ahead, try out your ideas, but don't add any more sodium or cholesterol to the recipes.

Soul food plays a big role in the African American Diet. **A Touch of Soul** gives everyone a chance to enjoy good eating and maintain a healthy diet.

From One Soul to Another,

Joyce Lee
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1. Exercise according to your doctor's recommendation.
2. Obtain your blood cholesterol level from your doctor.
3. To aid in lowering blood cholesterol levels and decrease the risk of certain cancers, it is recommended that everyone should increase their intake of fiber. (Example: Bran cereal, potatoes with skin, fresh fruit, etc.)

Suggested Menus

Breakfast

Orange Juice
Pancakes* Light Syrup
Margarine Skim Milk
Beverage

Orange Juice
Egg Substitutes (Scrambled)
Whole Wheat Toast† Jam
Skim Milk
Beverage

½ Grapefruit†
Oatmeal Margarine
Whole Wheat Toast†
Skim Milk
Beverage

Strawberries†
Cornflakes
Whole Wheat Toast†
Turkey Sausage*
Skim Milk
Beverage

Lunch

Sliced Turkey Sandwich
Tossed Salad†
Oil & Vinegar Dressing
Fresh Fruit†
Beverage

Tuna Salad Plate
(Tuna Salad Made with Egg Whites and Low Cholesterol Dressing)
Carrot and Zucchini Strips†
Crackers Fresh Fruit†
Beverage

Dinner

Baked Fish*
Baked Potato Cabbage*†
Cornbread*
Canned Fruit
Beverage

Turkey Loaf*
Herb Rice Green Beans*†
Pound Cake*
Beverage

Baked Chicken*
Mashed Sweet Potatoes*
Greens* Cornbread*
Fresh Fruit†
Beverage

* Denotes recipes found in book
† High fiber foods

Pancakes

2	tbsp.	margarine
⅔	cup	2% milk
2		egg whites
1	cup	flour
2	tsp.	baking powder
2	tbsp.	sugar
2	tbsp.	vegetable oil

Directions:

Beat the milk, margarine, and eggs lightly in a mixing bowl. Mix the flour, baking powder, and sugar. Add all at once to first mixture, stirring just enough to dampen the flour. Lightly grease a griddle or frying pan and set over moderate heat. Bake on the griddle until the cakes are full of bubbles on the top and the undersides are lightly browned. Turn with a spatula and brown the other side.

Turkey Sausage

1	lb.	ground turkey
1	tsp.	dry mustard
½	tsp.	garlic powder
½	tsp.	poultry seasoning
2	tsp.	sage
½	tsp.	black pepper
¼	tsp.	red pepper

Directions:

Mix all ingredients together and shape into patties. Cook in frying pan until done.

Turkey Breast

2	lbs.	turkey breast
½-½	tsp.	poultry seasoning
½-½	tsp.	sage
½-½	tsp.	black pepper
½-½	tsp.	mustard
½-½	tsp.	thyme
½-½	tsp.	ground ginger
½-½	tsp.	cumin
½-½	tsp.	garlic powder
1	cup	water

Directions:

Mix all spices in small bowl. Rub on both sides of meat. Place meat in shallow pan with cover. Add water to pan before adding meat. Bake at 350° for 2-2½ hours.

Turkey Loaf

1	lb.	ground turkey
1	tsp.	black pepper
½	tsp.	mustard
1		egg white
¼	tsp.	ginger
¼	tsp.	sage
¼	tsp.	poultry seasoning
¼	tsp.	cumin
¼	tsp.	thyme
¼	tsp.	ground garlic
¼	cup	green pepper, chopped
¼	cup	onions, chopped
¼	cup	no added salt ketchup
		vegetable cooking spray

Directions:

Mix well in bowl. Place in pan sprayed with vegetable cooking spray. Bake at 350° for 45 minutes.

Roast Beef

1 ½	lbs.	roast
¼-½	tsp.	black pepper
¼-½	tsp.	paprika
¼-½	tsp.	ground nutmeg
¼-½	tsp.	mustard
¼-½	tsp.	thyme
¼-½	tsp.	ground ginger
¼-½	tsp.	cumin

Directions:

Trim fat from around meat. Mix all spices in small bowl. Rub on both sides of meat. Place in shallow pan with cover. Bake at 350° for 1-1½ hours.

Chili

1	lb.	ground turkey
1	lb.	pinto beans (cook until juice is thick)
½	tsp.	red pepper
1	tsp.	minced garlic
1	tsp.	onion powder
2	tbsp.	chili powder
2	tsp.	dry mustard
1	cup	onions, chopped
1	cup	green peppers, chopped
1	cup	celery, chopped
1	cup	no added salt tomato puree
6	oz.	no added salt tomato paste
8	oz.	no added salt tomato sauce
½	cup	no added salt ketchup
1	cup	beef broth
1	tsp.	hot sauce

Directions:

Sauté onions, celery, and green peppers until soft. Add ground turkey; cook until brown. Add tomato products and spices; simmer for 15 minutes. Add beans and simmer for 15 minutes longer.

Ground Beef Meatloaf

1	lb.	ground beef
½	tsp.	nutmeg
1	tsp.	black pepper
½	tsp.	garlic powder
½	tsp.	ground thyme
½	tsp.	dry mustard
½	tsp.	cumin
1		egg
¼	cup	no added salt ketchup
2¼	cups	salt-free cracker crumbs
¼	cup	green peppers, chopped
¼	cup	celery, chopped
¼	cup	onion, chopped

Directions:

Combine all ingredients. Shape into a loaf. Place in greased pan. Bake at 350° for 1 hour.

Baked Chicken

3	lbs.	chicken legs, skinned
2	tsp.	black pepper
2	tsp.	paprika
½	tsp.	savry
½	tsp.	garlic powder
½	tsp.	cumin
1	tsp.	thyme
1	tsp.	ginger
1	tsp.	dry mustard
1	tsp.	sage
1	tsp.	poultry seasoning
1	tsp.	onion powder

Directions:

Combine all seasonings in a bowl. Rub on chicken. Spray shallow pan with vegetable cooking spray. Add chicken. Bake at 350° for 45 minutes or until chicken is tender and brown.

Spaghetti with Meat Sauce

1	lb.	ground turkey
½	lb.	spaghetti, cooked
19	oz.	whole tomatoes (canned, no added salt)
6	oz.	no added salt tomato paste
8	oz.	no added salt tomato sauce
1	cup	beef broth
1	cup	green peppers, chopped
1	cup	celery, chopped
1	cup	diced onions
1	tsp.	black pepper
1	tsp.	garlic powder
1	tsp.	basil
1	tsp.	oregano
3		bay leaves
½	tsp.	nutmeg

Directions:

Brown turkey; add onions, green peppers, celery, and garlic powder. Cook until vegetables are tender. Drain if necessary; add remaining ingredients, except spaghetti, and mix well. Cover and reduce heat. Simmer for 1 hour, stirring occasionally. Serve over cooked spaghetti.

Macaroni & Cheese

½	lb.	macaroni, 3 to 4 cups
8	oz.	formagy cheese
3		egg whites
1	tbsp.	corn oil margarine
1	tsp.	vegetable oil (in baking pan)
¼	tsp.	black pepper
¼	tsp.	onion powder
¼	tsp.	garlic powder

Directions:

Cook macaroni according to package directions. Drain macaroni and combine all ingredients except ¼ cup cheese. Pour into greased baking dish. Sprinkle with the remaining ¼ cup cheese and paprika. Bake at 350° for 30 minutes.

Broiled Fish

1	lb.	fish
1	tsp.	white pepper
1	tsp.	paprika
1	tsp.	onion powder
1	tbsp.	vegetable oil
2	tbsp.	lemon juice
		vegetable cooking spray

Directions:

Marinate fish in lemon juice and oil for ½ hour. Sprinkle with white pepper, paprika, and onion powder. Spray broiler pan with vegetable cooking spray. Lay pieces of fish on broiler and broil for 3-4 minutes on both sides.

Tuna & Dumplings Casserole

12½	oz.	tuna in water
6	oz.	cooked noodles
¾	cup	margarine
½	cup	flour
2½	cups	skim milk
1¼	tsp.	dry mustard
½	tsp.	garlic powder
¼	tsp.	white pepper
¼	cup	onions
¼	cup	celery

Directions:

Melt margarine in sauce pan; add flour, stirring constantly until mixture thickens. Combine all other ingredients with the white sauce. Spoon into a lightly greased baking dish and bake at 350° for 30-35 minutes.

Bar-B-Que Sauce

2½	cups	no added salt ketchup
½	cup	onions, chopped
1	cup	vinegar
2	tbsp.	margarine
1	tbsp.	lemon juice
3	tbsp.	brown sugar
½	tsp.	dry mustard
½	tsp.	garlic powder
2	tbsp.	black pepper

Directions:

Combine all ingredients in a sauce pan. Simmer for 30 minutes.

The following herb mixture recipes contain less than 1 mg sodium per teaspoon.

Mix #1

½	tsp.	dried lemon peel, grated
1	tsp.	celery seed, crushed
1	tbsp.	dried dill, crushed
1	tbsp.	basil, crushed
2	tbsp.	onion powder
1	tsp.	dried oregano
		pepper to taste

(This can be used on salads, soups, meat, fish, poultry, and vegetables.)

Mix #2

¼	cup	dried minced onion
1	tbsp.	sweet basil
1	tbsp.	ground cumin
1	tbsp.	garlic powder
1	tbsp.	black pepper

(This can be used on most foods.)

Mix #3

2	tbsp.	black pepper
1	tbsp.	paprika
2	tsp.	garlic powder
1	tsp.	onion powder
½	tsp.	red pepper

(This can be used on meat, poultry, or vegetables.)

Mix #4

2	tsp.	garlic powder
1	tsp.	black pepper
1	tsp.	sweet basil
1	tsp.	paprika
1	tsp.	onion powder

(This can be used on most foods.)

Vegetable Medley—Stir Fry

6		carrots
3	small	yellow zucchini
3	small	green zucchini
1	cup	celery
¾	cup	onion, diced
¼	cup	corn oil margarine
1	tbsp.	vegetable oil
½	tsp.	Italian seasoning
½	tsp.	nutmeg
½	tsp.	thyme
½	tsp.	cumin
½	tsp.	oregano

Directions:

Cut vegetables into thin strips. Heat oil and margarine in frying pan or wok. Add celery, onion, and carrots. Stir fry for 5 minutes. Add remaining ingredients. Stir fry until crisp-tender.

Baked Beans

4	cups	pinto beans, cooked
1	cup	onions, chopped
½	cup	celery, chopped
½	cup	green pepper
½	cup	brown sugar
1	tsp.	dry mustard
6	oz.	no added salt tomato paste
8	oz.	no added salt tomato sauce
1	tsp.	vinegar
½	cup	low-sodium ketchup

Directions:

Presoak beans overnight. Boil beans (no seasoning). Pour water off. Mix all ingredients well. Place in oven at 400° for 1 hour.

Green Beans

2½	lbs.	green beans
1	medium	onion
1		bay leaf
1½	cups	beef broth
½	tsp.	black pepper
½	tsp.	thyme

Directions:

Wash and break fresh green beans. Add salt-free beef broth, chopped onions, bay leaf, black pepper, and thyme. Cook for 1 hour or until done.

Beef Bone Stock

		beef soup bone

Directions:

Place soup bone in pan. Cover soup bone with water. Cook for 4 hours. Let set overnight. Skin fat off the top. Use to season greens, beans, dry peas, etc.

Black-eyed Peas

1	lb.	black-eyed peas
2½-3	cups	beef bone stock
1	medium	onion, chopped
1		bay leaf
½	tsp.	black pepper

Directions:

Cover peas with beef stock and add other ingredients. Bring to boil, turn to low heat, and cook until done (1½-2 hours).

Mixed Greens

2½-3	lbs.	mixed greens (mustard, turnips, and kale)
2	tbsp.	vegetable oil
½	tsp.	garlic powder
¼	tsp.	black pepper
½	tsp.	onion powder

Directions:

Pick and wash greens. Place greens in 3-quart pan. Add all ingredients. Cook until tender.

Mashed Sweet Potatoes

2	medium	sweet potatoes, cooked
½	cup	skim milk
¼	cup	corn oil margarine
½	tsp.	nutmeg
½	tsp.	cinnamon
½	tsp.	ginger

Directions:

Mash sweet potatoes. Combine all ingredients and add to sweet potatoes.

Cabbage

1	lb.	cabbage
½	cup	green pepper, chopped
½	cup	onion, sliced or diced
¼	cup	corn oil margarine
1	tsp.	garlic powder
To Taste		black pepper
To Taste		red pepper, crushed
¼	cup	water

Directions:

Wash and shred cabbage. Set aside. Melt margarine in skillet. Add onions and green pepper, sauté for 2 minutes. Add cabbage, spices, and water. Simmer for 15 minutes or until tender.

Cole Slaw

3	cups	cabbage, shredded
1	cup	carrots, shredded
½	cup	cucumbers, peeled and diced finely
1	tsp.	white vinegar
¾	cup	cholesterol-free salad dressing
½	tsp.	black pepper
¼	tsp.	dill weed

Directions:

Mix well. Refrigerate.

Macaroni Salad

3	cups	macaroni, cooked
¾	cup	cholesterol-free salad dressing
¼	cup	green pepper, chopped
¼	cup	celery, chopped
¼	cup	onion, chopped
¼	tsp.	white pepper
¼	tsp.	prepared mustard
¼	tsp.	cumin
¼	tsp.	vinegar

Directions:

Cook macaroni according to directions on the box. Drain well. Combine macaroni with all ingredients. Cover and chill before serving.

Potato Salad

5	cups	white potatoes, cooked and diced
¼	tsp.	white pepper
¼	tsp.	black pepper
⅛	tsp.	celery seed
¾	cup	celery, chopped
¾	cup	green pepper, chopped
1	tsp.	prepared mustard
¼	tsp.	dill weed
¼	cup	onion, chopped
1	cup	carrots, shredded
¾	cup	cholesterol-free salad dressing
½	tsp.	vinegar

Directions:

Mix thoroughly in a large bowl.

Cornbread

½	cup	cornmeal
½	cup	all-purpose flour
2	tsp.	baking powder
2		egg whites
½	cup	skim milk
2	tbsp.	vegetable oil
		vegetable cooking spray

Directions:

Combine cornmeal, flour, and baking powder. Add egg whites, milk, and oil. Stir until batter is smooth. Coat pan with vegetable spray and bake at 425˚until done.

