

# Glossary of Medical Education Terms

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# Part 1

## Editorial: Medical Education Terminology

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Many who participate in conferences on medical education quite often face difficulty in understanding new educational terms and concepts introduced by speakers. Looking for definitions or descriptions is often not an easy task. Furthermore, when searching various dictionaries and publications, one learns that the definitions of many terms, if they do in fact exist, are often equivocal or unrelated to medical education. There is universal agreement on the importance of common understanding of various terms and methods, especially in view of rapidly growing globalization of medical education and the use of different languages for communication. In addition, the concept of continuous medical education that links undergraduate with postgraduate and continuing education (CME) demands that the terms used in different stages and by different people have the same meaning for all partners in the educational process.

The Glossary was prepared with the intention of assisting in communication among medical educators. The developed formulations of educational definitions, terms and methods derive from different sources such as dictionaries, encyclopedias, glossaries, articles and the Internet. An attempt has been made to present as clearly as possible the most broadly accepted views. The greatest difficulty is that there are often quite significant differences in definitions of the same or similar concepts and terms. Unfortunately, this is often the case in multi-professional fields such as medical education.

Over the past few decades, many changes in medical education, in particular at the undergraduate level, were introduced. Increasingly innovative curricula, methods and educational tools were developed through the cooperation of medical professionals with pedagogues, sociologists, psychologists, information specialists and those in many other related professions. However, they have helped bring to medical education various concepts, definitions and vocabularies not known before to medical professionals. In many cases, this has quite unintentionally caused confusion, controversy and misunderstanding, as the vocabulary used by disciplines outside medicine often have different focus and meaning.

The dictionary format has been chosen for the Glossary in order to provide answers to specific questions, as well as short descriptions to give a wider understanding of each term or method. All of the terms discussed are presented in relation to their relevance for medical education. As population health and information management are becoming a more and more broadly integral part of undergraduate medical education, the Glossary includes also the most important terms from these areas as well as terms used in the administration and management of health systems. In addition, the Glossary includes short descriptions of some important associations and organizations involved in medical education.

In all branches of science and the arts, terms are often used with meanings specific to subject and context. As the number of new concepts is growing, the meaning of some definitions may therefore not be clear to all readers, especially if they are developed in different languages. Therefore it was not intended to provide absolute conclusive definitions in all cases. Some of the entries may prove to be controversial when read by medical educators from different professional backgrounds. The Glossary aims to stimulate discussion in a field that is full of debate and different ideas.

Finally, the author would like to encourage and welcome any criticism, corrections, additions and proposals for change in the formulation of different terms, to be considered for the next edition of the Glossary. It is hoped that this publication will enable better understanding and communication between educators. It is hoped, also, that this will help to put current discussions about medical education in context.

Andrzej Wojtczak

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# Part 2

## Glossary of Medical Education Terms

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### Accessibility

A measure of the ease with which a specific population can obtain appropriate health services and be served by facilities within the health care system. This concept is used to detect inequity in the availability of health services for different populations defined geographically, socially or in terms of their race, ethnicity, gender or clinical condition.

### Accreditation

A self-regulatory process by which governmental, non-governmental, voluntary associations or other statutory bodies grant formal recognition to educational programs or institutions that meet stated criteria of educational quality. Educational programs or institutions are measured against certain standards by a review of written information, self-studies, site visits to the educational program, and thoughtful consideration of the findings by a review committee. Whereas programs or institutions are accredited, individual physicians are licensed or certified.

### Administration

A system whereby public or private enterprises conduct their business. Administration is concerned with planning, programming and evaluation. Along with administration there must be consideration of management, which as a part of administration, is a rational technique enabling administrators to fully develop their human, technical and financial resources. The term “administration” is often used to denote broad policy, and the term “management” to denote the execution of such policy.

### American Medical Association (AMA)

According to its mission statement, this professional association represents the voice of the American medical profession and constitutes the partnership of physicians and their professional associations dedicated to promoting the art and science of medicine and the betterment of public health. The AMA serves physicians and their patients by establishing and promoting ethical, educational, and clinical standards for the medical profession and by advocating the highest principle of all: the integrity of the physician/patient relationship.

<http://www.ama-assn.org/>

### Assessment

A system of evaluation of professional accomplishments using defined criteria and usually including an attempt at measurement either by grading on a rough scale or by assigning numerical value. The purpose of assessment in an educational context is to make a judgment about the level of skills or knowledge, to measure improvement over time, to evaluate strengths and weaknesses, to rank students for selection or exclusion, or to motivate. Assessment should be as objective and reproducible as possible. A reliable test should produce the same or similar scores on two or more occasions or if given by two or more assessors. The validity of a test is determined by the extent to which it measures whatever it sets out to measure. One can distinguish three types of assessment:

- Formative assessment is testing that is part of the developmental or ongoing teaching/learning process. It should include delivery of feedback to the student.
- Summative assessment is testing which often occurs at the end of a term or course, used primarily to provide information about how much the student has learned and how well the course was taught.
- Criterion-referenced assessment refers to testing against an absolute standard such as an individual’s performance against a benchmark.

### Association for Medical Education in Europe (AMEE)

A worldwide association concerned with education in the medical and health care professions – teachers, curriculum developers, deans, administrators, researchers and students. AMEE works with the continuum of education and its quality, the facilitation of high quality research in medical education and serves as a source of advice on matters relating to medical education. AMEE assists with the development of skills required by medical teachers and facilitates the exchange of information on medical education. AMEE is concerned with the development of medical education to meet current and future needs, particularly in the European context. The AMEE Office is located at the Centre for Medical Education, University of Dundee, Scotland.

<http://www.amee.org/>

## **Association of American Medical Colleges (AAMC)**

A nonprofit association consisting of the 125 accredited United States medical schools, the 16 accredited Canadian medical schools, more than 400 major teaching hospitals and health systems, some 90 academic and professional societies representing 75,000 faculty members, and the nation's medical students and residents. The purpose of the AAMC is to improve health through the advancement of academic medicine, and in pursuing this purpose, the AAMC works "to strengthen the quality of medical education and training, to enhance the search for biomedical knowledge, to advance research in health services, and to integrate education into the provisions of effective health care". The AAMC is responsible for the Medical College Admission Test (MCAT) required of each applicant to medical school in the U.S. and Canada.

<http://www.aamc.org/>

## **Basic Science Years**

A term that usually refers to the initial two years of a medical school's program. However, in some schools, this may entail more or less than two years. With the introduction of new learning methodologies such as Problem-Based Learning (PBL) and early exposure to patients, basic science learning has become more integrated with clinical instruction and the division between basic science years and clinical years has eroded.

## **Bedside Teaching**

A part of clinical rounds where both student and instructor attend the patient's bedside to discuss the case and/or demonstrate a clinical procedure. This is the student's opportunity to see how the attending physician relates to the patient and to get hands-on instruction in interviewing a patient, physical examination, and counseling skills.

## **Best Evidence Medical Education (BEME)**

Methods and approaches used by teachers of medical education based on the best available evidence as opposed to opinion-based education. BEME should take into account these factors: how reliable the evidence is as well as its utility, extent, strength, validity and relevance. It calls for critical appraisal of available literature and existing databases and identifying any existing gaps.

<http://www.bemecollaboration.org/>

## **Case Management**

Coordination of services to help meet a patient's health care needs, especially when the patient requires multiple services from multiple providers.

This term is also used to refer to coordination of care during and after a hospital stay.

## **Certification**

The process by which governmental, non-governmental or professional organizations or other statutory bodies grant recognition to an individual who has met certain predetermined specified qualifications. In most cases, such recognition is on a voluntary basis.

## **Chart Stimulated Recall Oral Examination (CSR)**

A measurement tool for assessing clinical decision-making and the application of medical knowledge using actual patients and a standardized oral examination. A trained and experienced physician/examiner questions the examinee about the provided care, probing for the reasons behind the work-up diagnoses, interpretation of clinical findings and treatment plans. The examiners rate the examinee using an established protocol and scoring procedure. In an efficiently designed CSR, each patient case (test item) takes 5 to 10 minutes. A typical CSR exam involves one or two physicians as examiners per separate 30 to 60-minute sessions. The examinee's performance is measured by combining scores from all the cases tested for a pass/fail decision overall, or by scoring for each session. Exam score reliabilities have been reported between 0.65 and 0.88. In assessing recall ability or medical knowledge, multiple-choice questions (MCQ) are more effective than CSR exams.

