



# **Inventory of Knowledge and Skills Relating to Disease Prevention and Health Promotion**

A guide for curriculum planners to ensure that medical students are introduced to the range of topics and basic skills in prevention and health promotion appropriate for medicine in the coming decades

## Introduction

Plans for reform of the U.S. health system emphasize the importance of promoting good health and preventing disease as crucial elements for better use of scarce resources. As competition for health resources increases, the central importance of prevention must be emphasized. Preventive services are the most cost effective measures to improve the health of populations, especially those at high risk of disease because of poverty or ignorance, lack of education or skills to alter unhealthy behaviors, or shortage of appropriately trained health professionals.

The Association of Teachers of Preventive Medicine, recognizing increased emphasis on disease prevention and health promotion in the training of physicians, assembled a group of members to articulate the basic prevention content of a comprehensive medical education curriculum. The need for an inventory to assist academic units having responsibility for teaching prevention and health promotion within medical schools became apparent with the documentation of marked diversity in their curricular offerings.<sup>1,2</sup> Even the names and departmental locations of the academic units within medical schools with responsibilities for teaching in these areas have lacked recognizable consistency. Names include preventive medicine, community medicine, social medicine, and many others.<sup>3</sup> Organizational locations include departments at the preclinical and clinical levels and divisions or sections within other departments, e.g. internal medicine and family medicine. The range of responsibilities is likewise remarkably varied, undoubtedly reflecting complex individual institutional histories. The heterogeneity of organization and content has been so widespread that the field of prevention has suffered diffusion of definition and identity to the point where responsibility for many of its component elements has risked being lost altogether.

The inventory is the cumulative product of a steering committee within the Association of Teachers of Preventive Medicine, which began work in 1985 with funding under a cooperative agreement with the Centers for Disease Control. The committee elicited input and comment from fifty-one practitioners and teachers involved in clinical prevention. The resulting first edition of the inventory was distributed widely to teachers of preventive medicine and others.<sup>4</sup> It was also the subject of full public discussion at the 1988 annual national preventive medicine meeting, PREVENTION 88, and revisited at PREVENTION 89, in light of its special relevance to implementation of the 1988 Institute of Medicine report, *The Future of Public Health*<sup>5</sup>, which called for a recommitment to physician leadership in public health. Further comment was obtained from representatives of the various primary care specialties, and drafts of a revised edition were reviewed by a panel of twenty-one practitioners and others in the field of prevention. The inventory was again reviewed and revised in 1994.

The inventory is intended as a guide for curriculum planners to ensure that medical students are introduced to the range of topics and basic skills in prevention and health promotion appropriate for medicine in the coming decades. It attempts to define the breadth of these areas appropriate for the general education of all physicians. It is not intended to be exhaustive. Being an inventory only, it does not specify depths of understanding or levels of proficiency. Nor does it specify the amounts of curricular time needed or the educational/learning approaches to be used.

Although the inventory was drafted with academic units of preventive and community medicine in mind, it is fully recognized that the responsibility for teaching will be shared across many disciplines. Indeed, success in learning the precepts and in using the skills will require both understanding of the underlying basic disciplines and application across a variety of clinical disciplines and situations, with extensive opportunity for their reinforcement. The teaching, of necessity, will involve academic departments beyond those specifically focused on prevention and community medicine. As the pace of restructuring the American health care system and the emphasis on primary care delivery increase, so will the mandate for producing a modern and relevant prevention curriculum. One of the challenges to teachers within the disciplines of prevention and community and social medicine is to ensure such integration.

## Attitudes and Philosophy

Basic attitudes held or acquired by medical students during their undergraduate medical education can determine acceptance and later application of the knowledge and skills included in this inventory.

As a prologue to the inventory of knowledge and skills, the statements below attempt to delineate attitudinal viewpoints pertinent to disease prevention and health promotion and in most instances to all medical practice. The fundamentals include:

1. A medical care philosophy that:
  - acknowledges that value of disease prevention and health promotion as components of medical care ncludes understanding of health issues and problems that relate to population groups as well as to individuals.
2. Definition of the physician's responsibilities in disease prevention and health promotion to include:
  - serving as a role model for patients and others in applying principles of prevention to personal behavior patterns;
  - viewing each patient in his or her entirety;
  - carrying out strategies that consider how patients interact with their social and cultural environments, families, and work environments, and that reflect behaviors and attitudes rooted in the patients= particular backgrounds, age groups and socio- economic status;
  - addressing the full range of issues and problems relevant to health and safety (for example: exposure to toxic substances, violence, drunk driving, non-use of seatbelts);
  - identifying the major preventive care issues facing the particular population being served;
  - being aware of and, whenever appropriate, developing productive partnerships with the full range of individuals and groups concerned with disease prevention and health promotion, including other health professionals, official health agencies, community-based health organizations, and the media.
3. A scientific approach to disease prevention and health promotion including:
  - lifelong habits of rigorous critical thinking; the critical appraisal of methods and findings of published biomedical and epidemiological research;
  - evaluation and modification of prevention strategies used in one=s own practice, in response to available data.
4. Informed awareness of major ethical issues confronting physicians today, such as:

- the physicians' obligation and loyalty to patients versus to other individuals and groups such as health service administrators, group practice colleagues, patients= employers, and government regulatory agencies;
- the prerogatives of patients and their families to participate in choices about use of available therapeutic measures, including life support systems;
- the effect of social interventions on quality of health care;
- the relevance of intercultural considerations in the provision of health care.

## Knowledge and Skills

Inclusion of disease prevention and health promotion content in undergraduate medical education may occur throughout the undergraduate medical years, in various portions of any particular school's curriculum. It should extend far more widely than courses designed specifically to teach preventive medicine and should be an integral part of clinical clerkships.

Statements of knowledge and skills set out on the following pages are organized by four subject areas:

- A. Clinical Prevention (delivery of personal disease prevention/health promotion services)
- B. Quantitative Methods
- C. C. Health Services Organization and Delivery
- D. D. Community Dimensions of Practice.

### Clinical Prevention: Delivery of Personal Disease Prevention/Health Promotion Services

The sets of knowledge and skills statements in this section relate to health and risk assessments, disease prevention/health promotion interventions, and aspects of physician-patient interaction necessary for integration of disease prevention and health promotion into day-to-day clinical practice.

For purposes of this inventory, clinical preventive medicine, as applied in practice, is defined as Athose personal health services, provided within the context of clinical medicine, the purpose of which is to maintain health and reduce the risk of disease and untimely death.<sup>6</sup> The fundamentals include:

1. Knowledge of health and risk assessment, based on:
  - the concept of health status as an estimate of the state of an individual's health derived from one or more anatomic, functional, adaptive, and subjective indices;<sup>6</sup>
  - the concept of risk status as an estimate of the state of an individual's risk determined from data on genetic inheritance, environmental exposures, health habits, and by identifying unrecognized, asymptomatic conditions and diseases known to increase the risk of illness and untimely death;<sup>6</sup>
  - other basic scientific concepts, such as the range of normal and multiple causation of disease, that apply to health and risk assessment;
  - scientific data on causation of preventable handicaps, illness, and injury, e.g. low birthweight, infectious diseases, motor vehicle and other accidental injuries, chronic diseases, nosocomial infections and iatrogenic illnesses;
  - the major factors known to affect life expectancy, and their relationship to survival as well as to morbidity and mortality, with recognition that the lack of data on morbidity related to specific diseases and conditions creates an important gap in our knowledge;
  - the major risk factors for:

- the most important diseases as judged by their clinical and social impact, e.g. heart disease, cancer, stroke, sexually transmitted diseases, dysfunction related to alcohol and drug abuse;
- other important diseases and conditions that cause preventable morbidity and mortality.

In addition, skills should be developed in:

- application of general principles of case-finding, selective screening, and mass screening;
- use and interpretation of the health risk appraisal, including understanding its limitations;
- development of health and risk status profiles from a patient's historical database, including family history, health history, habits and exposures;
- conduct of a rational, age-specific periodic health examination to include screening tests, counseling, and immunization/chemoprophylaxis:<sup>7</sup>
- recognition of the ethical issues associated with case-finding and screening programs, including at least the potential negative effects of labeling, false positive and false negative tests, detection of untreatable conditions, and lack of follow-up of positive findings.

2. Knowledge of disease prevention and health promotion interventions based on:

- the concept of varying levels within the natural history of disease where preventive interventions can be focused;
- the concept of levels of prevention as: primary- an intervention having the purpose of reducing the risk of disease occurrence; secondary- an intervention having the purpose of either detecting asymptomatic, remediable disease, or reducing the risk of recurrence of disease; and tertiary- an intervention, used in the case of an individual with a recognized disease or a limiting condition, having the purpose of preventing or retarding progression of the disease or disability;
- the concept of varying levels of scientific evidence and extent of certainty regarding efficacy of preventive measures;
- the concept that there are diverse agents for effectuating preventive programs, including responsible personal behaviors, systematic programs delivered in the clinical setting, and structured social and environmental modifications;
- the concept of health promotion as interventions to enable individuals to control behaviors and circumstances that increase risks, and to maintain health at the highest levels consonant with genetic inheritance, age, and existing health;
- the concept of life cycle periods and applicability of various disease prevention/health promotion interventions for each age group.