Cornbread Dressing

3	cups	plain cornbread, crumbled
2½	cups	broth (chicken or turkey)
1	cup	onion
½	cup	celery
½	cup	green pepper
2		egg whites
1	tsp.	sage
2	tsp.	poultry seasoning
1	tsp.	onion powder
⅓	cup	corn oil margarine
1	tsp.	garlic powder

Directions:

Sauté celery, onions, and green pepper in oil until tender. Combine crumbled cornbread and seasoning. Add celery mixture, egg whites, and broth. Stir until cornbread is moist. Bake in 13x9x2-inch dish at 350˚ for 20-30 minutes.

Sweet Potato Pie

3	medium	potatoes
½	cup	corn oil margarine
1	tbsp.	nutmeg
½	tsp.	cinnamon
½	tsp.	vanilla flavoring
3		egg whites
¼	cup	sugar
¾	cup	skim milk

Directions:

Boil sweet potatoes until tender. Peel while warm; put in mixing bowl on low speed and mash well. Add all other ingredients and mix well. Pour into 9-inch, uncooked pie shell and bake at 350° for 45 minutes (or until knife inserted in center comes out clean).

Pie Crust

⅔-1	cup	cold water
1½	cups	flour
2	tbsp.	sugar
½	cup	corn oil margarine

Directions:

Combine flour and sugar. Cut in margarine until mixture resembles coarse meal. Stir in water with fork — one teaspoon at a time to moisten dry ingredients. Shape dough into a ball. Roll out dough until ⅛" in thickness on a lightly floured surface. Place in 9-inch pie pan. Trim off excess pastry around edge. Fold edge under and flute.

Pound Cake

1	cup	corn oil margarine
2	cups	sugar
8		egg whites
1	cup	2% milk
3	cups	all-purpose flour
2½	tsp.	baking powder
½	tsp.	nutmeg
1½	tsp.	vanilla flavoring

Directions:

Cream margarine and sugar until soft. Sift together flour, baking powder, and nutmeg. Add to creamed mixture with milk; beat until smooth. Add vanilla flavoring and egg whites. Spray pan with non-stick cooking spray. Scrape bowl and pour into tube pan or 2 loaf pans. Bake at 350° for 1 hour.

Peach Cobbler

pie crust

1½	cups	cold water
3	cups	flour
4	tbsp.	sugar
1	cup	corn oil margarine

Directions:

Combine flour and sugar. Slowly add margarine until mixture resembles meal. Stir in water with fork — one teaspoon at a time to moisten dry ingredients. Shape dough into a ball. Roll out half the dough until ¼" in thickness on lightly floured surface. Place in 9- or 10-inch pie pan.

filling

2 or 4	lbs. cups	fresh frozen peaches, sliced fresh peaches, peeled & sliced
¼	cup	margarine
½	tsp.	nutmeg
1½	cups	sugar
1	tsp.	vanilla flavoring
2	tbsp.	flour

Directions:

Mix sugar and flour in large bowl. Add peaches, nutmeg, vanilla flavoring, and margarine; toss well. Pile fruit into lined pie pan. Roll out the top crust and drape it over the pie. Bake at 350° for 1 hour or until done.

1. Bake, broil, roast, or grill all meats.
2. Do not eat eggs and red meats more than 2-3 times a week.
3. Use vegetable oil and low-fat dairy products.
4. Remove skin from poultry before cooking.
5. Eliminate desserts containing highly saturated fats such as butter, whole eggs, etc.
6. Season vegetables and beans with a small amount of vegetable oil and spices for flavor.
7. Increase the amount of fresh fruits, vegetables, pasta, dried beans, and peas eaten each day.
8. Decrease the amount of processed meats. Example: Cold cuts and hot dogs.
9. Do not use gravies or sauces.
10. Do not add salt.
11. 6-7 ounces of cooked meat, fish, or poultry are recommended each day.

One Ingredient for Another

1 cup skim milk	4 tablespoons non-fat dry milk plus 1 cup water
1 tablespoon flour, for thickening	½ tablespoon cornstarch, potato starch, rice starch, arrowroot starch, or 1 tablespoon tapioca
1 cup cake flour, for baking	⅞ cup all-purpose flour
1 cup all-purpose flour, for baking breads	Up to ½ cup bran, whole-wheat flour, or cornmeal plus enough all-purpose flour to fill a cup
1 cup sour milk, for baking	1 cup skim milk with one of the following: 1 tablespoon vinegar or 1 tablespoon lemon juice, or 1¾ teaspoon cream of tartar
1 egg, for cooking or baking	2 egg whites or 1 egg white plus 1 teaspoon of polyunsaturated oil

3 teaspoons	1 tablespoon
4 tablespoons	¼ cup
5⅓ tablespoons	⅓ cup
8 tablespoons	½ cup
10⅔ tablespoons	⅔ cup
12 tablespoons	¾ cup
16 tablespoons	1 cup
2 cups	1 pint
4 cups	1 quart
4 quarts	1 gallon
8 quarts	1 peck
4 pecks	1 bushel
16 ounces	1 pound
32 ounces	1 quart
8 ounces of liquid	1 cup
1 ounce of liquid	2 tablespoons

For dry and liquid measurements, use standard measuring spoons and cups. All measurements are level.

Men

Height Feet	Height Inches	Small Frame	Medium Frame	Large Frame
5	2	128-134	131-141	138-150
5	3	130-136	133-143	140-153
5	4	132-138	135-145	142-156
5	5	134-140	137-148	144-160
5	6	136-142	139-151	146-164
5	7	138-145	142-154	149-168
5	8	140-148	145-157	152-172
5	9	142-151	148-160	155-176
5	10	144-154	151-163	158-180
5	11	146-157	154-166	161-184
6	0	149-160	157-170	164-188
6	1	152-164	160-174	168-192
6	2	155-168	164-178	172-197
6	3	158-172	167-182	176-202
6	4	162-176	171-187	181-207

Women

Height Feet	Height Inches	Small Frame	Medium Frame	Large Frame
4	10	102-111	109-121	118-131
4	11	103-113	111-123	120-134
5	0	104-115	113-126	122-137
5	1	106-118	115-129	125-140
5	2	108-121	118-132	128-143
5	3	111-124	121-135	131-147
5	4	114-127	124-138	134-151
5	5	117-130	127-141	137-155
5	6	120-133	130-144	140-159
5	7	123-136	133-147	143-157
5	8	126-139	136-150	146-163
5	9	129-142	139-153	149-170
5	10	132-145	142-156	152-173
5	11	135-148	145-159	155-176
6	0	138-151	148-162	158-179

* Metropolitan Life Insurance

JNC-VI Treatment Recommendations for High Risk Hypertensives

BP Stage	Systolic BP (mmHg)	Diastolic BP (mmHg)	Risk Group C •Diabetes...and/or •TOD & CCD •± Other risk factors
High Normal	130-139	85-89	Drug therapy§
Stage 1	140-159	90-99	Drug therapy

TOD = Target Organ Damage; CCD = Clinical Cardiovascular Disease
§For those patients with heart failure, renal insufficiency, and diabetes mellitus

JNC-VI. Arch Intern Med. 1997;157(21):2413-2446.

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Treatment of High Risk Hypertensives

Patient type	BP treatment goal	# drugs required
High risk group C	<130/80	~2-3
Diabetics with >1gm Proteinuria	<125/75	~3-4

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Breast Cancer

Epidemiology

Screening for Breast Cancer

(continued—)

- **Mammography:** Mammography screening aims to reduce morbidity and mortality from breast cancer by early detection and treatment. Mammography utilizes low-dose x-rays to visualize the internal structures of the breast. Data published by the USPSTF indicates a decrease in mortality among women who are screened for breast cancer using mammography. This data demonstrates a relative risk of 0.84 for all age groups of women screened, with the lowest relative risk for women between the ages of 50 and 74 years (RR 0.78). Women between the ages of 40 and 49 years exhibited a relative risk of 0.85. The USPSTF reports the sensitivity of mammography ranging between 71% and 96%. However, sensitivity is substantially decreased for women in their forties versus older women. Factors that affect this sensitivity include; breast density, HRT, and film quality. **The Effects of Age, Breast Density, and Hormone Therapy on the Accuracy of Screening Mammograms -- 138 (3): 28 -- Annals of Internal Medicine**. The positive predictive value of mammography for breast cancer ranges from 20% in women under age 50 to 60% to 80% in women age 50 to 69 years of age.

Full Text Article ***Individual and Combined Effects of Age, Breast Density, and Hormone Replacement Therapy Use on the Accuracy of Screening Mammography***

It has been demonstrated that mammography screening reduces the mortality from breast cancer. This evidence is strongest for women age 50 to 69 years. Conversely, the potential harms of screening with mammography reduce with age. These include false-positive results, unnecessary anxiety, biopsies, and cost. The age at which potential benefits of mammography balance the potential harms of mammography is subjective. Because breast density increases the rate of false negatives and false positives in mammography, it has been suggested that women ages 40 to 49 years received scheduled mammograms during the follicular phase of their menstrual cycles, in which the breast tissue is less radiographically dense. **Cancer Spectrum: White et al., pp. 906-910.**

The efficacy of mammography has been studied and debated for a number of years. Various articles have been published on this issue.

- Peter C Gøtzsche, Ole Olsen Jan 9 2000, Lancet Conclude that screening

for breast cancer with mammography is unjustified, one breast-cancer death is avoided whereas the total number of deaths is increased by six.
Is Screening for Breast Cancer with Mammography Justifiable

- In the randomized, controlled trials, mammography reduced breast cancer mortality rates among women 40 to 74 years of age.

Breast Cancer Screening: A Summary of the Evidence for the U.S. Preventive Services Task Force

- Recent article in BJC found decreased rates of advanced breast CA associated with mammography screening. **Decreased Rates of Advanced Breast Cancer due to Mammography Screening in The Netherlands**

- Recent article in Lancet linked routine mammography screening to a reduction in breast-cancer mortality rates in women aged 55-74 years.
Mammography Screening on Breast Cancer Mortality

Based on these and other trials and studies, several sets of screening recommendations for breast cancer have been proposed by a number of organizations. These include recommendations from the American Cancer Society, USPSTF, the American College of Radiology, the American College of Obstetricians and Gynecologists, American College of Physicians, and the American Academy of Family Physicians. Most recommendations begin mammography screening of average risk women at age 40 years, with mammograms every 1 to 2 years until age 50. Yearly mammograms after 50 years of age are almost universally recommended. Clinical breast exams are important screening tools and are recommended by most organizations beginning at age 20, performed every three years, and yearly at age 40 and above. The following table outlines the ACS and USPSTF current recommendations.

Screening	American Cancer Society	USPSTF
Breast-Self Exam	Optional monthly breast self-exam age 20 and older	Insufficient evidence to recommend for or against teaching or performing routine BSE
Clinical Breast Exam	CBE every three years from age 20 to 39 CBE annually for age 40 and older	Insufficient evidence to recommend for or against routine CBE alone to screen for breast cancer
Mammography	Recommends screening mammography annually age 40 and older	Recommends screening mammography, with or without CBE every 1 to 2 years age 40 and older

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Breast Cancer

Epidemiology

Diagnosis

Pathological diagnosis of breast cancer may be made using a number of biopsy techniques. These include; fine-needle aspiration, wide-bore needle biopsy, and excisional biopsy.

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Breast Cancer

Barriers to Screening

Several barriers to screening have been identified. These include; low income, education level, linguistic and cultural differences, inadequate access to physician referrals, comorbid conditions, and fears or concerns about the discomfort, costs, or outcomes that may be associated with screening tests. A number of studies have looked at the impact of these barriers on the likelihood of woman obtaining screening mammograms.

- **Breast Cancer Screening Attitudes and Behaviors of Rural and Urban Women**
- **African American Women's Breast Memories, Cancer Beliefs, and Screening Behaviors**
- **Fear, Anxiety, Worry and Breast Cancer Screening**
- **Disparities in Screening Mammography**
- **Limiting Comorbid Conditions and Breast Cancer Stage at Diagnosis**
- **Enthusiasm for Cancer Screening in the United States**

The American Cancer Society reports disparities in the percent of women over 40 years of age that have had mammograms in the last two years. **Cancer Prevention and Early Detection**

- Seventy-two percent of white women have had a mammogram in the last two years, while only 68% of African American women, 63% of Hispanic women, and 52% of American Indian/Alaskan Native woman have had mammograms within this time frame.
- Women in rural areas are less likely to have had a mammogram within the last two years when compared with women living in urban areas, 66% versus 75%.
- Women with 11 or fewer years of education are less likely to have had a mammogram within the last two years than women with 13 or more years of education, 57% versus 76%.

- Seventy-four percent of women with health insurance coverage have had mammograms within the last two years versus 39% with no coverage.

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Breast Cancer

Breast Cancer Cost Considerations

- The NIH estimates the total cost of cancer in the United States in 2001 was $156.7 billion. This included $56.4 billion in direct costs, $15.6 billion in indirect costs, and $84.7 billion in indirect mortality.
- Breast cancer costs are estimated to be 20% to 25% of total cancer costs, accounting for $31 to $39 billion in 2001.
- Costs per patient for initial care in 1992 were estimated at $10,813, with continuing care accounting for $1,084, and terminal care of $17,886 per patient. **Breast Cancer Management: Quality of Life and Cost Considerations**
- Studies have been done assessing the cost of care associated with metastatic breast cancer, demonstrating an inverse relationship between costs and the age of the patient. This relationship is attributed to less combination treatments being provided to older patients. **Cost of Illness Associated with Metastatic Breast Cancer**

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Breast Cancer

Lifestyle and Behavioral Modifications

Modifiable risk factors exist that contribute to a woman's risk of developing breast cancer. Reduction in a woman's exposure to these risk factors will likely decrease her chances of developing breast cancer.

- Decrease alcohol intake to below two drinks per day.
- Avoid postmenopausal obesity.
- Increase physical activity.
- Avoid estrogen and progestin HRT.