## **Checklist Evaluation**

A method that is useful for assessing any competency or competency component that can be broken down into specific behaviors or actions. To obtain consistent scores and satisfactory reliability of observed performance using checklists, trained evaluators are required. To ensure the validity of content and scoring rules, checklist development requires consensus by several experts on the essential behaviors, actions and criteria for evaluating performance. The usefulness of checklists is well documented for evaluation of patient care skills (history and physical examination) and interpersonal and communication skills. Checklists have also been used for self-assessment of practice-based learning skills, and in addition are very useful in providing feedback on performance.

## **Clerkships**

A rotation around the clinical settings of the medical school. Some clerkships are obligatory (e.g., internal medicine, pediatrics, surgery), while others are elective or selective. In the United States, medical students do clerkships in their third and fourth year

while in Europe, this typically occurs in the fourth through sixth year of medical school.

### **Clinical Competence**

The mastery of relevant knowledge and the acquisition of a range of relevant skills at a satisfactory level including interpersonal, clinical and technical components at a certain point of education, i.e., at graduation. In the case of clinical training, which is primarily based on an apprenticeship model, teachers define what the student is expected to do and then test their ability to do it. However, in actuality, most clinical actions are concerned with problems for which there are no clear answers and no single solution. In such situations, an experienced doctor searches his or her mind and sifts through a wide range of options and in some cases the solution will be something he or she has never arrived at before. Therefore, competence itself is only of value as a prerequisite for performance in a real clinical setting and does not always correlate highly with performance in practice.

### **Clinical Oral Examination (COE)**

Unstructured clinical and oral examination which is the traditional form of clinical examination and continues to be popular in many parts of the world. With face-to-face contact, examiners explore both the breadth and depth of a student's understanding in real-life clinical situations. Aspects of competence which can be tested include the ability to respond to new information, a variety of interpersonal skills, and those aspects of competence that cannot be easily measured by more objective methods, such as an OSCE. Case variability can be reduced by recruiting a small group of patients with the same condition and similar symptoms or by the use of simulated patients. The use of videotapes of students undertaking a long-case examination with subsequent scoring of the performance by the examiner, who then discusses the results with the examinee, enhances the value of this form of examination. Proper briefing and training of examiners and a very structured approach to scoring contribute to the quality of this exam.

### **Communication**

The process by which information and feelings are shared by people through an exchange of verbal and non-verbal messages. In the context of medical education, its primary function is to establish understanding between patient and doctor. In an atmosphere of effective communication, patients improve faster, cope better with post-operative pain, require less psychotropic drugs, and experience numerous other health benefits.

### **Communication Skills**

The term denotes proficiency in the interchange of information. These are essential skills for clinical practitioners because of the large and varied number of people they must communicate with every day. The idea that doctors automatically learn communication through experience or that doctors are inherently either good or bad communicators is being largely abandoned. It is now widely believed that such skills can be taught to both students and doctors by a variety of professionals including doctors and specialists in communication skills as an important part of undergraduate as well as postgraduate and continuing medical education.

### **Community**

A group of individuals living together in some form of social organization with cohesion in planning and operation and/or manifesting some unifying trait or common interest. In health care organization, it refers to the most local level of the health system. The form of services provided to a locality will vary according to each country's political, economic, social, cultural and epidemiological patterns.

### **Community Diagnosis**

Appraisal of the health status of a community in general or limited to specific health conditions, determinants or subgroups.

### **Community Medicine**

Denote the specialty that deals with the health and disease of a population or of a specified community. The goal is to identify health problems and needs, to identify means by which these needs may be met, and to evaluate the extent to which health services do so. Community medicine is concerned with specified populations rather than individuals.

### **Community-Based Education (CBE), Community-Based Learning (CBL), or Community-Based Teaching (CBT)**

A form of instruction where trainees learn professional competencies in a community setting focusing on population groups and also individuals and their everyday problems. The amount of time students spend in the community and organizational settings may vary. Instruction may take place at a general practice, family planning clinic, community health center or a rural hospital. During their training in the community, students learn about social and economic aspects of illness, about health services in the community and methods of health promotion, about working in teams, and about frequency and types of problems encountered outside a hospital setting.

## **Competence**

Possession of a satisfactory level of relevant knowledge and acquisition of a range of relevant skills that include interpersonal and technical components at a certain point in the educational process. Such knowledge and skills are necessary to perform the tasks that reflect the scope of professional practices. Competence may differ from “performance”, which denotes actions taken in a real life situation. Competence is therefore not the same as “knowing”. On the contrary, it may well be about recognizing one’s own limits. The more experienced the professional being tested, the more difficult it is to create a tool to assess their actual understandings and the complex skills of the tasks they undertake. A holistic integration of understandings, abilities and professional judgments, i.e., a “generic” model, is one where competence is not necessarily directly observable, but rather can be inferred from performance.

## **Constructed Response Questions**

A method of written examination in which examinees are required to construct their responses as opposed to selecting them from a set of options.

## **Continuing Medical Education (CME)**

A continuous process of acquiring new knowledge and skills throughout one’s professional life. As undergraduate and postgraduate education is insufficient to ensure lifelong physicians’ competencies, it is essential to maintain the competencies of physicians, to remedy gaps in skills, and to enable professionals to respond to the challenges of rapidly growing knowledge and technologies, changing health needs and the social, political and economic factors of the practice of medicine. Continuing medical education depends highly upon learner motivation and self-directed learning skills.

## **Cost-Benefit Analysis**

A comparison of all the costs and benefits of a given activity or program expressed in monetary terms. It is used for the allocation of funds in health care services. This form of analysis permits one to measure the costs for reaching particular objectives. In the case of health programs, benefits are often difficult to express in monetary terms, and furthermore, benefits may extend beyond the achievement of the desired effect, which makes such evaluation difficult.

## **Cost-Containment**

Denote the measures taken to control or restrict medical care expenditures or to reduce the rate of their growth. This includes a broad range of cost control mechanisms e.g. limiting budgets, cost-

sharing, regulation of supply of services and staff, patients’ waiting lists, exclusion of certain people from entitlement to services, standard costing, privatization, and managed competition.

## **Cost-Effectiveness Analysis**

A method for evaluating the relationship between the cost and the effectiveness of an activity or to compare similar or alternative activities to determine the relative degree to which they will produce the desired objectives or outcomes. The degree of effectiveness is understood to be the extent to which a given activity or program contributes to attaining the objectives of reducing the dimension of a problem or improving an unsatisfactory situation. The preferred action is the one that requires the least cost to produce a given level of effectiveness. In the health care field, the cost is expressed in monetary terms but the consequences may be expressed in physical units such as healthy life-years gained, the number of cases of disease detected or the improvement in health status of a population.

## **Cost-Efficiency Analysis**

A method for evaluating program or activity efficiency such as the extent to which resources are being used as productively as possible. In health care, it measures medical services provided in relation to their cost. This enables comparison between different health care providers.

## **Curriculum**

An educational plan that spells out which goals and objectives should be achieved, which topics should be covered and which methods are to be used for learning, teaching and evaluation.

## **Demand**

A need or desire for a product or service. Price, availability and quality of the product all affect demand. Demand for health services is often difficult to assess and surveys of willingness to pay may be necessary to estimate its scope or extent.

## **Determinant**

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

## **Diagnosis**

The process of determining health status and the factors responsible for producing it; it may be applied to an individual, family, group or community. The diagnosis should take into account etiology, pathology, and severity of the clinical state.

### **Direct Observations or Performance Audits**

A traditional approach for giving a firsthand assessment of skills and performance with immediate feedback to the student. The student is observed performing a complete history and examination which provides the best possible opportunity for the observer to make multiple judgments over a period of time in a variety of clinical situations. Use of observation checklists, training the raters and agreed-upon standards increase reliability and validity of these methods over the use of global rating forms which require additional resources. This approach has an advantage over most new methods.

### **Discipline-Based Approach**

Teaching of the individual classical medical disciplines such as anatomy, biochemistry, pathology, surgery or community medicine as separate educational building blocks. It is expected that this approach lays the foundation for contact with patients which tends to occur later, after completion of the basic science course. In this approach, it is left to the student to put together the knowledge gained in each discipline to form an overall picture of medicine.

### **Disease**

A general term used to refer to any departure from health in which a patient suffers. It can be defined as disorder of bodily function or destructive processes in organs, organs' systems or in an organism with recognizable signs and symptoms, and in many cases a known cause. The words *disease*, *illness* and *sickness* are used often interchangeably but are not synonymous. Rather, whereas *disease* relates to a physiological or psychological dysfunction, an *illness* is the subjective state of a patient who feels unwell and *sickness* encompasses a state of social dysfunction, such as the role that the individual assumes when ill.

### **Doctor**

See Physician.

### **Domain**

Denote a scope of knowledge, skills, competencies and professional characteristics which can be combined into one cluster and should be learned during undergraduate medical studies.