In addition, skills should be developed in:

- achieving patient cooperation in formulation of disease prevention/health promotion interventions and in carrying out prescribed regimens;
  - monitoring patient cooperation and behavior modification.
3. Knowledge of physician-patient interaction, important to both assessment and intervention, based on understanding that:
- health behavior theory and strategies of modification of adverse health behaviors have direct applicability to disease prevention and health promotion;
  - patient education and counseling are integral components of clinical practice, and to provide them physicians need to recognize or learn about:

In addition, skills should be developed in:

- identifying and using other sources of patient education, e.g. hospital personnel trained to educate and counsel patients, and voluntary community agency literature and programs;
- maintaining systematic records and contacting patients to monitor progress in implementing the negotiated plans for intervention.
- health behavior theory and strategies of modification of adverse health behaviors have direct applicability to disease prevention and health promotion;
- patient education and counseling are integral components of clinical practice, and to provide them physicians need to recognize or learn about:
  - the central role of an effective partnership between physician and patient;
  - the patient's family and community support systems;
  - factors that influence patients either to adopt or fail to adopt disease prevention and health promotion practices;
  - behavioral factors in patient management and in patients' adherence to prescribed interventions;
  - necessary follow-up continuity of care, and assessment of outcomes;
  - relevance of intercultural differences.

In addition, skills should be developed in:

- identifying and using other sources of patient education, e.g. hospital personnel trained to educate and counsel patients, and voluntary community agency literature and programs;
- maintaining systematic records and contacting patients to monitor progress in implementing the negotiated plans for intervention.

## B. Quantitative Methods

The sets of knowledge and skill statements in this section relate to the discipline of epidemiology, to the subspecialty of statistics that deals with health statistics, and to the applicability of these fields to disease prevention and health promotion. Application may be in research, in clinical practice, in health services organization and delivery, or in community dimensions of practice. This statements below fall into groupings dealing with epidemiology, statistical applications, and general applications. The fundamentals include:

1. Basic concepts and tools of epidemiology, "the study of the distribution and determinants of health-related states and events in populations, and the applications of (this study) to the control of health problems,"<sup>8</sup> including:
  - concepts of populations-at-risk, relative risk, and attributable risk;
  - methods for defining and computing rates of disease prevalence and incidence;
  - methods of determining and describing disease causation, including multiple causation;
  - methods for surveillance of acute and chronic disease incidence, prevalence, and distribution (by age, sex, socioeconomic status) and trends over time;
  - techniques for identifying patients at excess risk of medical conditions of interest;
  - techniques such as modeling for demonstrating ways in which environmental factors may be associated with, or may cause, acute or chronic disease;
2. Basic concepts and tools of statistical application which derive from "the science of assembling, classifying, and tabulating numerical data,"<sup>9</sup> including:
  - concepts of discrete and continuous measures, distribution and range, central tendency, sampling, tests of statistical significance, type I and II errors, statistical power, and correlation;
  - methodologies for collection and use of vital statistics, health status data, and health services data to analyze population characteristics, health trends, and health needs.
3. General applications, based on knowledge of quantitative methodologies included above and requiring:
  - methods, utility, and limitations of such applications as random sampling, random and non-random assignment in clinical trials, statistical significance testing, and multivariate analysis;
  - appreciation of the crucial importance of epidemiological methods and statistical applications in design and conduct of research in laboratory, clinical, epidemiological or program evaluation studies;

- critical evaluation of medical and scientific reports in terms of appropriateness and correctness of study design, data collection, analysis, sources of bias and confounding, and interpretation;
  - ability to compute sensitivity, specificity and predictive value of testing methods and applications;
  - awareness of basic sources for assistance in applying quantitative methods to the practice setting.
4. Ability to identify existing national, regional, state and local sources of health data and to assess their utility and limitations.

### C. Health Services Organization and Delivery

In this section statements of knowledge and skills applicable to disease prevention and health promotion cover determinants of health care policy and planning, the structure of our overall health care system that brings physicians (and other health care professionals) together with people who need and seek their advice and care, basics of health care financing, and basic concepts applicable to evaluation of outcomes of disease prevention and health promotion interventions. The fundamentals include:

1. Determinants of health care policy and planning, including:
- rights of individuals to receive needed health and medical care, including disease prevention and health promotion;
  - the role of information and data in rational assessment of health care resources, availability, and needs;
  - concerns of special interest groups and health professional organizations ranging from the vested interests of specific proprietary groups to the major forces of purchasers (i.e. providers and payers) of medical care;
  - national, regional, state and local legislation and regulations;
  - functions of government that can not be delegated, i.e. assurance, assessment and policy development.<sup>5</sup>