The Prevention of Breast Cancer

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Breast Cancer

Prevention Programs

The National Breast and Cervical Cancer Early Detection Program (NBCCEDP), directed by the Centers for Disease Control and Prevention (CDC), was implemented to help low-income, uninsured, and underserved women gain access to screening programs for the early detection of breast and cervical cancers. When Congress passed the Breast and Cervical Cancer Mortality Prevention Act of 1990, the NBCCEDP was created, with funding for 2003 of $200.6 million to support both screening and diagnostic services for these women. This funding covers clinical breast exams, mammography, pap tests, surgical consultation, and diagnostic testing resulting from abnormal screening. From its inception until 2002, approximately 1.75 million women have been provided screening services, with over 4 million screening examinations. These screenings resulted in the diagnosis of approximately 14,446 breast cancers, 55,210 precancerous cervical lesions, and 1,020 cervical cancers.

The National Breast and Cervical Cancer Early Detection Program

PDF version ***The National Breast and Cervical Cancer Early Detection Program***

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Breast Cancer

Primary Prevention of Breast Cancer

The primary prevention of breast cancer addresses reducing the exposure to risk factors that increase a woman's risk of developing breast cancer over her lifetime. These risk factors, along with lifestyle modifications, have been outlined earlier and include exogenous hormones, alcohol, radiation, postmenopausal obesity, and lack of physical activity. Other primary prevention may be undertaken for women at higher risk for breast cancer due to genetic risk factors, such as a strong family history and/or positive genetic testing for BRCA1 and BRCA2. These include chemoprevention and prophylactic mastectomy.

- An algorithm for genetic screening in women with a family history of breast cancer has been suggested. This algorithm is based on recommendations of the task force on genetic risk of breast cancer organized by the National Institutes of Health and the National Human Genome Research Institute. The recommendations for genetic testing, along with clinical evaluation and screening of high risk women, include the following points:
  - A positive family history of breast cancer in two first-degree relatives, one first-degree relative less than 50 years of age, or a male relative.
  - Patient desires genetic testing.
  - Genetic counseling and testing for known mutations in affected relatives.
  - Patients testing positive for BRCA1/BRCA2 receive annual CBE and mammograms after the age of 25 years.
  - Possible prophylactic mastectomy after childbearing.

Screening for Genetic Risk of Breast Cancer — January 1, 1999 — American Academy of Family Physicians.

- The Breast Cancer Prevention Trial (BCPT) demonstrated a 49% reduction in invasive breast cancer in high-risk women who were taking Tamoxifen compared to women taking placebo. **Breast Cancer Prevention Studies, Cancer Facts 4.18**
- The STAR trial, Study of Tamoxifen and Raloxifene, is currently underway. It is analyzing the effects of Tamoxifen versus Raloxifene for the prevention of breast cancer in postmenopausal women. Initial results from this trial should be published in 2005. **STAR Trial**
- Bilateral prophylactic mastectomy was shown to reduce the risk of breast

cancer in women with BRCA1 and BRCA2 mutations by 90%. **Bilateral Prophylactic Mastectomy**

- Women at increased risk of developing breast cancer may benefit from additional screening strategies, such earlier mammography screening, more frequent clinical breast exams, or the use of other screening modalities, such as magnetic resonance imaging.

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CHILDHOOD IMMUNIZATIONS

Factors Impacting Vaccine Coverage Rates

Provider-Based Interventions (continued)

- *Implementation of Strategies to Improve Vaccination Coverage*

Health care providers are encouraged to set up a reminder/recall system for their patients in order to help increase vaccination rates. A "reminder" is when a vaccination or vaccinations are due and a "recall" is when a vaccination or vaccinations are overdue. Patients can be contacted either via mail or phone call, while more intensive efforts may be needed for non-compliant or high-risk families. The patient's chart can also be flagged in some way so that the health care provider is alerted when a vaccination is needed[6].

The Standards of the National Advisory Committee also recommend an annual patient chart review to determine the vaccination coverage rate within a particular practice or setting. The data collected from such an assessment can help the practice identify areas that need to be changed in order to increase vaccination rates and the delivery of other preventive care services[6].

The Centers for Disease Control and Prevention (CDC) provides software that can be used by individual sites or practices to manage vaccination data. The Clinic Assessment Software Application (CASA) can be downloaded from

The **Clinic Assessment Software Application (CASA)** is a multifunction database that allows a practice to record, organize, and analyze its data relating to vaccination practices.

Each practice can individualize coverage reports and feedback generated by CASA. These reports include:

- vaccination coverage levels for two different age cohorts
- antigen-specific coverage levels
- missing immunizations
- missed opportunities
- reminder and recall notices[12]

See the **Standards for Child and Adolescent Immunization Practices** by the National Vaccine Advisory Committee.

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CHILDHOOD IMMUNIZATIONS

Immunization Registries

Starting in l993, the Centers for Disease Control and Prevention (CDC) began awarding grants to states to develop immunization registries, with the long range goal of developing a nationwide network. An immunization registry is a geographically-based computer system designed to collect vaccination data. Participation in this registry would be voluntary, with families being informed of the registry's purpose and use. Families also need their right to privacy ensured, and confidentiality of registry information needs to be protected[13].

Ideally, all children would be included in a registry and all health care providers would participate. Immunization registries have the potential to increase vaccination rates by reducing the incidence of missed doses and eliminating the scattering of vaccination records. Additionally, immunization registries can identify children who are either due or late for vaccinations, assisting a practice in generating reminder or recall notices[13].

One of the goals of Healthy People 2010 is to have 95% of children under the age of six years participating in an immunization registry. In 2002, survey data collected by the CDC showed that about 43% of children were enrolled in a registry[16]. Barriers to reaching the Healthy People 2010 goal include difficulty recruiting health care providers to participate in a registry. Health care providers would need to have personnel trained in registry use and change vaccination protocols to rely on data from the registry. Because immunization registries are either state or community based, there is no coordination of hardware and software packages used, resulting in difficulty transferring data[13].

Information on **Immunization Registries**.

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CHILDHOOD IMMUNIZATIONS

State of Ohio Vaccination Requirements

The Ohio Revised Code dictates minimum vaccination requirements for children over 20 months of age attending day care/Head Start, kindergarten, and grades 1-12. Each institution or school is required to submit a summary of the immunization status of its students by October 15th of each year. Students not meeting the minimum requirements are considered in violation of Ohio law, but may remain in school only if they have received a certain number and type of immunizations based on age group and are currently in the process of obtaining the minimum required doses.

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Breast Cancer

Secondary Prevention of Breast Cancer

The secondary prevention of breast cancer aims at detecting and treating breast cancer in women who are asymptomatic. It has been demonstrated that early detection and treatment of breast cancer leads to reduced morbidity and mortality. Secondary Prevention consists of a number of imaging modalities, clinical breast exams, and breast self-exams.

- **Imaging Modalities**
  - **Mammography**: Recommendations for the screening of asymptomatic women include the initiation of screening at 40 years of age. Screening should be performed every 1 to 2 years for women of average risk. Women at higher risk, with a family history of breast cancer, may need initiation of screening below the age of 40 years. Some recommendations include initiation of mammography screening at 35 years of age or five years before the onset of breast cancer in the youngest affected relative. Women who have had genetic testing and are positive for BRCA1 or BRCA2 mutations may need mammography screening at as young as 25 years of age. Although the USPSTF and American Cancer Society do not specifically recommend mammography in women younger than 40 years who are at increased risk of breast cancer, the initiation of mammography at younger ages is discretionary, based on both the patient's and physician's discussions, experiences, and preferences.

ACS Guidelines for Breast Cancer Screening: Update 2003.

  - **Ultrasound:** Ultrasound is often used as an adjunct to mammography, but is not currently recommended as a primary screening modality. Ultrasound may be used for further evaluation of mammographic features, such as solid versus cystic lesions or for accurately determining the size of spiculated lesions. Additionally, Doppler imaging can elucidate blood flow patterns and aid in determining benign from malignant lesions.
  - **MRI:** Although MRI is not currently recommended as a primary screening modality, recent studies support it's use for screening high-risk women. **NEJM -- Efficacy of MRI and Mammography for Breast-Cancer Screening in Women with a Familial or Genetic Predisposition.** MRI has also been used to evaluate women with breast implants and scarred breasts.

- **Clinical Breast Exams:** CBE's are currently recommended by the American Cancer Society. For women between the ages of 20 and 39 years, a CBE is

recommended every 3 years. For women over 40 years of age, an annual CBE is recommended. Women that carry a higher risk of breast cancer may need more frequent CBE's, as often as every six months for women with BRCA1 or BRCA2 mutations.

- **Breast Self-Exam:** Monthly BSE's are not required or recommended under the current American Cancer Society or USPSTF recommendations. However, the ACS recommends communicating the benefits and limitations of BSE to patients and encouraging patients to report any changes they may notice in their breasts.

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Breast Cancer

Tertiary Prevention of Breast Cancer

Tertiary prevention of breast cancer aims at preventing progression of clinical disease and reducing morbidity and mortality from the disease. The current treatments for breast cancer, once it is diagnosed, include the following:

- Surgery: lumpectomy, mastectomy
- Chemotherapy
- Radiation
- Hormone Therapy: Tamoxifen, Aromatase Inhibitors
- Monoclonal Antibody Therapy: Herceptin
- Antiangiogenic Therapy
- Metronomic Therapy: combination of chemotherapy and antiangiogenic therapy

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Breast Cancer

Key Findings

- Breast cancer is associated with identifiable risk factors, some of which are modifiable.
- Lifestyle and behavioral modifications can help reduce a woman's risk of developing breast cancer.
- The American Cancer Society and U.S. Preventive Services Task Force have defined screening recommendations, based on numerous clinical trials, for women at average risk for breast cancer.
- Specific screening recommendations for women at high risk for breast cancer, based on family history and/or genetic testing, are not available from these organizations. Initiation of screening at an earlier age is a general guideline for these women. Women and their doctors must make individualized decisions about screening frequency and modality based on individual circumstances and experiences.
- Research continues in chemoprevention and imaging modalities which may further reduce morbidity and mortality associated with breast cancer in the future.

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Interest Groups (IGs) are collections of AMSA members who share a similar interest. Each group has their own web page and listserve to facilitate dialogue on their common interest. Additionally, IGs cultivate interest and working relationships through programming at National Convention and Regional Conferences. IGs are created by student nomination in the House of Delegates, during National Convention, and exist for two years. IG Specialty Forums were created to denote IGs with an academic focus.

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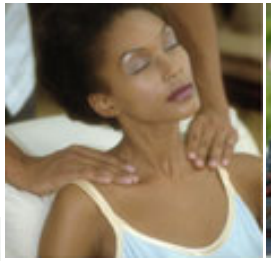

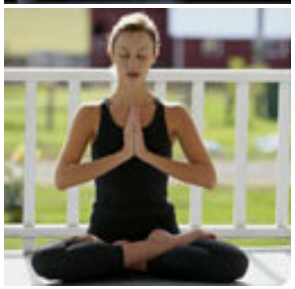


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Maximizing ROI in Health Promotion: Improving Health, Reducing Costs

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I am delighted to invite you to the 2008 Art and Science of Health Promotion Conference, which will be held San Diego, March 5-8, 2008. We are proud to be staging this conference in conjunction with IHRSA, the International Health, Racquet & Sportsclub Association. This collaborative effort allows us to offer you our usual spectrum of outstanding speakers plus a trade show of over 400 exhibiting companies. You will also have access to over 100 additional sessions offered at the IHRSA Convention. As a field, it also allows us to spread the health promotion message to the more than 4000 health clubs involved with IHRSA.

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Our conference theme is "Maximizing ROI in Health Promotion: Improving Health, Reducing Costs." Read more about the theme and program below.

Maximizing ROI in Health Promotion: Improving Health, Reducing Costs

Over the past three decades, health promotion has evolved from a clever but vague idea about helping people change their habits to improve their wellbeing to a well developed art based on solid science. We now know that lifestyle habits account for half of all premature deaths, are the primary cause of six of the top ten causes of death, and accelerate the onset of disability by nearly a decade. We also know that lifestyle factors account for a quarter to half of medical care costs, and that the cost of productivity losses are greater than the medical care costs. Smoking, lack of exercise, and poor nutrition are linked to a multitude of conditions ranging from heart disease to cancer, erectile dysfunction and dementia. Excellent programs have prevented and sometimes reversed these conditions.

So what works best? What programs and strategies yield the most dramatic health improvements? What programs and strategies reduce medical costs most effectively? Which ones have the greatest impact on absenteeism, presenteeism, and overall productivity enhancement? Which ones are best for employee morale? Which programs and strategies are most cost effective? What is the best way to measure health improvements and financial returns? What outcomes are realistic to expect? How do you develop and implement a program that produces

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the best outcomes? To sum it up, how do we maximize ROI?

The 2008 Art and Science of Health Promotion Conference will explore these questions.

Michael P. O'Donnell, PhD, MPH, MBA
Program Chair, Art and Science of Health Promotion Conference
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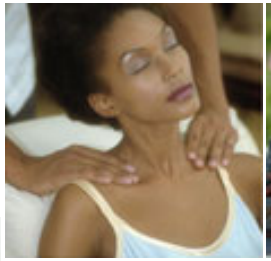


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AMERICAN HOLISTIC MEDICAL ASSOCIATION

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Our Vision} *The AHMA is working to transform healthcare to integrate all aspects of wellbeing, including physical, environmental, mental, emotional, spiritual and social health; thereby contributing to the healing of ourselves and of our planet.*

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For AHMA Members	**For the Public**
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2008 AANP/AHMA Conference	Become a Member of the AHMA-For Doctors, Associates, and Friends
HARPS – Holistic Area Resource Person	Doctor Finder - Physician Referral Directory
Video-Holistic Based Integrative Medical Center	Video-What is holistic medicine?
Holistic Physician Certifying Organization (ABHM)	Resources for the Public
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Donate Today to the AHMA!
2008 Art and Science of Health Promotion Conference

Please note: Effective February 15, 2008, the AHMA organization will be relocating to:

One Eagle Valley Court, Suite 201
Broadview Heights, Ohio 44147

Phone: 440-838-1010
FAX: 440-838-3627

Please welcome **Donna Nowak** as the new Executive Director for AHMA.
Donna may also be contacted at: dnowak@holisticmedicine.org

Please update your records with this new contact information for AHMA.

This site is best viewed with Internet Explorer or Mozilla Firefox for PC or Safari for Mac users.

American Holistic Medical Association
One Eagle Valley Court
Broadview Hts, Ohio 44147
Phone: 440.838.3675 Fax: 440.838.3677
info@holisticmedicine.org

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Education

Medical Students - Summer Institute in Geriatric Medicine

Director: Rebecca A. Silliman, MD, PhD
Co-Director: Sharon A. Levine, MD
Co- Director: Delarra M. Terry, MD, MPH

The Summer Institute in Geriatric Medicine at Boston University Medical Center will be held June 23–27, 2008.