### **E-Health**

A term that refers to all forms of electronic health services provided over the Internet. It includes all educational, information and commercial services and products offered by professionals, non-professionals, businesses and consumers. Based on the unique capabilities of Internet, E-Health is enabling the

delivery of clinical services that previously have been the domain of telemedicine and telehealth. E-health differs from telemedicine and telehealth in that it is not "professional-centric" and is motivated by the financial gain, whereas telemedicine and telehealth are not. As it is Internet-based, E-health is making the provision of health care more efficient.

### **Educational or Instructional Objectives**

Statements that describe what learners should be able to master. A major aim is the acquisition of facts, concepts and principles. Developing instructional objectives involves learning the fundamentals and vocabulary of each discipline and developing a logical progression of concepts in each discipline. Resources and materials are more effectively deployed when instructional objectives are explicit. It is important to assure that objectives are measurable and that they delineate a specific level of competence. One can and should distinguish between knowledge, skill and attitude objectives.

### **Effectiveness**

A measure of the extent to which a specific intervention, procedure, regimen, or service, when deployed in the field in routine circumstances, does what it is intended to do for a specified population. In the health field, it is a measure of output from those health services that contribute towards reducing the dimension of a problem or improving an unsatisfactory situation.

### **Efficacy**

The ability to produce the necessary or desired result.

### **Efficiency**

An ability to perform well or achieve a result without wasting energy, human resources, effort, time or money. Efficiency can be measured in physical terms (technical efficiency) or terms of cost (economic efficiency). Greater efficiency is achieved where the same amount and standard of services are produced for a lower cost, if a more useful activity is substituted for a less useful one at the same cost or if needless activities are eliminated.

### **Elective Program**

An educational program where students are given the opportunity to select subjects or projects of their own choice, not covered by obligatory medical courses. This enables students to pursue individual aspirations, provides students with increased responsibility to further their own learning, and facilitates career choice by providing an opportunity to explore various areas of interest.

## Equity

A state of being fair or equal; equity in health implies the ideal that everyone should have a fair opportunity to attain his or her full health potential. More pragmatically, it implies that no one should be disadvantaged by being prevented from achieving this potential. The term *inequity* refers to differences in health, which are not only unnecessary and avoidable but, in addition, are considered unfair and unjust.

## Essays or Open-Ended Questions

An assessment method, distinguished from short-answer questions by the scope, the length of required answers, and the relative lack of specific cues for recall. Essay questions typically deal with larger issues and are based on information that is spread out over a number of learning sources. Students' answers should reflect both how much is known about a topic and how well organized knowledge of the subject is. As essay questions and answers are comparatively complex, more abilities are displayed than with other question types. They may be used to assess knowledge of basic and clinical science and its application to clinical problems. They provide information about the respondent perceptions, reasoning abilities, attitudes, feelings, and experiences. Because such questions typically require extensive knowledge as well as analytical and writing skills, they perhaps are best suited for deciding who the top students in a course are. The essential weakness of essay questions is that they can be ambiguous, difficult to grade reliably and require scorers with relevant knowledge and training.

## Ethics

The branch of philosophy that deals with distinctions between right and wrong and with the moral consequences of human actions. Examples of ethical issues that arise in medical practice and research include informed consent, confidentiality, respect for human rights, and scientific integrity.

## Evaluation

A process that attempts to systematically and objectively determine the relevance, effectiveness, and impact of activities in light of their objectives. Evaluation can be related to structure, process, or outcome. One can distinguish these various types:

- *Formative individual evaluation* provides feedback to an individual (usually a learner) in order to improve that individual's performance. This type of evaluation identifies areas for improvement and provides specific suggestions for improvement serving as an educational tool.
- *Summative individual evaluation* measures whether specific objectives were accomplished by an individual in order to place a value on the

performance of that individual. It may certify competency or lack of competency in performance in a particular area.

- *Formative program evaluation* provides information in order to improve a program's performance. It usually takes the form of surveys of learners to obtain feedback about and suggestions for improving a curriculum. Quantitative information such as ratings of various aspects of the curriculum can help identify areas that need revision. Qualitative information, such as responses to open-ended questions about program strengths and weaknesses, as well as suggestions for change, provide feedback in areas that may not have been anticipated and provide ideas for improvement. Information can also be obtained from faculty or other observers, such as nurses and patients.
- *Summative program evaluation* measures the success of a curriculum in achieving learner objectives for all targeted learners, its success in achieving its process objectives, and/or its success in engaging, motivating, and pleasing its learners and faculty. In addition to quantitative data, summative program evaluation may include qualitative information about unintended barriers or unanticipated effects encountered in program implementation.

Formative evaluations generally require the least amount of rigor, whereas summative individual and summative program evaluation for external use (e.g., certification of competence) requires the greatest amount of rigor. When a high degree of methodological rigor is required, the measurement instrument must be appropriate in terms of content, reliability, validity, and practicality.

## Evaluation, 360-Degree

A method used to assess interpersonal and communication skills, professional behaviors, and some aspects of patient care and systems-based practice. Usually, evaluators completing rating forms in a 360-degree evaluation are superiors, peers, subordinates, and patients and their families. Most 360-degree evaluation processes use a surveyor questionnaire to gather information about an individual's performance on several topics, such as teamwork, communication, management skills, and decision-making. Most 360-degree evaluations use rating scales to assess how frequently a behavior is performed. The ratings are summarized for all evaluators by topic and also overall to provide feedback. Such feedback is more accurate when the evaluation is intended to give formative feedback rather than summative. Reproducible results are easily obtained when several evaluators rate examinees; a greater number of faculty and patients are needed for a greater degree of reliability.

## **Faculty Development**

Because faculty members may be experts in their subject but may not have received special training in educating others, faculty development programs exist to enable these teachers to acquire the necessary professional knowledge, skills, attitudes and tools. It is an essential component for obtaining high reliability and validity of applied assessment on a day-to-day basis. It also enhances ongoing formative evaluation so that students are given feedback to help them improve continuously. Faculty development activities can be organized as series of special workshops, readings, or individualized feedback sessions. Since teaching is considered a very important aspect of a physician's work, such educational programs are often viewed as a form of Continuing Medical Education.

## **Faculty-Ratings Questionnaires**

Questionnaires completed by faculty members that are used in the assessment of student deficiencies and achievements as well as professional behavior and competence. They provide indirect, inexpensive measures of clinical skills attainment and real-life students' performance. However, Faculty-Ratings Questionnaires are subject to rating biases.

## **Flexner Report**

The report researched, written and published by Abraham Flexner (1866-1959) in 1910 for the Carnegie Foundation and entitled "Medical Education in the United States and Canada" is known today as the Flexner Report. It triggered much-needed reforms in the standards, organization, and curriculum of North American medical schools. At the time of the Flexner Report, many medical schools were proprietary schools operated more for profit than for education. Flexner proposed that medical schools operate instead in the German tradition of combining strong biomedical sciences with hands-on clinical training. The report caused many medical schools to close down. It remains one of the most important publications on medical education in the 20th century.

Abraham Flexner was not a doctor, but a secondary school teacher and principal for 19 years in Louisville, Kentucky. He did graduate work at Harvard University and the University of Berlin and joined the research staff of the Carnegie Foundation for the Advancement of Teaching. In 1930, Flexner founded the Institute for Advanced Study at Princeton University and served as its first director. Albert Einstein joined the Institute in 1933. Flexner was one of the great educators of the 20th century. Modern medical education and medicine in North America owes a large debt to him.

## **Global Minimum Essential (Core) Requirements**

Specification of the competencies related to knowledge, skills, professional attitudes and ethical

values which students should possess at graduation, regardless of where they are trained. In medical education, this is represented as a three-tiered structure with international, national, and local layers, which reflects the competencies specific to given settings and cultures where the physician will practice in addition to universal competencies required by physicians throughout the world.

## **Global-Rating of Live or Recorded Performance Forms**

Ratings by faculty supervisors to assess trainees' medical knowledge, interpersonal and communication skills and patient care clinical skills which are completed retrospectively and are based on general impressions collected over a period of time. They are derived from multiple sources of information such as direct observations or interactions, input from other faculty, residents or patients; review of work products or written materials. They differ from other rating forms in that a rater judges general categories of ability and skills rather than specific skills, tasks or behaviors. The rating forms contain scales used by the evaluator to judge knowledge, skills, and behaviors listed on the form. Scoring these forms entails combining numeric ratings with comments to obtain a useful judgment about performance based upon more than one rater. Reproducibility appears easier to achieve for ratings of knowledge and more difficult to achieve for patient care and interpersonal and communication skills. To improve reproducibility, the rater should be well trained; otherwise the scores can be highly subjective and competencies may be rated similarly regardless of performance.