In addition, skills should be developed in;

- keeping informed on current health care policy and planning issues;
  - gathering, validating, and applying information in the planning process;
  - interpreting legislation and regulations relating to health care.
2. General aspects of health care system structure as it affects physician-patient contacts and care provided, including at least:

- present and future sites and delivery methods of ambulatory health and medical care, e.g. HMO's and for-profit clinics as well as solo and partnership physician practices;
- location and activities of non-physician health professionals in the health care system;
- the nature and effect of ownership and operation of the full range of medical care facilities-- hospitals, nursing homes, free-standing clinics, HMO's, and others--that can influence the ways in which patients locate and receive care;
- trends in primary care and other health professional training and specialization, and in primary care, which influence the inclusion of disease prevention and health promotion interventions in clinical practice.

3. Basics of health care financing, including at least:

- basic facts about the magnitude and distribution of resources for health and medical care in the U.S.;
- basic information about trends in costs of health and medical care in the U.S. (and in comparison with other developed countries), including how these affect provision of disease prevention and health promotion services;
- basic facts about societal costs of avoidable illness and injuries and possibilities for affecting these costs by providing disease prevention and health promotion services.
- Basic approaches to evaluation of outcomes of disease prevention and health promotion interventions, including:
  - systematic evaluation of the effectiveness and costs of various ways of including disease prevention and health promotion in patient care;
  - consideration of quality of life as well as other factors in outcome evaluation;
  - the role and relationship of official health agencies in delivery of health services.

## D. Community Dimensions of Medical Practice

Statements of knowledge and skills relating to community dimensions of medical practice have been grouped to address general aspects of community organization, general public health/ primary care issues, environmental and occupational health aspects of community health, and international health. The fundamentals are:

1. General aspects of community organization, such as:

- types of existing public and private health and human service agencies, e.g. government-supported public health and welfare agencies at Federal, state and local levels, such as the U.S. Department of Health and Human Services, state departments of public health and welfare, and local health and welfare agencies;

- privately-operated health and human service agencies and facilities, such as hospitals, nursing homes, family service agencies, voluntary agencies concerned with specific diseases or types of services;
  - ways in which community agencies' resources and services can be utilized by physicians and other health care professionals to enhance and extend their scope of patient care, particularly its disease prevention and health promotion components;
  - opportunities for physicians to participate in and contribute to development of public policy and health care planning and programming, management of health care facilities and agencies, and provision of care in publicly supported programs and facilities--in all cases including disease prevention and health promotion;
  - methods of assessing perceived health needs in a community setting.
2. General public health/ primary care issues, including:
- extent of government responsibility for and involvement in developing and implementing public policy for disease prevention and health promotion, e.g. through development of the Year 2000 National Health Objectives<sup>10</sup> and implementation of the objectives with the assistance of Healthy Communities 2000.<sup>11</sup>
  - legislation and programming applicable to Federal agencies such as the Centers for Disease Control and Prevention and the Office of Disease Prevention and Health Promotion;
  - kinds and extent of responsibility for disease prevention and health promotion programming and service carried by public health agencies, e.g. community health education programs, nutrition programs, and maternal and child health programs such as those concerned with the need for prenatal care and childhood immunization;
  - the potential and limitations of community-oriented primary care as an approach to disease prevention and health promotion.
3. Environmental and occupational health aspects of community health, including:
- existing potential for adverse effects of toxic substances and other environmental hazards on populations and individuals, e.g. of air and water pollution and food and drug contamination;
  - the physician's responsibility for recognition of adverse effects of toxic exposure and other environmental hazards, for obtaining adequate occupational/ environmental exposure histories from patients, for relating findings to existing environmental hazards, and for initiating disease prevention and health promotion interventions to prevent or counteract patient exposures.
4. International health, including awareness of:

- realities and implications of global epidemiology, including risk of international spread of contagious disease and environmental hazards;
- realities and implications of maldistribution of health and medical services, between and among nations and within national boundaries;
- the mission and programs of the World Health Organization and other United Nations health-related organizations, as well as opportunities for medical student participation in efforts to improve the health status of underdeveloped countries' populations;
- the impact of different perceptions and values on effective health care delivery in various cultural settings;
- special health problems of refugee populations in the U.S.;
- the ever-present danger posed by nuclear weapons and the potential for global conflict.

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*Support for this project was provided through the Association of Teachers of Preventive Medicine/Centers for Disease Control and Prevention Cooperative Agreement #USO/CC300860.*