This program is sponsored by the American Geriatrics Society and the *Boston University School of Medicine* with funding from the National Institute of Aging. Participants in recent years have been very enthusiastic about the value of the program and NIA has refunded us through 2011.

The Summer Institute in Geriatrics is a week-long conference designed for medical students who are interested in pursuing careers in academic geriatric medicine and geriatric research. Activities of the Summer Institute include clinical and research seminars on key geriatrics/aging topics, site visits to clinical programs, and small group development of a research proposal. Faculty members include nationally recognized academic geriatricians and Boston University faculty conducting aging research.

A maximum of 20 students will be selected to participate in this program. Please note that applications must be received either electronically or in paper format by **Friday, January 25, 2008**. **Full financial support will be provided.**

Visit the American Geriatrics Society website to apply for the 2008 Summer Institute in Geriatric Medicine. Successful candidates will be notified by March 2, 2008. Inquiries should be directed to: Jill Whitney at 617-638-6155.

Funding Opportunities of Interest to Junior Faculty and Fellows

Career Development Awards

- The American Foundation for Suicide Prevention
- Doris Duke Charitable Foundation's Clinical Scientist Development Award
- The Dennis W. Jahnigen Career Development Awards Scholars Program
- Paul B. Beeson Career Development Awards in Aging
- The Brookdale Foundation Leadership in Aging Fellowship Program
- 2007 Practice Change Fellows and The Atlantic Philanthropies
- Mentored Clinical Scientist Award (K08)
- Mentored Patient-Oriented Award (K23)
- VA Research Award
- Geriatrics Outcomes Scholars Award
- T. Franklin Williams Award
- Pfizer Scholars Awards
- The Robert Wood Johnson Foundation (RWJF) Nurse Faculty Scholars Program

Minority Career Development Awards

- NIH Minority Supplement Award
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Fellow Awards

- *Kirschstein National Research Service Awards*

Other Resources

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NIH K Kiosk:

- Information about NIH Career Development Awards

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- National Institutes of Health New Innovator Award
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- Charles E. Culpeper Scholarships in Medical Science
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- The Robert Wood Johnson Scholars in Health Policy Research Program
- The Robert Wood Johnson Health & Society Scholars Program

Career Development Awards

The American Foundation for Suicide Prevention
Level: for all categories of research grants and fellowships
Award Information: AFSP grants are awarded for one or two-year periods. The grant maximums are: Standard Research Grants $75,000, Young Investigator Grants $85,000, Pilot Grants $30,000 and Distinguished Investigator Grants and Postdoctoral Research Fellowships $100,000.
Description: AFSP research grants support studies that aim to increase understanding of the causes of suicide and factors related to suicide risk, or to test treatments and other interventions designed to prevent suicide. Investigators from all academic disciplines are eligible to apply, and both basic science and applied research projects will be considered, providing the study has an essential focus on suicide or suicide prevention. AFSP grants are awarded for one or two-year periods.
Application: Deadline: December 15, 2007 and June 15, 2008. Please visit click here for more information. Contact: Tracey Auster at tauster@afsp.org or 212-363-3500, ext.15 with questions.

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Doris Duke Charitable Foundation's Clinical Scientist Development Award
Level: junior physician-scientists; clinical investigators at the instructor or assistant professor level from accredited, degree-granting institutions in the United States, conducting research in any disease area.
Award Information: the foundation will award at least 15 three-year grants in 2008 of $125,000 per year in direct costs and $10,000 per year in indirect costs
Description: Designed to help junior physician-scientists transition to independent clinical research careers. Each U.S. accredited, degree-granting institution-which encompass all affiliated graduate schools, related hospitals and research institutes and different divisions, departments, hospitals, etc.-may nominate up to three candidates in any disease area. The foundation strongly encourages institutions to nominate women and under-represented minorities in medicine. Eligible nominees have received their M.D., are working in a U.S. degree-granting institution, and have been appointed to their first full-time faculty level position between January 1, 2003 and January 1, 2008.
Application: Deadline: January 8, 2008; Nominations due November 14, 2007. Please visit http://www.ddcf.org/mrp-csda for more information.

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The Dennis W. Jahnigen Career Development Awards Scholars Program
Level: junior faculty
Award Information: Up to ten two-year career development awards will be given in 2008. Each grant will provide two-year support of $75,000 per year for salary and fringe benefits and/or the costs of doing research. Each scholar's institution must provide a minimum match of $25,000 per year. The Jahnigen Award may not be used to support indirect costs. Awards are not transferable to another institution
Description: The award supports junior faculty in anesthesiology, emergency medicine,

general surgery, gynecology, ophthalmology, orthopaedic surgery, otolaryngology, physical medicine and rehabilitation, thoracic surgery, and urology. The award allows individuals to initiate and ultimately sustain a career in research and education in the geriatrics aspects of their discipline.
Application: Deadline: December 4th, 2007. Announcement date: April 1, 2008. Please visit http://www.americangeriatrics.org/specialists/jahnigen/apply/.

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Paul B. Beeson Career Development Awards in Aging
Level: Individuals with a clinical doctoral degree and have completed clinical specialty training by the time of award
Award Information: Approximately $1.8 million is available in FY 2008 to fund 8-12 new grants for 3-5 years of mentored career development support
Description: This program provides three to five years of mentored career development support to clinically-trained faculty members in strong research environments to enable them to gain skills and experience in aging research, under the guidance of a mentor or mentors, and to establish an independent program of research in this field. It also includes an annual meeting that allows opportunities to partner with national mentors and fellow awardees. Eligible applicants are U.S. citizens or permanent residents of the U.S. and have not received R01 or similar support as a principal investigator. Eligible organizations include: For-profit or non-profit organizations; Public or private institutions, such as universities, colleges, hospitals and laboratories; Foreign institutions are not eligible to apply.
Applications: Letter of intent deadline: November 18, 2007. Application deadline: December 18, 2008. For more information, please visit the NIH Web site: http://grants1.nih.gov/grants/guide/rfa-files/RFA-AG-08-006.html.

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The Brookdale Foundation Leadership in Aging Fellowship Program
Level: Junior Faculty
Award Information: Two years of support to junior academics for a project that will help establish them in an area of aging research. A grant award of up to $125,000 each year is intended to cover 75% of the fellow's time, base salary and fringe benefits.
Description: This program encourages emerging leaders in the field of aging. Eligible candidates demonstrate ongoing commitment to a career in aging; have a mentor at the sponsoring institution; agree to commit at least 75% of his/her time for career development during each year of the fellowship; and are between the first and tenth years of their graduate degree.
Applications: Deadline: November 1, 2007 at 5 pm EST. Applications and more information are available at www.brookdalefoundation.org/Leadership/BNFLeadership.htm. Contact Nora O'Brien at (212) 308-7355, ext. 104 or via email at norao@brookdalefoundation.org with questions.

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2007 Practice Change Fellows and The Atlantic Philanthropies

Level: Applicants should have some experience creating or managing aging-related programs (see FAQ).

Award Information: two-year awards are for $90,000 ($45,000/year). Up to 10 awards will be made in 2007. The applicant's home institution is expected to provide a monetary or in-kind contribution of $45,000 over the two-year period. Practice Change Fellows are expected to dedicate approximately 20% of their full time effort to participating in the program activities, designing, implementing, and evaluating their new geriatric programs or service lines.

Description: The Practice Change Fellows program is designed to expand the number of health care leaders who can effectively promote high quality care to older adults in a wide range of health and health care organizations. The long-term goal is to establish a network of health care practice change specialists with the capacity to influence care for this population on a national scale.

Application: The applications deadline for the 2007 program is April 4, 2007. For further information, please visit www.practicechangefellows.org or contact Amita Chugh at (303) 724-2523 or via email at amita.chugh@uchsc.edu.

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Mentored Clinical Scientist Award (K08)

Level: Junior Faculty

Award Information: Mentor based. Salary and some laboratory/research; 3-5 years support; amount depends on specific NIH Institute; now includes AHRQ.

Description: The purpose of the Mentored Clinical Scientist Development Award (K08) is to support the development of outstanding clinician research scientists. This mechanism provides specialized study for individuals with a health professional doctoral degree committed to a career in laboratory or field-based research. Candidates must have the potential to develop into independent investigators. The K08 supports a three, four, or five year period of supervised research experience that may integrate didactic studies with laboratory or clinically-based research. The proposed research must have intrinsic research importance as well as serving as a suitable vehicle for learning the methodology, theories, and conceptualizations necessary for a well trained independent researcher.

Application: Applications are due February 1, June 1, and October 1. To access applications and instructions, visit http://grants.nih.gov/training/careerdevelopmentawards.htm

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Mentored Patient-Oriented Research Career Development Award (K23)

Level: Junior Faculty

Award Information: Mentor-based; salary and some laboratory/research; 3-5 years support; amount depends on specific NIH institute

Description: The purpose of the Mentored Patient-Oriented Research (POR) Career Development Award (K23) is to support the career development of investigators who have made a commitment to focus their research endeavors on patient-oriented research. This mechanism provides support of supervised study and research for clinically trained

professionals who have the potential to develop into productive, clinical investigators focusing on patient-oriented research. Applicants must justify the need for a period of mentored research experience and provide a convincing case that the proposed period of support and career development plan will substantially enhance their careers as independent investigators in patient-oriented research.
Application: Applications are due February 1, June 1, and October 1. To access applications and instructions, visit http://grants.nih.gov/training/careerdevelopmentawards.htm

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VA Research Career Development Awards
Level: Junior Faculty. Citizenship now required for HSR&D application, at least Green Card for all others (but probably citizenship will be mandatory as well).
Award Information: Mentor based; salary and (minimal) laboratory/research support; salary support available for up to 2-5 years
Description: The Department of Veterans Affairs, Office of Research and Development, offers funding opportunities for scientists to develop their research careers through a structured mentored training experience. Awardees submit applications through their local VA research office to central office for peer review and funding decisions. The various award levels allow individuals at different points in their research career to obtain some protected time to devote to research, so that at the end of the award, they are able to compete independently for research funding. We are interested in supporting the early careers of scientists working on problems of importance to veterans' healthcare. This program has resulted in many clinicians and non-clinicians starting and establishing their VA research career.
Applications: Deadlines are variable. Please visit http://www1.va.gov/resdev/funding/CDP.cfm for more information.

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John A. Hartford Foundation Geriatrics Health Outcomes Research Scholars Awards Program
Level: Junior Faculty
Award Information: 4 awards annually; open to geriatricians, generalist physicians, neurologists, and psychiatrists; amount: $130,000 ($65,000/ year for two years).
Description: This program, which is funded by a grant from the John A. Hartford Foundation to the AGS Foundation for Health in Aging, supports physician-scientists committed to improving the health care of older adults during the critical transition from junior faculty to independent researcher.
Applications: Applications are usually available in August via the AGS Foundation for Health in Aging website, http://www.healthinaging.org/hartford/. The application deadline is December 7, 2007.

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T. Franklin Williams Career Development Award

Level: Junior Faculty (the level of assistant professor for no longer than four years at the time the grant becomes effective)
Award Information: one 2-year award available annually; $75,000 in project support over two years ($37,500/year); can hold other research career development awards simultaneously; must devote 75% of time to research
Description: T. Franklin Williams Awards are funded by a grant from the Atlantic Philanthropies and sponsored jointly by the AGS Foundation for Health in Aging from the Association of Subspecialty Professors (ASP). The T. Franklin Williams Scholars Award is for academic geriatricians who are conducting research on older patients that has applicability to the care provided by sub-specialists of internal medicine. The award must be matched by support (either from the applicant's home institution or a grant-making agency) that provides for 75% protected time for research.
Application: The application deadline is January 11, 2008. For more information visit: http://www.healthinaging.org/franklin_Williams/

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Pfizer Scholars Grants
Available grants include:
AASM/Pfizer Scholars Grants in Sleep Medicine
Pfizer Scholars Grants in Clinical Epidemiology
Pfizer Scholars Grants in Public Health
Level: Junior Faculty (within two years of becoming an instructor, an assistant professor, or an equivalent junior faculty rank at an accredited academic medical institution). Doctoral degree, relevant research experience, and postdoctoral clinical training appropriate for the proposed research are encouraged to apply.
Award Information: Up to two grants of $130,000 per award recipient are made on a competitive basis with grant payments typically beginning in July of each year for two years. Pfizer grants awards based on the recommendation of independent academic advisory boards. Visit each program page for a list of board members.
Description: Through Medical & Academic Partnerships (MAP), Pfizer is pleased to support the retention and promotion of talented physician-scientists through a number of Scholars Grants programs. These nationally competitive career development awards augment specialty training and encourage the development of senior faculty scientists.
Application: Applications are available online. The application deadline is usually in the beginning of January. For more information and to download application materials, visit: http://www.physicianscientist.com/GrantsEligibility.aspx?EligibilityID=1001

The Robert Wood Johnson Foundation (RWJF) Nurse Faculty Scholars Program
Level: junior faculty members with at least two but no more than five years of experience in a faculty role.
Award Information: The program will award up to $350,000 for three years to 15 scholars each year. Candidates who completed their doctoral degree within 10 years of receiving their initial nursing degree are encouraged to apply.
Description: The foundation will award $28 million to outstanding junior nursing faculty - over the next five years - to help them advance in their fields and seek faculty positions

earlier in their careers. Participants in the program will develop a research program and other academic activities, work closely with institutional and national mentors, and network with other scholars, experts, and colleagues in their field as well as related fields.
Application: Deadline: April 1, 2008. Please visit http://www.rwjf.org/ or http://www.rwjf.org/applications/solicited/cfp.jsp?ID=20021 for more information.