## **Goal**

A general aim, object or end-effect which one strives to achieve.

## **Graduate Medical Education (GME)**

In the United States, this term typically refers to residency training and fellowships; the education physicians receive after finishing medical school. In many other countries it is called specialty training or postgraduate education.

## **Graduate Training or Internship**

The phase of acquiring widening clinical experience through the practice of basic clinical skills and judgment. This is normally used to designate the period of hospital clerkship. The periods of undergraduate education and graduate training together comprise the doctor's basic medical education.

## **Guidelines**

A set of steps to be taken in performing a task or implementing a policy, program or activities and the manner of doing so. Guidelines are more specific and more detailed than guiding principles, on which they are based.

## **Health**

In accordance with the Constitution of the World Health Organization (1948), health is “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. Health is defined here as a positive concept, emphasizing social and personal resources as well as physical capabilities.

## **Health Care**

Services provided to individuals or communities by a health care system or by professionals to promote, maintain, monitor, or restore health. Health care contains a broad spectrum of services and activities delivered by a team of health personnel. This contrasts with medical care, which concentrates on diagnostic and therapeutic actions performed by or under the supervision of an individual physician.

## **Health Economics**

A discipline which concentrates on the application of the principles and rules of economics in the sphere of health. In broad terms, it includes analysis and evaluation of health policy and the health system from an economic perspective. In particular, it includes health system planning, market mechanisms, demand for and supply of health care, micro-economic evaluation of individual diagnostic and therapeutic procedures, determinants of health and its valuation, and evaluation of the performance of health care systems in terms of equity and allocative efficiency.

## **Health Maintenance Organization (HMO)**

An organization that arranges a wide spectrum of health care services which commonly include hospital care, physicians' services and many other kinds of health care services with an emphasis on preventive care.

## **Health Maintenance Services**

Any health care service or program that helps maintain an individual's good health. This includes all preventive medical practices such as immunizations and periodic examinations, as well as health education and special self-help programs.

## **Health Management**

Systematic use of the full range of human, technical and financial resources of the health system through planning, organizing, leading and controlling the effort of members to achieve stated goals and to render optimum services at minimum cost. Health managers achieve desired goals by directing and influencing subordinates, and organizing others to perform essential tasks to ensure that the organization is moving towards its goal of improving health.

## **Health Plan**

A term that has different meanings depending upon the context. “Health plan” can be used to mean an HMO; a “health benefits plan” is provided by an employer to its employees, or services offered by an insurer or third party administrator to employers and/or employees.

## **Health Policy**

A set of decisions or commitments to pursue courses of action aimed at achieving defined goals of improving health. Policies usually state or imply the values that underpin the policy position. They may also specify the source of funding that can be applied to planning and implementation of policy and to relevant institutions to be involved in this process.

## **Health Promotion**

The process of enabling individuals to increase control over and improve their health. It involves the population as a whole in the context of their everyday lives, rather than focusing on people at risk for specific diseases, and is directed toward action on the determinants or causes of health.

## **Health Risks Appraisal**

A method of describing an individual's probability of becoming ill or dying from selected causes. Starting from the average risk of death for that individual's age and sex, various lifestyle and physical factors are considered and it is determined whether the individual is at greater or lesser than average risk from the commonest causes of death for their age and sex. Health risk appraisal also indicates the reduction in risk which could be achieved by the individual's altering any of the causal factors (such as cessation of cigarette smoking).

## **Health Services**

Services performed by health care professionals or by others under their direction for the purpose of promoting, maintaining, or restoring health. In addition to personal health care, health services include health protection, health promotion, and disease prevention.

## Health Status

A general term for the state of health of an individual, group or population that reflects the degree to which a person is able to function physically, emotionally, and socially, with or without aid from the health care system.

## Health System

A complex of interrelated elements that contribute to health in homes, educational institutions, workplaces, public places, and communities. A health system is usually organized at multiple levels, starting at the most local level, also known as community or primary health care level, and proceeding through the intermediate (district, regional or provincial) to the central level, providing progressively more complex and more specialized care and support.

## Healthy Behavior

The combination of knowledge, practices and attitudes that together contribute to motivate actions we take regarding our own health. Healthy behavior may promote and preserve good health. On the other hand, behaviors harmful to health such as tobacco smoking, alcohol drinking, drug abuse and lack of physical exercise may be determinants of disease.

## Hippocratic Oath

An affirmation usually taken by physicians about to enter the practice of medicine. It is attributed to Greek physician, Hippocrates of Cos, who is called the "Father of Medicine" (circa 460-377 B.C). Its content reflects the ethical code of the physicians' attitudes and behavior and obligations towards patients, colleagues and society. The complete text can be found here.

## Indicator

A variable that helps to measure changes directly or indirectly and permits one to assess the extent to which objectives and targets of a program are being attained. In medicine, indicators help to measure changes in the health situation of a population.

## Information Management

A method used to organize information to avoid information overload and to keep information in a format that is efficient to retrieve whenever needed. Filing systems, cognitive maps, manuals, and electronic databases are examples of devices that can prove useful in information management. A network of consultants is an additional way to ensure that necessary information will be readily available.

## Institute for International Medical Education (IIME)

A non-profit medical Institute established in 1999 by a grant from the China Medical Board of New York, which began its own operations in 1914 as a division of The Rockefeller Foundation. The IIME has been entrusted with the development of 'Global Minimum Essential (Core) Requirements' which include knowledge, clinical skills, professional ethical values and fundamental competencies to the practice of health care worldwide. These essential requirements represent only a portion of the educational experience, since each country and even each medical school has unique needs that the educational curriculum should address. Three committees composed of medical experts from around the globe supervise the work of IIME: the Core Committee, the Steering Committee and the Advisory Committee. The Institute is located just outside of New York City in suburban White Plains, New York.

<http://www.iime.org/>

## Integrated Teaching

A method of teaching that interrelates or unifies subjects frequently taught in separate academic courses or departments. In integrated teaching, subjects are presented together as a meaningful whole. Integration may be vertical or horizontal.

- *Horizontal integration* functions between parallel disciplines such as anatomy, histology, biochemistry or medicine, surgery and pharmacology.
- *Vertical integration* functions between disciplines traditionally taught in different phases of curriculum; it can occur throughout the curriculum with medical and basic sciences beginning together in the early years.

## Internship

A first postgraduate training year in which graduates practice medicine under supervision. In some countries, this is a requirement for licensure. In many countries and for many specialties such as internal medicine, pediatrics and surgery, this is the first year of residency. However, as there are some specialties that are too narrow to provide a broad medical practice experience, those residents may have to attend a transitional year in one of the above specialties or a rotating internship.

## Knowledge

The acquisition or awareness of facts, data, information, ideas or principles to which one has access through formal or individual study, research, observation, experience or intuition.

## Learner-Centered Education

A method of teaching in which the students' needs have priority. Learners are responsible for identifying knowledge gaps, actively participating in filling them, and keeping track of their learning gains. Teachers are expected to facilitate this process instead of supplying "spoon-fed" information. This approach increases the students' motivation to learn and prepares them for self-learning and continuous education. Learner-centered education is the opposite of teacher-centered education.

## Lecture

An instruction or verbal discourse by a speaker before a large group of students. This teaching method has historically been quite prominent in education because it is an economic way to communicate information to large groups. However, increasing knowledge about the group's difficulties in maintaining concentration and absorbing extensive information while in a passive listening mode has brought the value of lectures under criticism. Audiovisual presentations, demonstration of patients and intermittent discussions can help activate learners.

## Liaison Committee on Medical Education – LCME

A group organized under the sponsorship of the American Medical Association (AMA) and Association of American Medical Colleges (AAMC) to accredit educational programs leading to the M.D. degree in the US and Canada.

<http://www.lcme.org/>

## Licensure

The process by which different governmental or non-governmental agencies, such as specialty boards or other bodies, grant permission to practice a profession to persons meeting predetermined qualifications to engage in a given occupation or use a particular title. In the case of physicians, licensure ensures that they have appropriate education and training and that they abide by recognized standards of professional conduct while serving their patients. This is typically done at a national or local level. In the United States, licensure is a process by which physicians receive permission to practice medicine. Candidates for licensure must first complete the rigorous United States Medical Licensing Examination (USMLE), designed to assess a physician's ability to apply knowledge, concepts, and principles that are important in health and disease and that constitute the basis of safe and effective patient care. All applicants must submit proof of medical education and training and provide details about their work history. Results of the USMLE are reported to state medical boards for use in granting the initial license to practice medicine. Each medical licensing authority

requires, as part of its licensing processes, successful completion of an examination or other certification demonstrating qualification for licensure.

## Life-Long Learning

Continuous training over the course of a professional career. Because medical science changes so rapidly, it is vital that its practitioners are committed to and engage in life-long learning.

## Lifestyle

A general manner of living based on the interplay between living conditions in the broad sense and individual patterns of behavior as determined by socio-cultural factors and personal characteristics. The range of behavior patterns open to individuals may be limited or extended by social environmental factors. For this reason, lifestyles are usually considered in the context of both collective and individual experiences and general conditions of life. A change of lifestyle may include such activities as stopping cigarette smoking, changing the pattern of nutrition or engaging in regular physical exercise.

## Managed Competition

Health care market regulations which use competition as the means to promote efficiency of the health care system. Within the framework of government intervention, managed competition helps to achieve policy objectives including price control, cost containment, quality control, control of pattern of service provision, greater accountability of local managers, closure of surplus facilities, control of powerful professional groups and greater equity in service access.

## Medical Education

The process of teaching, learning and training of students with an ongoing integration of knowledge, experience, skills, qualities, responsibility and values which qualify an individual to practice medicine. It is divided into undergraduate, postgraduate and continuing medical education, but increasingly there is a focus on the "lifelong" nature of medical education.

- *Undergraduate education or basic medical education* refers to the period beginning when a student enters medical school and ends with the final examination for basic medical qualification. This period of education comprises a pre-clinical and a clinical period. It can result in granting a license to practice, which may be provisional and subject to conditions as to supervision; or permitting the start of postgraduate education. *In the United States*, however, undergraduate education refers to pre-medical college education, which results in a Bachelor's degree and is the

training most students receive before entering medical school.

- *Postgraduate education, graduate medical education or specialty training* is used to designate the more or less continuous period of post-basic training which, when it occurs, normally directly follows undergraduate training and is designed to lead to competence in a chosen branch of medical practice.

### **Medical Educator**

A professional who focuses on the educational process necessary to transform students into physicians. Some medical educators are physicians, but an increasing number have backgrounds in education, behavioral or other health sciences.

### **Medical Informatics**

Medical informatics is a scientific field that deals with the storage, retrieval and optimal use of information and data. Rapid development is due to advances in computing, communication technology and an increasing awareness that the knowledge base of medicine is essentially unmanageable by traditional paper-based methods.

### **Medical School**

A higher education or university level institution offering a prescribed course of medicine. The following are examples of the names that such institutions may bear and which vary from one country to another or even within countries: Medical College; College of Surgeons; Medical Institute; Institute of Medicine and Pharmacy; Institute of Medicine and Surgery; Faculty of Medicine; Faculty of Medical Sciences; Faculty of Medicine and Surgery; Academy of Medicine or Medical Academy; University Center for Health Sciences; Medical University; Faculty of Medicine and Pharmacy.

### **Minimum Essential Requirements**

This specifies the knowledge, skills and attitudes related to the sciences basic to medicine, clinical practice, professional behavior and ethical values. The graduate of undergraduate medical education should possess these to ensure that he or she is prepared to begin further graduate medical education (specialty training) or to start practicing medicine under supervision.

### **Modified Essay Question (MEQ)**

A measurement instrument which allows for assessment of clinical reasoning skills, understanding and knowledge of clinical and basic science and application of basic science to clinical problems. MEQs constitute a series of questions which must

be answered in the sequence asked, with no review and no possibility of correcting previous answers. Questions must be answered within the allocated time which may vary from 40 to 90 minutes. In general, a brief patient clinical scenario (presentation) is followed by a few questions exploring diagnostic hypotheses and mechanisms underlying the clinical presentation. Subsequent questions may focus on applied basic science, interpretation of diagnostic information, management issues, disease complications, ethical issues or prognosis, for example. The initial scenario is either repeated or reformulated as the reporting process progresses, and as further information is provided, the assessed area narrows. Thus, the medical problem is progressively defined with questions being directed to increasingly specific areas. A well-written MEQ assesses the approach of students to a problem, their reasoning skills and understanding of concepts, rather than recall of factual knowledge.

### **Multiple Choice Questions (MCQ)**

An assessment tool that requires examinees to identify the one correct answer to a question. It consists of a stem that directly or indirectly poses a question and a set of distracters from which the answer is selected. In its simplest form, it comprises a stem statement followed by related statements which an examinee marks as either true or false. Another type asks examinees to select a correct or best answer from a number of options. In the '*extended matching*' type test, a short vignette about a patient is presented and the examinee is asked to select the best response from approximately 15-20 choices. Such extended matching questions, a relatively new form of MCQ, reduce the potential for guessing to marginal terms. The test reliability is achieved by formulating a large number of well-constructed questions; this requires considerable skill. The great strength of the multiple-choice format is its ease and reliability of scoring. Checking answers is mechanical and requires neither interpretation nor special knowledge. Most commonly administered multiple-choice exams are scored by machine and provide statistical information about the exam, such as item difficulty and item-test correlations. For these reasons, multiple-choice questions are popular among instructors offering the advantage of allowing different kinds of questions, at various levels of difficulty. The *computerized version of MCQ* can cover a large area of knowledge in a short space of time. And poor questions which fail to discriminate between candidates of different ability can be easily identified. Using a greater number of questions is beneficial, as a larger set of questions provides better coverage of course material, and students' test scores are more reliable. The correct answers are pre-specified and hence marking in some respects is objective. A large number of examinees can be tested with relatively

few resources. The major disadvantage to multiple-choice questions is that they are time-consuming to construct. However, once constructed, multiple-choice questions can be used again, in either original or modified form. Since these tests primarily measure knowledge only, they are now often being replaced with more performance-based assessment methods.

## Objective

In medical education, it is what the learner will be able to know or do after taking part in educational activities. Objectives should result from assessment of the needs of the patient or population.

## Objective Structured Clinical Examination (OSCE)

A method introduced in 1972 as a more standardized way of assessing clinical competencies. It provides a standardized means to assess physical examination and history-taking skills, communication skills with patients and family members, breadth and depth of knowledge, ability to summarize and document findings, and ability to make a differential diagnosis or plan treatment. The examiners carefully plan the tested areas and objectives of the test are identified and recorded. The clinical competency to be tested is broken down into its various components such as taking a history, auscultation of the heart, interpretation of an ECG, or making a conclusion on a basis of findings. Candidates rotate through a series of "stations", usually 12-20, and in a specified time perform a standardized task.

The format of individual OSCE varies significantly. Clinical models and standardized patients or simulated patients can be used to allow large numbers of students to be tested on the same clinical problem without causing fatigue or stress to real patients. Direct or indirect observations as well as checklists and rating scales measure the performance against predetermined standards resulting in a more objective examination than with traditional methods. This provides a more valid and more reliable examination permitting the move away from testing factual knowledge to testing a wide range of skills. The variables of the examiner and the patient are, to a large extent, removed. OSCE is particularly suited to situations where a pass/fail decision has to be taken and where a decision has to be made as to whether a student has reached a prescribed standard. It is cost-effective when many candidates are examined at once, as it is difficult to create and administer and requires resources and expertise. With succeeding examinations, less time is required and both time and effort can be reduced if a bank of objective test items and checklists is maintained.

Use of OSCE for formative assessment has great potential and value as the learners can gain insights into the elements making up clinical competencies as well as feedback on personal strengths and weaknesses. However, in the OSCE, the student's knowledge and skills are tested in compartmentalized fashion and he/she is not tested on the ability to look at a patient as a whole being. Still, OSCE may be combined with other forms of assessment, such as the clerking of cases in the wards. The previously used term for this assessment method was Multiple Station Exercises/Exam (MSE).

## Organ-Based Teaching

In this approach, medical competence is gained by focusing on one organ system at a time. It is an approach that integrates different disciplines (subjects) such as biochemistry, physiology and anatomy, and has ultimately led to the more common problem-based approach, which is currently more commonly used.

## Outcome

All possible demonstrable results that stem from casual factors or activities. In medical education, outcome refers to a new skill, knowledge or stimulus to improve the quality of patient care. Setting outcomes can be very useful for developing a framework of various results expected from various educational activities. Outcomes may be related to the educational process (process outcomes), to the product of undergraduate medical education (learning outcomes), or to the professional role of the physician (performance outcomes).