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Minority Career Development Awards

NIH Minority Supplement Award
Level: Junior Minority Faculty MDs and PhDs
Award Information: Mentor-based, $50,000/year for 3 years, for salary and research support. Duration can be more or less depending on mentor and parent grant (usually mentor has a RO1).
Description: This program, originally announced in 1989, was established to address the need to increase the number of underrepresented minority scientists participating in biomedical research and the health related sciences. The funding mechanism is through administrative supplements to existing grants for the support and recruitment of underrepresented minority investigators and students. The aim of these supplements is to attract and encourage minority individuals to enter and pursue health-related research careers in areas within the mission areas of all the awarding components of the NIH. Principal Investigators at domestic institutions who hold an active R01, R10, R18, R22, R24, R35, R37, P01, P20, P30, P40, P41, P50, P51, P60, U01, U10, U19, U41, U42 or U54 grant are generally eligible to submit a Request for an administrative supplement to the awarding component of the parent grant for any of the supplemental programs offered here. Principal Investigators holding an Academic Research Enhancement Award (R15), an Exploratory/Developmental Grant (R21) or a Small Grant Award (R03) also may apply for a supplement under this program. Grantees with support from these mechanisms MUST check with the appropriate awarding component before an application for a supplement is submitted.
Application: The application deadline is variable. For more information, visit: http://grants2.nih.gov/grants/policy/emprograms/overview/minority.htm

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The Harold Amos Medical Faculty Development Program (formerly: Minority Medical Faculty Development Program
Level: Junior Faculty
Award Information: four-year postdoctoral awards; annual stipend of up to $65,000 and a research stipend of $26,350; at least 70% of time devoted to research; up to 12 awardees a year
Description: The Harold Amos Medical Faculty Development Program was created by the Robert Wood Johnson Foundation to increase the number of faculty from historically disadvantaged backgrounds who can achieve senior rank in academic medicine and who will encourage and foster the development of succeeding classes of such physicians. Four-

year postdoctoral research awards are offered to historically disadvantaged physicians who are committed to developing careers in academic medicine, to improving the health of underserved populations, and to furthering the understanding and elimination of health disparities. Each Scholar will study and conduct research in association with a senior faculty member located at an academic medical center noted for the training of young faculty and pursuing lines of investigation that are of interest to the Scholar. Scholars are expected to spend at least 70% of their time in research activities.
Application: Applications are due in early March. For more information and to download application materials, visit: http://www.amfdp.org

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Fellow Awards

Ruth L. Kirschstein National Research Service Awards for Individual Postdoctoral Fellows (F32)
Level: Fellow
Award Information: Mentored award; this grant could be used to support the 2nd year of a geriatric fellowship. Awardees must devote 40 hours/week to research.
Description: The proposed postdoctoral training must be within the broad scope of biomedical, behavioral, or clinical research and must offer an opportunity to enhance the fellow's understanding of the health-related sciences and extend his/her potential for a productive research career. The proposed postdoctoral training must be within the broad scope of biomedical, behavioral, or clinical research and must offer an opportunity to enhance the fellow's understanding of the health-related sciences and extend his/her potential for a productive research career. Fellowship awardees are required to pursue their research training on a full-time basis. Research clinicians must devote full-time to their proposed research training and must restrict clinical duties within their full-time research training experience to activities that are directly related to the research training experience. A Kirschstein-NRSA fellowship (F32) may not be used to support studies leading to the M.D., D.O., D.D.S., D.V.M., or other similar health-professional degrees. N
Application: Applications are due: January 10, May 10, and September 10. For more information visit: http://grants2.nih.gov/grants/guide/pa-files/PA-03-067.html. Applicants are strongly encouraged to contact Dr. Robin Barr at the National Institute on Aging (NIA). Please Telephone: 301-496-9322 and Email: rb42h@nih.gov with any additional information concerning the areas of research, receipt dates, and other types of pre-application instructions.

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Research Grants

National Institutes of Health Director's Pioneer Award
Level: Scientists at any career level, including the early to middle stages
Award Information: between 5 and 10 awards expected in September 2008; $2.5 million in direct costs over 5 years ($500,000/year)

Description: The program supports scientists with innovative approaches to major challenges in biomedical research. Eligible applicants are scientists who are U.S. citizens, non-citizen nationals, or permanent residents currently engaged in a field of research, and willing to commit at least 51% of their research effort to the Pioneer Award Project. Women, members of groups that underrepresented in biomedical research and individuals in the early to middle stages of their careers, are especially encouraged to apply.
Application: Applications period opens on December 16, 2007 and closes on January 16, 2008; Applications are accepted in December and January; exact dates announced each year. Please visit http://nihroadmap.nih.gov/pioneer for more information. Email questions to pioneer@nih.gov.

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National Institutes of Health New Innovator Award
Level: new investigators who have received a doctoral degree or completed medical internship and residency within the past 10 years
Award Information: up to 24 awards expected in September 2008; $1.5 million in direct costs over 5 years
Description: This award is open to new investigators who have not yet obtained an NIH R01 similar grant, hold a research position at a US Institution, and agree to commit at least 25% of their research effort to the project.
Application: Deadline: March 31, 2008. Please visit http://grants.nih.gov/grants/new_investigators/innovator_award for more information. Email questions to newinnovator@nih.gov.

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The Agency for Health Care Research and Quality's Exploratory/Developmental Award
Level: organizations that will do exploratory research studies
Award Information: AHRQ has $3.7 million for awards up to $200,000. Eligible applicants are federal, state county or city governments, institutions of higher education, public housing authorities/Indian housing authorities, independent school districts, Native American tribal governments, and faith-based or community-based organizations.
Description: The grant is designed to expand the understanding of how to optimize decisions about preventive care and management of chronic diseases in complex patients especially in primary care. Exploratory research studies will contribute evidence to help guide the appropriate integration (i.e., prioritization, timing, provision and coordination) of therapeutic and preventive services in individuals with multiple chronic conditions. This information should help clinicians better integrate care provided to such individuals, help patients make informed decisions about health care choices, and help policy makers identify better ways to measure and promote quality care for complex patients.
Application: Deadline for letters of intent: November 2, 2007; Deadline: November 29, 2007. Please visit http://grants.nih.gov/grants/guide/rfa-files/RFA-HS-08-003.html for more information.

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The Bill & Melinda Gates Foundation's Grand Challenges Explorations
Level: Any researcher
Award Information: Projects selected for funding will receive approximately $100,000 each, and those that are successful will be eligible for additional funding.
Description: The Bill & Melinda Gates Foundation has made a five-year, $100 million commitment to promote and accelerate the discovery of new technologies to improve global health. The initiative aims to encourage scientists worldwide to explore creative, unorthodox ideas that could lead to major breakthroughs against some of the greatest health challenges facing poor countries. Specific topics are being determined, but in general the research should lead to new vaccines, diagnostics, drugs, and other technologies targeting diseases that claim millions of lives every year. It is likely that the topics will vary over time, to cover the range of innovation needs in global health.
Application: The call for proposals will be announced during the first half of 2008, with grants to be awarded multiple times a year on a rolling basis, with each funding round addressing specific topics or themes. More instructions and application instructions will be posted on the Grand Challenges in Global Health website located at http://www.gcgh.org/channels/gcgh.

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AFAR Ellison Medical Foundation/AFAR Postdoctoral Fellows in Aging Research Program
Level: Postdoctoral fellows (both MDs and PhDs)
Award Information: up to fifteen one-year awards ranging from $44,850 to $58,850
Description: The program was developed to address the current concerns about an adequate funding base for postdoctoral fellows (both MDs and PhDs) who conduct research in the fundamental mechanisms of aging. Postdoctoral fellows at all levels of training are eligible.
Application: Deadline: December 17, 2007. Visit http://afar.org/grants.html for more information or contact at grants@afar.org with questions.

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AFAR Research Grants
Level: Junior Faculty
Award Information: up to $60,000 for one- to two-year awards
Description: The AFAR grant supports junior faculty (MDs and PhDs) to do research that will serve as the basis for longer term research efforts. AFAR-supported investigators study a broad range of biomedical and clinical topics including the causes of cellular senescence, the role of estrogen in the development of osteoporosis, the genetic factors associated with Alzheimer's disease, the effects of nutrition and exercise on the aging process, and much more.
Application: Applications are due December 15 with awards starting in July of the following year. For more information and to download application materials, visit: http://www.afar.org/grants.html

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The Pfizer/AFAR Innovations in Aging Research Award Program

Level: Junior Faculty

Award Information: junior faculty scientists; requires US citizenship or permanent resident status; $150,000 in first year (total) plus $50,000 in 2nd year

Description: Provides support for promising junior faculty scientists who wish to start highly innovative projects focused on the basic biology of aging and its relationship to human disease. Applicants must hold an MD, DO, DVM, and/or PhD degree and be a US citizen or permanent resident of the United States. Applicants must have a junior faculty appointment (Instructor, Assistant Professor or their equivalents), and must demonstrate an established independent research program. Six awards are funded per year. Candidates who submit an application for the AFAR Research Grant program cannot also submit an application for the Pfizer/AFAR Innovations in Aging Research program.

Application: Applications are due December 15 with awards starting in July of the following year. For more information and to download application materials, visit: http://www.afar.org/grants.html

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NIA Pilot Research Program (R03)

Level: Small grant support is for new projects only; Small grant support may not be used for thesis or dissertation research

Award Information: $ 50,000/yr for 1-2 yrs. Funds cannot be used to cover PI's salary.

Description: The National Institute on Aging (NIA) is seeking small grant (R03) applications in specific areas to: (1) stimulate and facilitate the entry of promising new investigators into aging research, and (2) encourage established investigators to enter new targeted, high priority areas in this research field. This Small Grant (R03) Program provides support for pilot research that is likely to lead to a subsequent individual research project grant (R01) and/or a significant advancement of aging research.

Application: Electronic applications are due in early June. For more information and to download application materials, visit: http://grants.nih.gov/grants/funding/r03.htm.

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NIH/NIA Exploratory/Developmental Research Grant Award (R21)

Level: Research projects

Award Information: Funding up to two years with total direct costs up to $275,000; no preliminary data is required but may be included if available; budgets in modular format

Description: The R21 mechanism is intended to encourage new, exploratory and developmental research projects by providing support for the early stages of their development. All investigator-initiated exploratory/developmental grant applications described in this announcement will be assigned to ICs according to standard PHS referral guidelines and specific program interests. Applications that are assigned to non-participating ICs may be returned to the applicant. Such projects could assess the feasibility of a novel area of investigation or a new experimental system that has the potential to enhance health-related research. These studies may involve considerable risk

but may lead to a breakthrough in a particular area, or to the development of novel techniques, agents, methodologies, models or applications that could have major impact on a field of biomedical, behavioral, or clinical research.
Application: Electronic applications are usually due in early June. The application is 15-pages and in modular budget format. Please visit, http://grants.nih.gov/grants/funding/r21.htm for more information.

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Loan Forgiveness

NIH Loan Repayment Programs
Level: Doctoral Level
Award Information: In exchange for a two-year commitment to your research career, NIH will repay up to $35,000 per year of your qualified educational debt, pay an additional 39% of the repayments to cover your Federal taxes, and may reimburse any state taxes that result from these benefits.
Description: NIH Loan Repayment Programs are a vital component of our nation's efforts to attract health professionals to careers in clinical, pediatric, health disparity, or contraceptive and infertility research. Basic eligibility requirements: doctoral-level degree, government research funding (federal, state or local) or domestic nonprofit research funding, student loan debt equal to at least 20% of annual salary, U.S. citizenship or permanent residency, non-Federal government job. So far, those with VA Career Development Awards are not eligible because of Federal employee status.
Application: Applications are available via the NIH Loan Repayment Programs page: http://www.lrp.nih.gov/HomePage.aspx. The online application is good until June 2008. Applications open in September of each year and winners are announced between June and September of the following year.

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Other Sources of Funding

The Donald W. Reynolds Foundation
Level: allopathic medical schools and accredited osteopathic medical schools
Award Information: The Reynolds "Aging and Quality of Life Program" 4-year grants, of roughly $2 million each, are being awarded to a fourth cohort of 10 academic centers.
Description: The Reynolds grants support comprehensive projects and initiatives that improve geriatrics training for medical students, residents, and practicing clinicians in all specialties. To avoid duplication of effort and expense, applicants will be required to devote at least 10% of each year's budget to previous grantees, to provide for consulting and technical assistance in implementing programs or products already developed.
Application: Deadline for letters of intent: February 1, 2008; and proposals, July 1, 2008. Reverse site visits for finalists will be scheduled September 22-25, 2008. Grants will begin January 1, 2009. Please visit http://www.dwreynolds.org/Programs/National/Aging/AboutAging.htm for more information.

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The John A. Hartford Foundation and the American Geriatrics Society (AGS) Geriatrics-for-Specialists Initiative (GSI)

Level: any surgical specialists who treat geriatric patients

Award Information: Up to 25 two-year grants of $20,000 per year will be awarded to institutions that demonstrate in their proposals the most promise for success. No funds will be provided in support of indirect costs.

Description: Specialty-specific initiatives from training centers to develop, initiate, and evaluate programs designed to increase education for residents in the geriatrics aspect of their disciplines. Target specialties include: Anesthesiology, Emergency Medicine, General Surgery, Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Physical Medicine and Rehabilitation, Thoracic Surgery, and Urology.

Application: Deadline for mentor request: November 2, 2007. Deadline for receipt of completed applications: March 2, 2008. For additional information, please visit http://www.americangeriatrics.org/specialists/.

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The Investigators in Pathogenesis of Infectious Disease Program

Level: Junior Faculty (Assistant Professor Level)

Award Information: U.S. and Canadian Scientists only; 2005-2006 award level was $400,000/five years ($80,000/year)

Description: The program description provided here is for the 2005-2006 program. The Burroughs Wellcome Fund is currently developing guidelines for the 2006-2007 program and these will be available on its website in mid-June. The Investigators in Pathogenesis of Infectious Disease program provides opportunities for assistant professors to bring multidisciplinary approaches to the study of human infectious diseases. This award provides $400,000 over a period of five years ($80,000 per year). The goal of the program is to provide opportunities for accomplished investigators still early in their careers to study the pathogenesis of infectious disease at its most fundamental level-the points where human and microbial systems connect. The program supports research that sheds light on overarching problems in this encounter: how colonization, infection, commensalisms, and other relationships play out at levels ranging from molecular interactions to systemic ones.

Application: Applications for the 2007-2008 awards cycle will be available in mid-June at: http://www.bwfund.org/programs/infectious_disease/pathogenesis_background.html. Applications are usually due in the beginning of November.