## Outcome-Based Education

This approach emphasizes educational outcomes rather than the educational process and focuses on the product of medical education such as what kind of doctors will be produced, and with what professional knowledge, skills, abilities, values and attitudes. Educational outcomes must be clearly specified as they determine the curriculum content, the teaching methods, the courses offered, the assessment process and the educational environment. The scope and definition of competence and the levels of its attainment is defined in terms of student development within the natural progression in medical school. Consequently, the assessment system will ensure that the expected variation of levels of attainment is defined and assessed. An example of such a framework is the 12-outcomes paradigm of Dundee - a model presented in the form of three-circles which describes the following:

- *What the doctor is able to do:* clinical skills; practical procedures; patient investigations; patient management; health promotion; disease prevention and communication.

- *How the doctor approaches his practice:* appropriate understanding of basic, social and clinical sciences and underlying principles; with appropriate attitudes and ethical understanding and legal responsibilities and with the appropriate decision-making skills and clinical reasoning and judgment.
- *The doctor as a professional:* understanding of the doctor's role within the health system and the understanding of personal development.

In addition, some medical schools have already incorporated advanced levels of progression in the early phases of their curriculum such as problem-based learning programs, early clinical exposure, and self-directed learning programs.

### Output

In the health field, this indicates the immediate result of professional or institutional health care activities, usually expressed as units of service such as patient hospital days, outpatient visits or laboratory tests performed.

### Pan-American Federation of Associations of Medical Schools – (PAFAMS)

A non-governmental, academic and educational organization that gathers information on medical schools in the Western Hemisphere from Canada to Argentina. Founded in 1962 in Chile, PAFAMS is striving through collaboration toward the improvement and development of innovative medical education. The constituency is integrated by 12 national Associations of Medical Schools, and comprises over 354 Medical schools. The mission is: "The promotion and advancement of medical education and the biomedical sciences in the Americas and the Caribbean".

<http://www.fepafem.org.ve/>

### Patient Management Problem (PMP)

A written method that attempts to assess clinical problem-solving abilities. To improve its validity, recent improvements include an attempt to focus testing on the key features within a clinical case, which represents the diagnostic or problem-solving challenge. The main advantage of this innovation is that many more 'clinical cases' can be administered to candidates in a given period of time than with conventional PMP.

- *Computer-Based Patient Management Problem (e-PMP)* is a related method that has been used for some years, which more recently has been enriched with the ability to link computers to various audiovisual inputs such as videodiscs and optical holograms produced by lasers extending realism of the simulations and conceivably providing

enhanced educational opportunities. The cost of developing, establishing and maintaining the required facility may constitute a significant constraining factor for broader use.

### Patient Surveys

Questionnaire used to assess patient satisfaction with different aspects of their health care. The questions address general aspects of the physician's care such as the amount of time spent with the patient, overall quality of care, physician competency (skills and knowledge), courtesy, and interest or empathy. Specific patient care competencies can be assessed including interpersonal and communication skills, professional behavior, listening skills, provision of information about examination findings, etc. Each rating may generate a single score overall or separate scores for different clinical care activities or settings. Most patient satisfaction surveys are completed at the time of service and require less than 10 minutes. Improvements to this tool may include utilizing more effective survey design and using computers to collect and summarize survey data.

### Peer Review or Peer Evaluation

Method for evaluating professional attitudes and behavior, used by trainees to assess each other and also used by supervisors, nurses and patients to assess trainees. Typical measurement tools for this form of testing are checklists and questionnaires.

### Performance

Denotes what an individual actually does in a real life situation. In medicine, it denotes what a student or doctor actually does in an encounter with a patient when applying learned knowledge and skills, mediated by clinical judgment and the use of interpersonal communication skills. From this standpoint, competence implies professional maturity and ease in making difficult decisions. And, although these elements are inherent in good practice, it is not easy to demonstrate them. Assessment of clinical performance is of the greatest importance but is often difficult to measure.

### Performance-Based Assessment

An evaluation that demands trainees be engaged in specified clinical activities. This permits evaluation of an ability to perform clinical tasks and not merely the recitation of medical knowledge. Typical measurement tools for this form of testing are checklists, observation logs, and anecdotal reports.

### Personal Development Plan (PDP)

A list of educational needs, development goals and actions and processes, compiled by learners and

used in systematic management and periodic reviews of learning. It is an integral part of reflective practice and self-directed learning for professionals. It can be equally valuable in teacher-directed medical training for maintaining learner-centered approaches and shared objectives. PDP can be used to manage learning needs systematically, to set development and performance improvement goals, organize learning activities and review outcomes. Some educational organizations accept completed plans for accredited professional development and health managers link them with appraisals.

## Physician

A professional, qualified by education and authorized by law to practice medicine. The essence of being a professional is an ability to find solutions to difficult problems for which there are no easily discovered answers and to effectively handle medical situations where no two patients are identical even if they have the same condition. This differentiates the *professional*, who must deal with complex problems that tend not to have unambiguous, clear-cut solutions, from the *technician*.

## Population Health

Organized efforts focused on the health of defined populations in order to promote and maintain or restore health, to reduce the amount of disease, premature death and disease-produced discomfort and disability. Programs, services and institutions here emphasize the prevention of disease and the health needs of the population as a whole. Among a broad scope of disciplines, various knowledge and skills are utilized such as biostatistics, epidemiology, planning, organization, management, financing and evaluation of health programs, environmental health, application of social and behavioral factors in health and disease, health promotion, health education and nutrition.

## Portfolio-Based Learning or Portfolios

A collection of evidence that learning has taken place, usually set within agreed objectives or a negotiated set of learning activities. Some portfolios are developed in order to demonstrate the progression of learning, while others are assessed against specific targets of achievement. In essence, portfolios contain material collected by the learner over a period of time. They are the learner's practical and intellectual property and the learner takes responsibility for the portfolio's creation and maintenance. Because the portfolio is based upon the real experience of the learner, it helps to demonstrate the connection between theory and practice, accommodating evidence of learning from different sources, and enabling assessment within a framework of clear criteria and learning objectives. The use of portfolios

encourages autonomous and reflective learning which is an integral part of professional education and development. Candidates are expected to produce evidence and process such evidence with relation to a pre-determined standard. Since the portfolio approach includes both content and a reflective component, one must first determine which components are to be assessed. Portfolios provide a process for both formative and summative assessment, based on either personally derived or externally set learning objectives or a model for lifelong learning and continuing professional development.

## Practicability of Assessment Procedures

As there are always restrictions on the resources available to conduct assessments, expertise and creativity are required to develop the best compromise between ideal and practical procedures and tools for assessment. Time and resources are required to develop a proper examination possessing minimally acceptable standards of validity and reliability. This applies particularly to the assessment of clinical skills where much longer or more frequent observations of student performance are required than are usually undertaken. The planning of exams should take into account the number of students to be assessed. An assessment procedure appropriate for 20 students may not be practical where 100-200 have to be evaluated. Important factors are the number of staff available, their status and specialties, number of available patients, available space or accommodation and the end-use of the assessment; for instance, if results are used to determine "pass or fail" status or to probe for areas of competence in which students are deficient.

## Prevention

The goals of medicine are to promote health, to preserve health, to restore health when it is impaired, and to minimize suffering and distress. These goals are embodied in the word prevention, which is easiest to define in the context of levels, customarily called primary, secondary and tertiary prevention:

- *Primary prevention* refers to the protection of health by personal and community wide effects, such as preserving good nutritional status, physical fitness, and emotional well-being, immunizing against infectious diseases, and making the environment safe.
- *Secondary prevention* can be defined as the measures available to individuals and populations for the early detection and prompt and effective intervention to correct departures from good health.
- *Tertiary prevention* consists of the measures available to reduce or eliminate long-term

impairments and disabilities, minimize suffering caused by existing departures from good health, and to promote the patient's adjustment to irremediable conditions. This extends the concept of prevention into the field of rehabilitation. There are no precise boundaries between these levels.

### **Preventive Medicine**

A specialized field of medical practice composed of distinct disciplines that focus on the health of defined populations in order to promote and maintain health and well-being and prevent disease, disability and premature death. It aims at the application of preventive measures within all areas of clinical medicine. In addition to the knowledge of basic and clinical sciences and the skills common to all physicians, practitioners of preventive medicine possess knowledge of and competence in other disciplines. Among a broad scope of such disciplines are: bio-statistics, epidemiology, planning, organization, management, financing, and evaluation of health programs, environmental health, application of social and behavioral factors in health and disease, health promotion, health education and nutrition.

### **Primary Health Care**

The World Health Organization defines primary health care as the principal vehicle for the delivery of health care at the most local level of a country's health system. It is essential health care made accessible at a cost the country and community can afford with methods that are practical, scientifically sound and socially acceptable. Everyone in the community should have access to it, and everyone should be involved in it. Beside an appropriate treatment of common diseases and injuries, provision of essential drugs, maternal and child health, and prevention and control locally endemic diseases and immunization, it should also include at least education of the community on prevalent health problems and methods of preventing them, promotion of proper nutrition, safe water and sanitation.

### **Primary Medical Care**

Primary medical care begins when a patient with a new health problem encounters the first-level provider of care. The provider initiates care, may screen for referral to a specialist, and secures overall responsibility for continuity of care provided by all medical personnel in both outpatient and in-patient settings.

### **Problem-Based Learning (PBL)**

In this approach, students learn in small groups supported by a tutor. They initially explore a predetermined problem. The problem contains triggers designed to evoke objectives or concepts

which are used to set the agenda for individual or group investigation and learning after the initial session. Subsequent group meetings permit students to monitor their achievements and to set further learning goals as required. The tutor's role is to offer support for learning and to help reach the expected outcomes. PBL enables students to develop the ability to translate knowledge into practice at an early stage, encourages individual participation in learning and also allows the development of teamwork skills. Students in PBL courses have been found to place more emphasis on "meaning" (understanding) than "reproduction" (memorization). Students must engage in a significant amount of self-directed learning; lectures are kept to a minimum. PBL originated at McMaster University in Canada, and then at Maastricht University, and is now widely adopted in medical schools in many countries. Each school makes its own adjustments to the basic model. It does require a heavy investment in resources (library books, IT, tutorial rooms) as well as requiring education and training for tutors.

### **Professionalism**

Adherence to a set of values comprising both a formally agreed-upon code of conduct and the informal expectations of colleagues, clients and society. The key values include acting in a patient's interest, responsiveness to the health needs of society, maintaining the highest standards of excellence in the practice of medicine and in the generation and dissemination of knowledge. In addition to medical knowledge and skills, medical professionals should present psychosocial and humanistic qualities such as caring, empathy, humility and compassion, as well as social responsibility and sensitivity to people's culture and beliefs. All these qualities are expected of members of highly trained professions.

The American Board of Internal Medicine's Project Professionalism indicates the most important elements of professionalism to be: altruism, accountability, duty, excellence, honor and integrity, and respect for others.

- *Professional Altruism*: constitutes the essence of professionalism and is based on the rule that the best interest of patients and not self-interest is the professional obligation.
- *Professional Accountability* is an important element of professionalism which is required of physicians at several levels: to their patients for fulfilling the implied contract governing the patient/physician relationship, to society for addressing the health needs of the public, and to their profession for adhering to medicine's time-honored ethical precepts.

- *Professional Duty* can be expressed by the free acceptance of a commitment to service, availability and responsiveness when “on call,” accepting inconvenience to meet the needs of ones patients, enduring unavoidable risks to oneself when a patient’s welfare is at stake, and advocating the best possible care regardless of the patient’s ability to pay. It is willingness to seek an active role in professional organizations and volunteering ones skills and expertise for the welfare of the community.
- *Professional Excellence* entails a conscientious effort to exceed ordinary expectations. Commitment to excellence is an acknowledged goal for all physicians and includes a commitment to life-long learning.
- *Professional Honor and Integrity* implies being fair, being truthful, keeping one’s word, meeting commitments, and being straightforward. It also requires recognition of the possibility of conflict of interest and avoiding any situation in which the interest of the physician is placed above that of the patient or allowing personal gain to supersede the best interest of the patient. It constitutes an integral part of professionalism. The importance of professionalism in the patient/physician relationship cannot be overstated.
- *Professional Respect for Others* is reflected in the respect towards the patients and their families, other physicians and professional colleagues such as nurses, medical students, and residents. It is the essence of humanism, and humanism is both central to professionalism and fundamental to enhancing collegiality among physicians.

## Public Health

The combination of science, skills, and beliefs that is directed to the maintenance and improvement of the health of all the people through collective, organized efforts of society to protect, promote, and restore people’s health. The programs, services and institutions involved emphasize the prevention of disease and the health needs of the population as a whole. Public health activities change with variations in technology and social values but the goals remain the same: to reduce the amount of disease, premature death, and disease-produced discomfort and disability in the population. Public health is thus a social institution, a discipline, and a practice.

## Quality Assurance

A system of procedures, checks, audits, and corrective actions to ensure that all research, testing, monitoring, sampling, analysis, and other technical and reporting activities are of the highest achievable quality. Quality assurance serves to benefit the *quality of care*.

## Quality of Care

A level of performance or accomplishment that characterizes health care. Ultimately, measures of the quality of care always depend upon clinical outcomes or value judgments, but there are ingredients and determinants of quality that can be measured objectively, such as structure, process or procedures, and outcomes.

## Quality of Life

The degree to which individuals perceive themselves as able to function physically, emotionally and socially. In a general sense, it is that which makes life worth living. In a more “quantitative” sense it refers to a person’s time remaining alive, free of impairment, disability, or handicap.

## Reflective Learning Process

An important model of learning that is based on the principle of gaining from the learner’s own experience; this is significantly different from the traditional model of undergraduate medical education. It has very clear links with the model of self-directed learning based on a portfolio which gives evidence of activity, reflection and the outcomes of learning. Students use their knowledge, skills and attitudes to solve problems in the workplace. However, many problems are ambiguous and create surprises. Recognition of these surprises causes the student to review problems and create alternative hypotheses, which is termed “*reflection in action*”. This leads to a search for more information, seeking help from colleagues or experts, reading texts or searching on-line to solve the problem. In order to turn the new information into new learning, a further step is required, which takes place after the problem has been solved: *Reflecting on action*’ involves looking back critically over the initial ‘surprise’ and the resolution of the problem. The process of reviewing and evaluating information leads to learning and this in turn adds to expertise. The process of learning itself tends to generate new questions and motivates the professional to undertake further inquiry, which results in the learning process being determined more by the learner than by the person who designed the activity. This process of reflection provides a stimulus for learning and helps learners to derive maximum benefit from their own experiences.

## Reliability

Trust in the accuracy or provision of one’s results; in the case of tests, it is an expression of the precision, consistency and reproducibility of measurements. Ideally, measurements should be the same when repeated by the same person or made by different assessors. In tests, contributing factors to reliability are the consistency of marking, the quality of test and

test items, and the type and size of the sample. Satisfactory reliability of objective tests can be achieved by having large numbers of well-constructed test items marked by computer. Reliability is characterized by the stability, equivalence, and homogeneity of test.

- *Stability or test-retest reliability* is the degree to which the same test produces the same results when repeated under the same conditions;
- *Equivalence or alternate-form reliability* is the degree to which alternate forms of the same measurement instrument produce the same result
- *Homogeneity* is the extent to which various items legitimately team together to measure a single characteristic, such as a desired attitude.

In a clinical examination, obtaining reliability depends on three variables: the students, the examiners and the patients. Such complexity makes it difficult to reproduce a comparable situation for tests of clinical skill and clinical problem-solving. In a reliable assessment procedure, the variability due to the patient and the examiner should be removed. Wherever possible, a subjective approach to marking should be replaced by a more objective one and students should be tested by a number of examiners. It is important to note that students are usually examined using different patients, which may enhance the performance of some students and harm the performance of others. Therefore, tests which aim to assess clinical skills and clinical problem-solving have to contain many samples of student performance if they are to achieve adequate levels of reliability. The development of the multi-station objective structured clinical examination (OSCE) represents an effort to do so.

### **Reproducibility of Assessment**

Consistency in producing the same results if a test is repeated is a vital attribute of any test. It is important to know that if the same examinees were given the same test after some time and learned nothing in the interim, the same scores would result. Reproducibility is especially important in making licensure and certification decisions.

### **Research**

Scientific inquiry or an organized quest for new knowledge and better understanding, such as of the natural world or determinants of health and disease. Research can take several forms: empiric (observational), analytic, experimental, theoretical and applied.

### **Residency**

The period of training in a specific medical specialty. It occurs after graduation from medical school and

its length varies from three to seven years, depending upon the specialty.

### **Resident or Resident Physician**

An individual at any level in a Graduate Medical Education program, including subspecialty programs. Other terms used to refer to these individuals include interns, house officers, house staff, trainees, or fellows. The term “intern” is often used to denote physicians in their first year of training. The term “fellow” is frequently used to denote physicians in subspecialty programs (versus residents in specialty programs) or in Graduate Medical Education programs that are beyond the eligibility requirements for first board certification in the discipline.

### **Risk Factor**

An aspect of personal behavior or lifestyle, environmental exposure, or inborn or inherited characteristic, which on the basis of epidemiological evidence is known to be associated with an unfavorable health-related condition and considered important to prevent, if possible. It is used as an indication of increased probability of a specified health outcome such as the occurrence of a disease but is not necessarily a causal factor. The term risk factor is further used to mean a determinant that can be modified by intervention, thereby reducing the probability of occurrence of disease or other specified outcomes.