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The Burroughs Wellcome Fund: Career Awards at the Scientific Interface

Level: Advanced Postdoctoral Training/Junior Faculty

Award Information: $500,000 over five years to support up to two years of advanced postdoctoral training and the first three years of a faculty appointment (no indirect costs); grants must be made to degree-granting institutions in the United States or Canada on behalf of the award recipient (during the postdoctoral and faculty periods); honorees must

devote at least 80 percent of their time to research-related activities. Candidates must hold a Ph.D. degree in one of the fields of mathematics, physics, chemistry (physical, theoretical, or computational), computer science, statistics, or engineering. Exceptions will be made only if the applicant can demonstrate significant expertise in one of these areas, evidenced by publications or advanced course work

Description: The grants are intended to foster the early career development of researchers with backgrounds in the physical/computational sciences whose work addresses biological questions and who are dedicated to pursuing a career in academic research. Candidates are expected to draw from their training in a scientific field other than biology to propose innovative approaches to answer important questions in the biological sciences. Examples of approaches include, but are not limited to, physical measurement of biological phenomena, computer simulation of complex processes in physiological systems, mathematical modeling of self-organizing behavior, building probabilistic tools for medical diagnosis, developing novel imaging tools or biosensors, applying nanotechnology to manipulate cellular systems, predicting cellular responses to topological clues and mechanical forces, and developing a new conceptual understanding of the complexity of living organisms. Proposals that include experimental validation of theoretical models are particularly encouraged.

Application: For more information and to access applications and instructions, please visit: http://www.bwfund.org. Applications are usually due in the beginning of May of each year. The fund will only accept electronic applications via proposalCENTRAL.

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Charles E. Culpeper Scholarships in Medical Science

Level: Junior Faculty (Assistant Professor)

Award Information: $108,000 per year for up to three years; U.S. citizens or aliens who have been granted permanent U.S. residence (proof required); must have a MD degree from a U.S. medical school or the equivalent of an M.D. degree from an educational institution equivalent to a United States medical school; applicants must have at least one year of post-doctoral clinical training. Must be an assistant professor and can not be promoted to Associate Professor before the onset of the award. Only one candidate may be nominated per institution.

Description: Funded by Goldman Philanthropic Partnerships and the Rockefeller Brothers Fund, the objective of these awards is to provide United States medical schools or equivalent United States educational institutions support, on behalf of candidates, including salary and core research expenses, on behalf of carefully selected physician scientists of high potential achievement who are committed to careers in academic medicine.

Application: Applications are usually made available in the beginning of the year. For more information and to access applications and instructions, please visit http://www.goldmanpartnerships.org/Culpeper/Culpeper%20Medical%20Scholars%20Info.htm. Application deadline is usually mid-August of each year.

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Charles E. Culpeper Biomedical Pilot Initiative

Level: Applicants may include young investigators seeking to establish independent directions or established investigators pursuing new directions.
Award Information: Grants of up to $25,000 will be made on a one-time basis with the possibility for renewal for a second year upon re-application; no more than eight percent (8%) of the grant may be allocated to cover indirect costs; nonprofit health care organizations, accredited medical schools, and universities in the United States
Description: The Initiative is designed to encourage the investigation of novel ideas that further Goldman Philanthropic Partnerships interest in cures for disease, particularly in the areas of molecular genetics, bio-engineering, and molecular pharmacology. Research into complimentary and alternative medicine will also be considered. The purpose of these grants is to explore new and even untested hypotheses, thus substantial preliminary information is not required. These Pilot Grants could be viewed as "venture capital" investments that should lead to greater funding opportunities through traditional sources.
Application: There is no application form for this program or submission deadlines for application. Proposals are accepted throughout the year and each successful proposal will be funded generally within four months of receipt. For more information and to access applications and instructions, please visit http://www.goldmanpartnerships.org/Culpeper/Culpeper%20Biomedical%20Pilot%20Initiative%20grants.htm

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The Robert Wood Johnson Scholars in Health Policy Research Program
Level: New PhDs in economics, political science, and sociology to advance their involvement in health policy research.
Award Information: Up to 12 awards given annually for the two-year fellowship; Green Card or citizen; must have received a doctoral degree in Economics, Political Science or Sociology; preference will be given to applicants who have not previously worked in the areas of health or health policy research
Description: The Scholars in Health Policy Research Program is intended to help develop a new generation of creative thinkers in health policy research within the disciplines of economics, political science and sociology. Honorees will spend two years at one of three nationally prominent universities - Harvard University, the University of California at Berkeley (in collaboration with the University of California at San Francisco), and The University of Michigan with the expectation that they will seek to make important research contributions to future health policies in the United States.
Application: Please visit http://www.healthpolicyscholars.org in the spring of each year for information on the next application season and application deadlines.

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The Robert Wood Johnson Health & Society Scholars Program
Level: MD; completion of doctoral training
Award Information: Up to 18 awards given annually; recipients must have completed doctoral training; must be willing to relocate; stipends are provided of $77,000/year 1 and $80,000/year 2; scholars will have access to a full range of university resources, plus health insurance from their university site. Scholars additionally will have access to

financial support for research-related expenses, training workshops and travel to professional meetings.

Description: Awards provide an intensive two-year interdisciplinary program in population health at one of six nationally prominent universities (Columbia, Harvard, University of California: San Francisco and Berkeley, University of Michigan, University of Pennsylvania, University of Wisconsin). Application is open to outstanding individuals who have completed doctoral training in one of a variety of disciplines, ranging from the behavioral and social sciences to the biological and natural sciences and health professions. Applicants are expected to have significant research experience. Past training in health-related areas is not a requirement, but applicants must clearly connect their research interests to substantive population health concerns.

Application: Applications are usually made available online in mid-July. For more information and to access applications and instruction, please visit http://www.healthandsocietyscholars.org. Application deadline is usually in mid-October. Award winners usually enter the program in August or September of the following year.

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About the AGS Junior Faculty Special Interest Group

The AGS Special Interest Group (SIG) for Junior Research Faculty Development seeks to disseminate information and provide support to junior faculty who are pursuing a research career in academic geriatrics (including clinical, basic science, epidemiology, public policy and health services research). For more information, contact: Ursula Braun, MD MPH (Chair) ubraun@bcm.tmc.edu

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ProVation software named number one in Clinical Procedure Documentation category, KLAS Year-end Report

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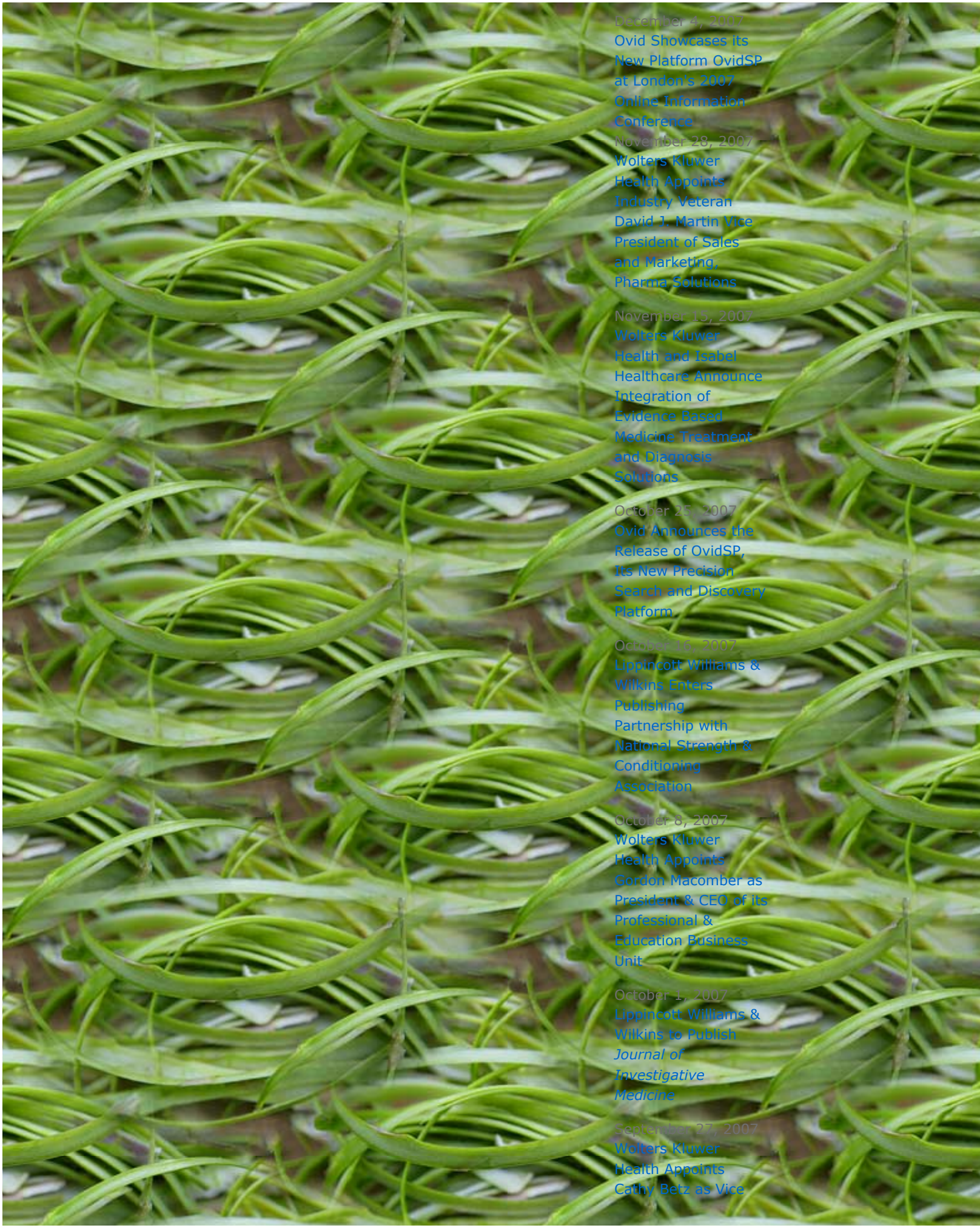
Quality Improvement Initiatives Lead To Progress In Diabetes Care



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Ovid Showcases its New Platform OvidSP at London's 2007 Online Information Conference

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Wolters Kluwer Health Appoints Industry Veteran David J. Martin Vice President of Sales and Marketing, Pharma Solutions

November 13, 2007
Wolters Kluwer Health and Isabel Healthcare Announce Integration of Evidence Based Medicine Treatment and Diagnosis Solutions

October 25, 2007
Ovid Announces the Release of OvidSP, Its New Precision Search and Discovery Platform

October 16, 2007
Lippincott Williams & Wilkins Enters Publishing Partnership with National Strength & Conditioning Association

October 8, 2007
Wolters Kluwer Health Appoints Gordon Macomber as President & CEO of its Professional & Education Business Unit

October 1, 2007
Lippincott Williams & Wilkins to Publish *Journal of Investigative Medicine*

September 27, 2007
Wolters Kluwer Health Appoints Cathy Betz as Vice

President, Government Affairs

September 19, 2007
Critical Pathways in Cardiology to Be Indexed by Index Medicus/MEDLINE

August 29, 2007
IMS Health, Wolters Kluwer Health and Verispan Challenge State Laws Restricting Access to Critical Healthcare Information

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Consumer and Physician Awareness of Nutrigenomic Tests Is Low

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Studies Reshape Gulf Region's Medical Planning for Natural Disasters

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Nursing2007 Critical Care Earns Best New Publication Bronze Award

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New Measurement Techniques Place Focus on Blood Volume

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Wolters Kluwer Health Appoints Mark Spiers as President & CEO of its Healthcare Analytics business

March 23, 2007
Elizabeth Thompson Named Editor-in-Chief of *OR Nurse 2007*

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Wolters Kluwer Health Releases *Integrated* Facts & Comparisons

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Ovid Expands Portfolio of Archive Content with BIOSIS Archive and Zoological Record Archive

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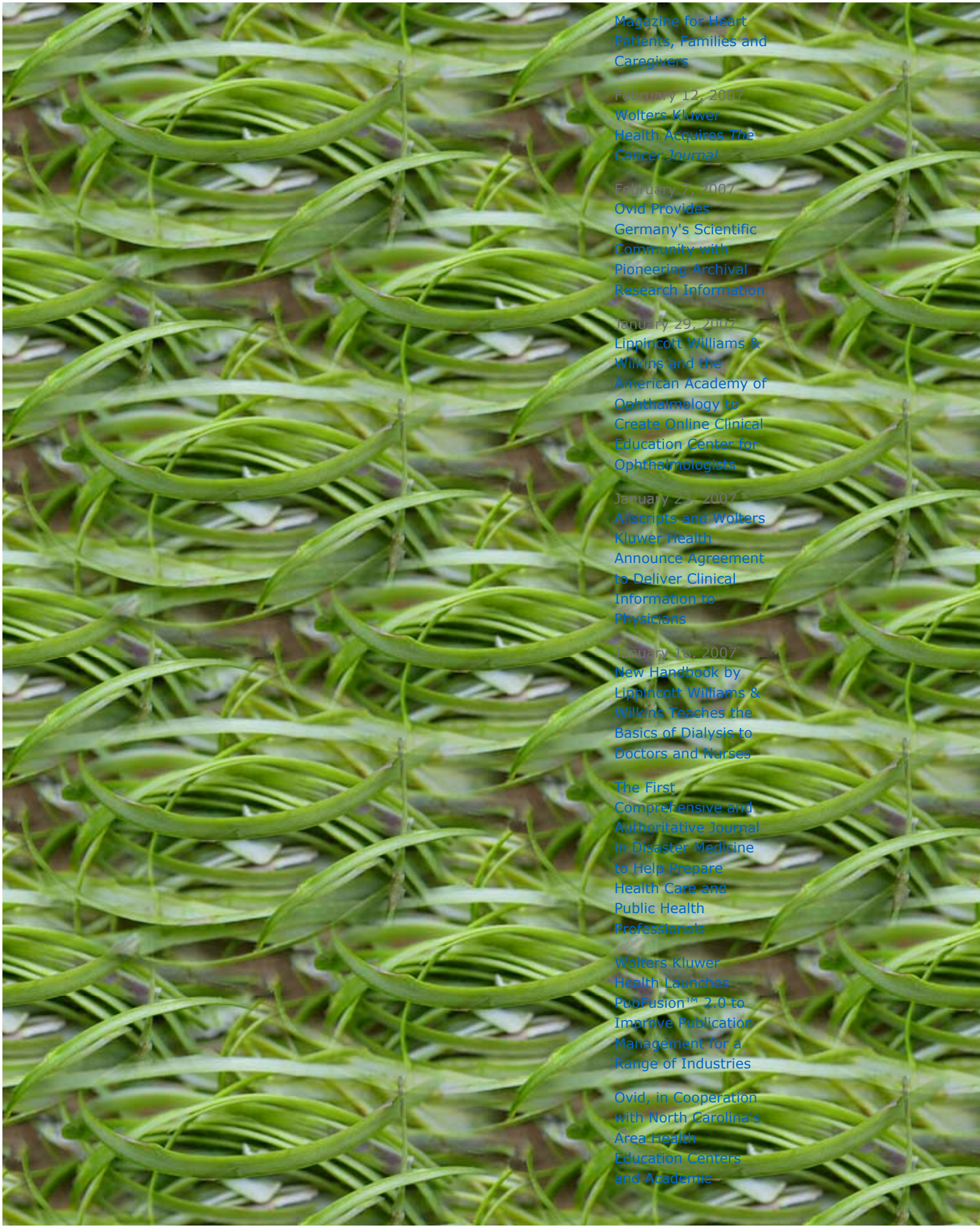
American Heart Association Launches



Magazine for Heart Patients, Families and Caregivers

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Wolters Kluwer Health Acquires *The Cancer Journal*

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Lippincott Williams & Wilkins and the American Academy of Ophthalmology to Create Online Clinical Education Center for Ophthalmologists

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Allscripts and Wolters Kluwer Health Announce Agreement to Deliver Clinical Information to Physicians

January 18, 2007
New Handbook by Lippincott Williams & Wilkins Teaches the Basics of Dialysis to Doctors and Nurses

The First Comprehensive and Authoritative Journal in Disaster Medicine to Help Prepare Health Care and Public Health Professionals

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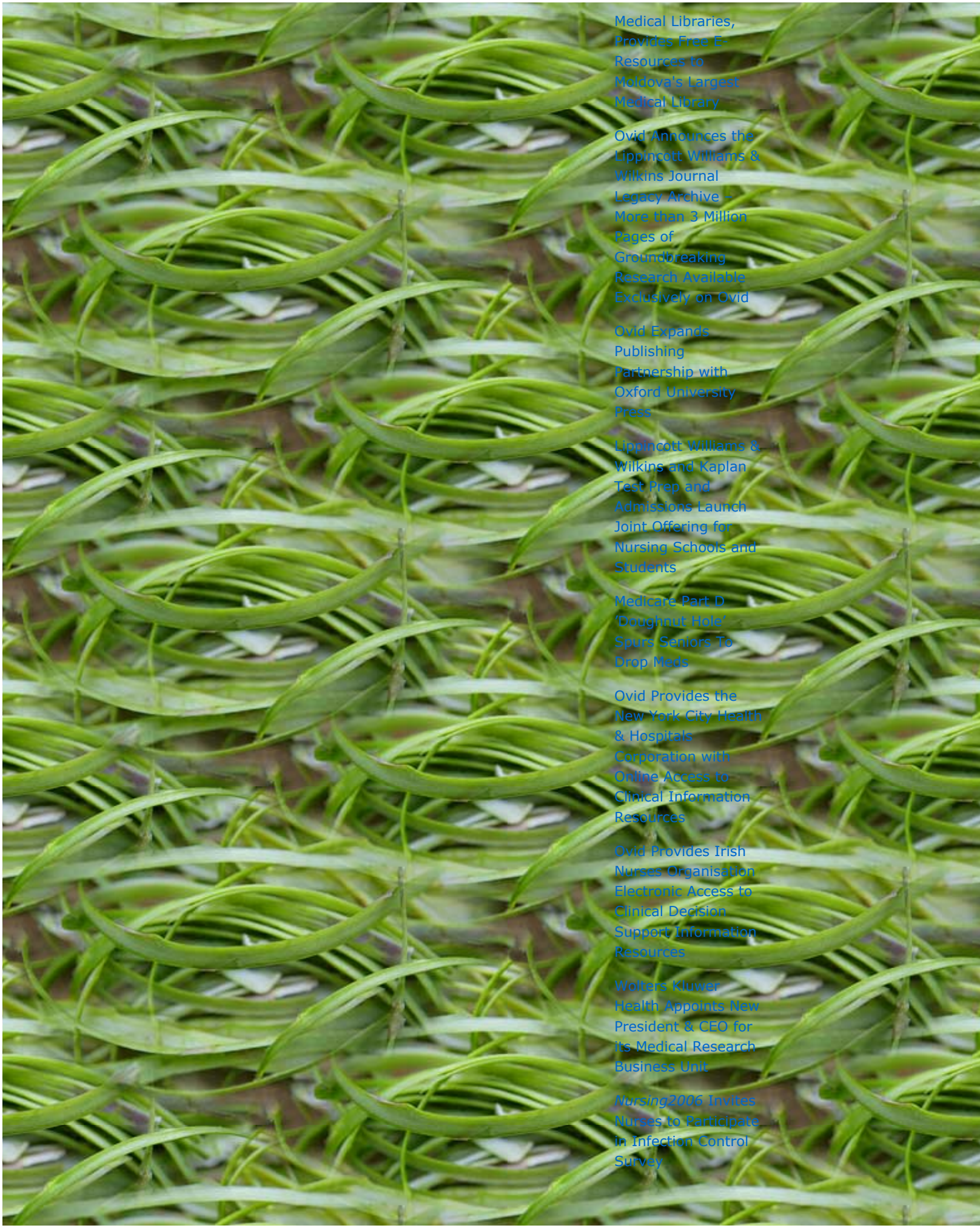

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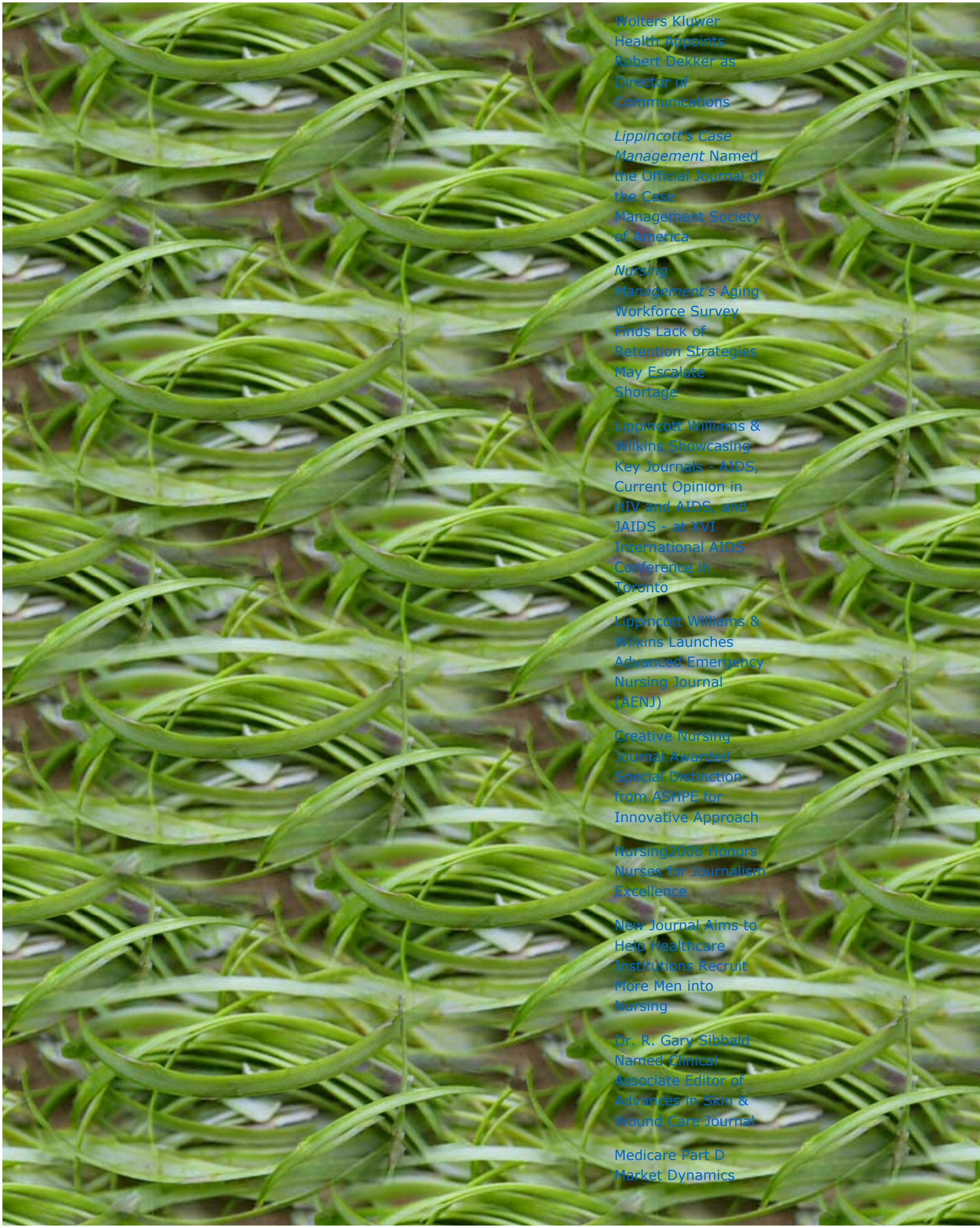

Wolters Kluwer Health Appoints Robert Dekker as Director of Communications

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Creative Nursing Journal Awarded Special Distinction from ASHPE for Innovative Approach

Nursing2006 Honors Nurses for Journalism Excellence

New Journal Aims to Help Healthcare Institutions Recruit More Men into Nursing

Dr. R. Gary Sibbald Named Clinical Associate Editor of Advances in Skin & Wound Care Journal

Medicare Part D Market Dynamics

Whitepaper: This Wolters Kluwer Health whitepaper examines the impact of Medicare Part D on payers, particularly in the areas of approvals, rejections and reversals during first quarter 2006, the first quarter of the program's existence.

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Nursing2006 Report Finds Positive Shift in Healthcare Culture Toward Reducing Medical Errors and Improving Patient Safety

AACN Advanced Critical Care: AACN to Introduce Redesigned Journal at NTI®

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Wolters Kluwer Health Releases Medi-Span Drug Information Bridge Application Programming Interface (API) Version 3.1

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Editor's Notepad

Welcome! As the new editor-in-chief of *Academic Medicine*, I will use this space to share information with our readers, to pose questions to our community, and to post solicitations for theme issues.

I hope you will find this Web site useful, and I look forward to hearing your ideas.

Steven L. Kanter, M.D.

I plan to use each year's January editorial to challenge the academic medicine community with a broad-based, thought-provoking, discussion-generating question that will help chart the course for the journal over the ensuing year. It is in this spirit that I invite all of you who have a stake in academic medicine to help shape the future direction and focus of the journal by responding to the 2008 Question of the Year.

2008 Question of the Year: "What are the grand challenges in academic medicine today?"

A "grand challenge" has been defined for a variety of disciplines in different ways, but generally means the statement of a problem that is thought to be solvable within a foreseeable time period (e.g., a decade, a century, or something in between) through the application of significant increases in knowledge and /or major breakthroughs in technical capability.

For our purposes, grand challenges should stimulate thought across the full spectrum of academic medicine: from fundamental precepts to far-reaching policy, from organ systems to sociocultural systems, from understanding our past to shaping our future.

View List of Grand Challenges *(PDF, 10 pages)*

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What are the grand challenges in academic medicine today?

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☐ 861 **The German Medical Dissertation-Time to Change?.**

Claudius Diez; Cord Arkenau, DrMed; Frierike Meyer-Wentrup, DrMed

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Prevention for the 21st Century: Setting the Context through Undergraduate Medical Education.

I. THE CONTEXT FOR PREVENTION EDUCATION

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S5-S13, July 2000.
Pomrehn, Paul R. MD, MS; Davis, Mary V. DrPH; Chen, D. W. MD, MPH; Barker, William MD

Abstract:
The generation of medical students now being taught will be practicing into the middle of the next century. They will be expected to provide an expanding array of clinical preventive services and be responsible for the health and well-being of entire populations and communities. Although prevention principles are being taught in many contexts, most medical schools do not have adequate curriculum-tracking systems that allow them to track the delivery of education and training in disease prevention and health promotion.

The Bureau of Health Professions of the Health Resources and Services Administration (HRSA) and the Association of Teachers of Preventive Medicine have worked on several projects that have culminated in the development of a set of core competencies in preventive medicine for undergraduate medical education. In 1997 they convened a task force of medical educators from a broad array of basic science and clinical disciplines representing major U.S. medical teaching societies. The task force reviewed and updated the 1984 Inventory of Knowledge and Skills Relating to Disease Prevention and Health Promotion so that it would be relevant to faculty in diverse specialty areas and could be integrated throughout the medical curriculum. They then created a list of competencies that are essential from the perspective of each discipline and all disciplines.

The article gives the context for teaching preventive medicine, presents the core competencies, and serves as the introduction to a supplement to Academic Medicine on teaching preventive medicine throughout the undergraduate medical curriculum.

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Prevention Education and Evaluation in U.S. Medical Schools: A Status Report.

I. THE CONTEXT FOR PREVENTION EDUCATION

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S14-S21, July 2000.
Garr, David R. MD; Lackland, Daniel T. DrPH; Wilson, Diane B. EdD, RD

Abstract:
The Prevention Curriculum Assistance Program (PCAP) was initiated to help U.S. medical schools examine the extent to which they are evaluating the learning of medical students about disease prevention/health promotion. A survey was sent to all 144 allopathic and osteopathic medical schools, with an overall response rate of 68%. The results revealed more emphasis on teaching and evaluating the learning of medical students in the areas of clinical preventive services and quantitative methods, and less emphasis on the community dimensions of medical practice and health services organization and delivery.

Written tests and unstructured observation are the most common methods of evaluation. Fewer than half of all respondents were satisfied with the quality of their assessment of student achievement in any of the four domains of prevention education. More than 30% expressed a desire to receive assistance with designing curricula and/or evaluation methods in each of the four content areas examined. Several indicated their willingness to assist colleagues who want to improve their prevention curricula and/or measurement strategies.

This study identified a need for more attention and support for prevention education and evaluation programs. Curriculum leaders can help by designating prevention a priority area and appointing faculty to be responsible for monitoring the content and quality of prevention teaching throughout the curriculum. Resources such as the Internet can be utilized to establish a network whereby medical schools can collaborate to improve their educational programs and evaluation methods in prevention.

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Preventive Medicine 2000: Changing Contexts and Opportunities.

I. THE CONTEXT FOR PREVENTION EDUCATION

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S22-S27, July 2000.
McClary, Alicia M. MS, EdD; Marantz, Paul MD, MPH; Taylor, Margaret H. MD, MBA

Abstract:
The teaching of preventive medicine in the medical school curriculum occurs both in independent and in interdisciplinary courses and units. A survey was conducted to examine the changes in preventive medicine context, content, and allotted hours that have occurred in the transition from the traditional Flexnerian curriculum to the more interdisciplinary, centrally controlled curriculum. Data on medical school curricula for 1990-91, 1993-94, 1995-96, and 1998-99 were examined for the 126 U.S. and 16 Canadian medical schools.

By 1998-99, 35 schools moving to the new interdisciplinary format had retained preventive medicine teaching as a separate course, although the courses usually had incorporated topics that went beyond the traditional ones. In another 35 schools, preventive medicine hours had been lost in the transition; but in 25 of these new courses it was clear that preventive medicine played a very significant role. It can be assumed that the lost hours were more than replaced as preventive medicine concepts permeated these courses. Of greatest importance were the hallmark courses of the six nontraditional curricula that had designated preventive medicine a major-theme course. However, at ten schools, preventive medicine listings disappeared in the move to nontraditional curricula.

Preventive medicine educators must step forward to use curricular restructuring to expand the role of preventive medicine in the curricula of their institutions, whether in stand-alone or in interdisciplinary courses. The goal, as always, is to provide future physicians with the knowledge and skills they need to provide proper care to their patients.

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Evaluation Methods for Prevention Education.

I. THE CONTEXT FOR PREVENTION EDUCATION

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S28-S34, July 2000.
Blue, Amy V. PhD; Barnette, J. Jackson PhD; Ferguson, Kristi J. PhD; Garr, David R. MD

Abstract:
The knowledge, skills, and attitudes associated with prevention cut across clinical disciplines. Thus, they are often subsets of disciplines not otherwise present in the traditional curriculum (e.g., epidemiology or statistics) or considered the province of many disciplines (e.g., risk reduction or cancer screening). Evaluation of elements of prevention education can often become lost in the myriad other outcomes that are assessed in students, or they are intermingled with other content and skills. This article highlights the value of assessing students' competence in prevention knowledge, skills, and attitudes, provides general guidance for programs interested in evaluating their prevention instructional efforts, and gives specific examples of possible methods for evaluating prevention education.

While it is important to tailor assessment methods to local institutional objectives, it is possible to share assessment methods and materials regionally and nationally. Sharing problems, as well as successes, encountered in developing appropriate assessment methods will advance the field of evaluation of prevention curricula.

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Faculty Development and Support Needed to Integrate the Learning of Prevention in the Curricula of Medical Schools.

I. THE CONTEXT FOR PREVENTION EDUCATION

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S35-S42, July 2000.
Sachdeva, Ajit K. MD

Abstract:
Comprehensive coverage of prevention-related topics in the curricula of medical schools is important for the training of future physicians; however, the changes needed in educational programs to include such topics are likely to challenge many institutions. Faculty members are central to the successful adoption of any new curricular paradigm, yet many of the impediments to change are also likely to be found within the faculty ranks. Achieving major curricular change requires institution leaders to define a new vision and allocate sufficient resources to support faculty efforts. Appropriate steps should be taken to actively involve the faculty early in the process of change and to recruit stakeholders from within the faculty ranks to play prominent roles. The educational models should be based on educationally and scientifically sound underpinnings that will facilitate acceptance of the models by the faculty, and faculty members must be offered appropriate opportunities to develop the skills to successfully implement the models. A school-wide faculty development program should address organizational development, instructional development, and personal development. The expertise needed to design and implement these activities may be secured from within or outside the institution. Individuals who have played key roles in the curricular change process must be rewarded and given appropriate recognition for their contributions. These steps will help in the successful integration of prevention-related topics into the curriculum, which will add a much-needed dimension, resulting in students' being better prepared to address the needs of their patients and the community.

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Communication Skills for Preventive Interventions.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S45-S54, July 2000.
Dube, Catherine E. EdD; O'Donnell, Joseph F. MD; Novack, Dennis H. MD

Abstract:
Effective communication relevant to preventive services and practices has at its basis the physician's skills in not only basic history taking and data collection but also relationship building, facilitation, negotiation, and partnership. These skills, fundamental to doctor-patient communication, are now routinely and systematically taught in many U.S. medical schools. This article defines and examines a communication model for enhancing the provision and adoption of preventive practices in the primary care setting and discusses teaching that model in the medical school context. Within the office visit, broad areas for communication tasks important to providing preventive services are defined as: (1) the medical interview and preventive counseling; (2) working with patients to change unhealthy behaviors, promote healthy behaviors, and enhance adherence; and (3) communication related to office procedures for screening and prevention. Within each of these areas, communication and counseling skills and approaches are defined, and examples of associated prevention activities are provided. Methods for integrating communication skills for prevention into the medical school curriculum are discussed, and examples at Dartmouth, Brown, and MCP Hahnemann medical schools are presented.

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Integrating Prevention Education into the Medical School Curriculum: The Role of Departments of Family Medicine.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S55-S59, July 2000.
Stine, Curtis MD; Kohrs, Francis P. MD, MSPH; Little, David N. MD; Kaprielian, Victoria MD; Gatipon, Betty B. PhD; Haq, Cynthia MD

Abstract:
Departments of family medicine-including departments of family and community medicine, departments of family and preventive medicine, and departments of family practice-at U.S. medical schools regularly participate in teaching prevention principles to students, using a variety of formats and methods. Required clinical experiences (i.e., clerkships and preceptorships), required nonclinical courses, and electives frequently include prevention content. Collaborative interdisciplinary clerkships, interdisciplinary nonclinical courses, and courses directed by other departments also enable family medicine faculty to teach prevention principles. This article describes examples of innovative educational programs in which family medicine faculty teach prevention content to medical students. Directions for future educational efforts by family medicine faculty in the prevention area are proposed.

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Teaching Prevention in Internal Medicine Clerkships.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S60-S65, July 2000.
Kinsinger, Linda MD, MPH

Abstract:
The teaching of prevention to students in internal medicine has come into much sharper focus in the past decade or so, and the ongoing development of a strong scientific base for clinical preventive services has led to broad acceptance of the principles and practice of prevention in internal medicine. This article reviews the rationale for including prevention in the clinical medicine clerkship, summarizes current guidelines, presents examples of curricula in several medical schools, and proposes a future direction for more fully integrating prevention teaching in the internal medicine clerkship into the rest of the medical school curriculum.

Internal medicine clerkships present many opportunities for teaching and learning about the broad scope of prevention, from individual preventive services to improving the health of groups of patients. But individual clinical clerkships cannot do the job in isolation from each other. More attention should be directed to coordinating the teaching of prevention among the clinical disciplines and across the entire four-year medical school curriculum, so that students graduating from medical school will leave with the thorough understanding they need to contribute to the health of the public in the health care system of the future.

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Teaching Prevention in Pediatrics.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S66-S71, July 2000.
Cheng, Tina L. MD, MPH; Greenberg, Larrie MD; Loeser, Helen MD; Keller, David MD

Abstract:
Pediatrics has attempted to inculcate the "culture of prevention" into practice, both through anticipatory guidance in well-child care and through behavioral interventions in sick care. The effectivenesses of many components of well-child care have not been conclusively demonstrated, particularly in health education, counseling, and anticipatory guidance, nor has teaching prevention in pediatrics been thoroughly evaluated. This article reviews methods of teaching prevention in pediatrics and highlights innovative programs. Teaching programs use the wide range of approaches now common in medical education, in a variety of inpatient and outpatient sites. Programs across the country are trying new approaches to teaching traditional topics or are introducing new topics into their curricula. Examples of specific programs are given, organized by the themes of the programs.

The field needs to develop in three major directions. First, there is a need to develop competencies and curricula in prevention issues of contemporary importance, including the new morbidities, cross-cultural issues, cost-effectiveness, quality of care, and practice in managed care and other community settings. Second, further work is needed to evaluate programs and measure educational outcomes. This feedback must in turn be used to redefine competencies, curricula, and programs, Third, there needs to be an accessible clearinghouse, and educational tools need to be disseminated.

To be effective, a curriculum for prevention in pediatrics cannot stand alone, but must be part of a vertically and horizontally integrated curriculum. Further, creating horizontally and vertically integrated curricula in prevention teaching across disciplines should be the standard.

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Integrating Prevention into Obstetrics/Gynecology.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S72-S76, July 2000.
Carey, J. Christopher MD

Abstract:
Obstetricians and gynecologists play an important role in preventive medicine. A great deal of obstetrics and gynecology is dependent on the principles of preventive medicine, such as understanding populations, risk profiling, epidemiology, and statistics as they pertain to screening programs and prevention. Thus, it is reasonable that an ob-gyn clerkship be an integral part of a program to teach preventive medicine in a medical school. This article presents information about formats used to teach preventive medicine in ob-gyn, illustrated by specific programs at medical schools across the country. It also provides information about publications that are useful for designing and creating programs in introduce and/or integrate preventive medicine into ob-gyn clerkships and other parts of the undergraduate medicine curriculum.

Obstetricians and gynecologists spend the majority of their time in the office, and most of their patient visits can be classified as preventive medicine visits. Medical students' education needs to reflect that focus. Among other things, ob-gyn must develop training directed toward students who do not intend to become obstetricians. A rotation in ob-gyn may be the only exposure a student has to health care that is specifically for women. Therefore, that clerkship must focus on preventive medicine for women as well as on treatment.

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Teaching Prevention in Surgery-Is It an Oxymoron?.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S77-S84, July 2000.
Wolfson, Philip MD

Abstract:
Although surgery is not often thought of as the optimal pathway to health, it nonetheless can play a key role in many facets of medical student education involving disease prevention. This article defines the scope of the surgeon's involvement in teaching disease prevention and health promotion to medical students, enumerates possible learning objectives that may be (and often already are) incorporated into their surgical education, and describes seven examples of programs that have used innovative methods to include prevention teaching in their surgery curricula.

There should be specific educational standards regarding prevention within the curriculum of each clinical specialty, and educational programs should be evaluated with outcome measures. Prevention teaching should not be performed differently and apart from current interventional teaching, but needs to be incorporated within it. Medical education occurs increasingly in outpatient settings. Even in the surgical disciplines, outpatient surgery and office hours are being incorporated increasingly into the clerkship experience. The resulting exposures to large numbers of patients with mostly early stages of surgical disorders afford excellent opportunities for surgeons to emphasize to both patients and students many of the important aspects of prevention.

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Teaching Prevention through Electives.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S85-S89, July 2000.
Eckhert, N. Lynn MD, DrPH; Bennett, Nancy M. MD, MS; Grande, David MD; Dandoy, Suzanne MD, MPH

Abstract:
The Liaison Committee on Medical Education (LCME) accreditation standards affirm that the medical school curriculum should include elective courses to supplement the required courses and provide opportunities for students to pursue individual academic interests. The breadth of opportunities in preventive medicine and population health is extensive as students seek rotations at health departments, rural and urban community health centers, community agencies, occupational health sites, schools, and abroad. A growing number of students choose to participate in MD/MPH dual-degree programs. This article describes four prototypes that foster student learning in preventive medicine: population health, international health, American Medical Student Association opportunities, and public health degree programs.

These four types of electives enable students to participate in the front lines of preventive services through experiential learning in: community and population health both at home and abroad, continuous quality improvement, organization and behavioral change, interprofessional teamwork, and health care policy. For those with particular interests in population health and preventive medicine, an increasing number of medical schools offer dual MD/MPH programs, either in conjunction with schools of public health or in graduate programs in public health.

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Putting It All Together: Building a Four-year Curriculum.

II. IMPORTANT SPECIFIC CONTEXTS FOR INCORPORATION OF PREVENTION CONCEPTS

Academic Medicine. Teaching Prevention Throughout the Curriculum: Multidisciplinary Perspectives on Enhancing Disease Prevention and Health Promotion in Undergraduate Medical Education. Sponsored by the Association of Teachers of Preventive Medicine and the Health Resources and Services Administration.. 75(7) Supplement:S90-S92, July 2000.
Dismuke, S. Edwards MD, MSPH; McClary, Alicia M. MS, EdD

Abstract:
A four-year curriculum in preventive medicine would require planning, but all the components are already available. This article outlines a four-part plan: develop the desired objectives or competencies; present the basics in years one and two of the curriculum; in years three and four make health promotion/disease prevention (HPDP) and the population perspective relevant to the practice of medicine; and, finally, develop a mechanism to track the curriculum and then improve it.

Core competencies have already been developed, through joint activities of the Association of Teachers of Preventive Medicine (ATPM) and the Bureau of the Health Professions of the Health Resources and Services Administration (HRSA), and articles about teaching preventive medicine in multiple disciplines throughout the curriculum are published elsewhere in this supplement. Schools across the United States and Canada have innovative programs in place that can serve as models, and there are feasible approaches to monitoring the programs.

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Interest Group Opportunities

AMSA Interest Groups:

AMSA Opportunities

1. New Preventive Medicine Specialty Forum

A new Specialty Forum was created at the National Convention this year; Preventive Medicine is the newest AMSA SF group. AMSA Interest Groups (IGs) are collections of AMSA members who share a similar interest and Specialty Forums were created to denote IGs with an academic focus.

We're looking for motivated students interested in preventive medicine. If you would like to get involved on the ground floor, join the listserve or possibly serve in a leadership position for the Preventive Medicine Specialty Forum.

Visit the AMSA Web site at
or contact the *Director of Student Programming* at
or call 1 (800) 767-2266, ext. 270.

Other Opportunities

1. **American Holistic Medical Association 2008 Art & Science of Health Promotion Conference.**
   "Maximizing ROI in Health Promotion: Improving Health, Reducing Costs"

   Intensive Training Seminars:
   March 3-4 and **March 8, 2008**
   San Diego Convention Center| San Diego, CA

   Online Registration Form:
   register before February 28, 2008 for discounted fee.

   Visit the **AHMA website** today for complete details!

2. **Boston University Summer Institute in Geriatric Medicine:**

www.bmc.org/geriatrics/educationMedicalStudents_SIGM.htm

3. **The American Foundation for Suicide Prevention** -
   contains award information & description of
   AFSP research grants.
   http://www.americangeriatrics.org/funding/sig_funding.shtml#afsp

   Application:
   Deadline: December 15, 2007 and June 15, 2008.