### **Science**

A branch of knowledge that produces theoretical explanations of natural phenomena based on experimentation and observation.

### **Self-Assessment**

The process of evaluating ones own deficiencies, achievements, behavior or professional performance and competencies. Self-assessment is an important part of self-directed and lifelong learning because it creates a need for improvement while it justifies confidence in ones competence.

### **Self-Assessment Questionnaire (SAQ)**

Assessment completed by the learner about him- or herself to provide indirect, inexpensive measures of skill attainment and real-life performance. SAQs serve as an evaluation of ones own deficiencies and achievements, professional behavior, performance and competence. Though important as a tool in motivation for improvement of competence, it has the weakness of being subject to rating biases.

### **Self-Directed Learning**

A form of education that involves the individual learner's initiative to identify and act on his or her learning needs (with or without assistance), taking increased responsibility for his or her own learning.

### **Self-Empowerment**

An event or process whereby an individual or group gains control over decisions and actions affecting their health.

### **Self-Referral**

Ordering of laboratory tests, diagnostic procedures or treatment for a patient by a physician from businesses in which the physician has a financial interest. Many physicians who have such financial interests contend that their participation improves access or quality of care, but results of a number of studies suggest that physician-owned enterprises are detrimental, promoting excessive use of diagnostic tests and treatments and potentially increasing total costs of health care as well as harming the physical and financial well-being of the individual patient.

### **Short-Answer Questions**

An assessment tool that requires students to construct short, written answers to presented questions; often used instead of multiple-choice questions to have students actually recall the answer rather than merely select it from a set of alternatives. As the answers must be constructed, it is reasonable to assume that there is little chance of guessing correctly. The questions are therefore *cued-recall* measures of memory for course material whereas multiple-choice questions require only recognition. Although the stem (question) could be the same in both exam formats and the answer could be quite short, even a single word, the short-answer version is likely to be more difficult than the multiple-choice version. Because the short-answer questions require students to construct answers, they provide more information about the students' knowledge than the selection of a multiple-choice alternative. The disadvantage of this form of exam is related to grading. Question vagueness can yield interpretive problems, and even with quite clear questions, scoring requires assessors with relevant knowledge, judgment and time.

### **Simulated Patient (SP)**

Simulated patients are healthy persons who have been trained to reliably reproduce the history and/or physical findings of typical clinical cases. Sometimes actors are used to accomplish this goal but more often, health care providers are used. Use of an SP is designed to assess students' clinical skills while making the examination as objective as possible. Note

that teaching an SP to simulate a new clinical problem takes eight to ten hours.

### **Simulations and Models**

Tools for assessment of clinical performance in an environment closely resembling reality and imitating real clinical problems to rate the examinees' performance on clinical problems that are difficult or even impossible to evaluate effectively without harming a real patient. They permit examinees to make life-threatening errors and provide instant feedback so examinees can correct a mistaken action.

- *Models* are mannequins constructed to respond realistically to actions, allowing examinees to reason through a clinical problem without risk to a real patient.
- *Simulation formats* have been developed as paper-pencil patient management problems (PMP), computerized versions of PMP called clinical case simulations (CCX), role-playing situations, e.g., standardized patients (SP), clinical team simulations, anatomical models or mannequins, and combinations of all of the above formats.
- *Virtual reality simulations (VR)* use computers sometimes combined with anatomical models to mimic realistic organ and surface images and the touch sensations a physician would expect examining a real patient. Written and computerized simulations have been used to assess clinical reasoning, diagnostic plans and treatment for a variety of clinical disciplines. They are expensive to create.

### **Skill**

The ability to perform a task well, usually gained by training or experience; a systematic and coordinated pattern of mental and/or physical activity.

### **Small Group Teaching**

A very popular form of instruction since it permits the working through of learning material, not just in terms of knowledge but also in terms of attitudes. Within a small group, participants are more likely to exchange opinions and feelings. Usually such sessions are structured with the help of specific exercises such as patient interviews or discussion topics.

### **Standard**

Refers to a model, example or rule for the measure of quantity, weight, extent, value, or quality, established by authority, custom or general consent. It is also defined as a criterion, gauge or yardstick by which judgments or decisions may be made. A meaningful standard should offer a realistic prospect of determining whether or not one actually meets it.

Standards may be *mandatory* (required by law), *voluntary* (established by private and professional organizations and available for use), or *de facto* (generally accepted by custom or convention, such as standards of dress, manners, or behavior).

### Standards in Education

A model design or formulation related to various aspects of medical education and presented in a manner that enables the assessment of graduates' performance in compliance with generally accepted professional requirements. They are set up by consent of experts or by decision of educational authority. Three types of interrelated educational standards can be envisaged:

- *Content standards or curriculum standards* describe skills, knowledge, attitudes and values; what teachers are supposed to "teach" and students are expected to learn. Thus, the content standards define what is to be taught and learned. Content standards can be also defined as "essential (core) requirements" that the medical curriculum should meet to equip physicians with the knowledge, skills and attitudes necessary at the time of graduation.
- *Performance or assessment standards* define degrees of attainment of content standards and level of competencies in compliance with the professional requirements. Performance standards describe how well content has been learned.
- *Process or opportunity-to-learn standards* define availability of staff and other resources necessary for the medical school so that students will be able to meet content and performance standards.

A standard can be also classified four ways:

- *An absolute standard* refers to the knowledge and skills a student must possess in order to pass a given course. An absolute standard stays the same over multiple administrations relative to the content specifications of the test. The failure rate may vary due to changes in the group's ability, from one administration to the other.
- *A relative standard* can be set at the mean performances of the candidates, or by defining the units of standard deviation from the mean. A relative standard may vary from year to year due to shifts in the ability of the group and may result in a fixed annual percentage of failing students, if the scores maintain a normal distribution across administrations.
- *A norm-referenced standard* is a standard based on the representative group of the candidates' population. Credentialing organizations may use norm-referenced orientation, in which the standard is based on the performance of an external large

representative sample (norm group) equivalent to the candidates taking the test. The norm-referenced standard will be somewhat unstable and will shift according to the performance of the norm group, as large as it may be. Shift of the standard over time is a concern.

- *A criterion-referenced standard* is a fixed standard that may undergo periodic re-evaluation in view of shifts or trends in candidates' performance over time. The criterion reference orientation links the standard to the content of the level of competence.

### Standardized Oral Examination (SOE)

A performance assessment using realistic patient cases with a trained physician examiner questioning an examinee in a standardized manner. These exams assess clinical decision-making and the application or use of medical knowledge with realistic patients. The exam begins with the presentation of a clinical problem in the form of a patient case scenario with a request to the examinee to manage the case. An examinee can be tested on a selection of different clinical cases. The examiners need to be trained in how to provide patient data for each scenario, how to question the examinee, and how to evaluate and score the examinee's responses. To create such an exam, extensive resources and expertise are required.

### Standardized Patient (SP)

Individuals who have been trained to reliably reproduce the history and/or physical findings of typical clinical cases. They can be real patients who have been "standardized" or they can be simulated patients, i.e. persons who are not sick but take on a patient's history and role. Sometimes health care providers or actors are used to accomplish this goal. This tool is designed to make examination and assessment of a student's clinical skills as objective as possible. To teach a standardized patient to simulate a new clinical problem takes eight to ten hours.

### Standardized Patient Examination (SPE)

An exam used to assess history-taking and physical examination skills, communication skills, differential diagnosis, laboratory utilization, and treatment. A standardized patient examination consists of multiple standardized patients, each presenting a different condition in a 10-12 minute encounter. The examinee performs a history-taking and physical examination, orders tests, provides diagnosis, develops a treatment plan, and counsels the patient. Using a checklist or rating form, the examiner or the Standardized Patient evaluates the student's performance and behavior. Reproducible scores are readily obtained for history-taking, physical examination, and communication skills. Thorough training of raters, whether they are

physicians, patients or other types of observers, is critical to obtaining reliable scores. Development of such an examination is often time-consuming.

### Subject-Based Teaching

A method of teaching in which each subject area of curriculum is addressed separately. In the past, this model had been very prominent in basic science education. Now, however, it is gradually being replaced with a problem-based learning (PBL) where knowledge and skills unfold as elements in cases that illustrate real life situations.

### Teacher-Centered Education

An educational system in which the teacher dictates what is being taught and how it is to be learned. The teacher is the central or key figure and activities such as the formal lecture and the formal laboratory are emphasized. Individual students have little control over what they learn, the order in which they learn and the methods they must use. In this approach, learning is rather more passive than active. It is the opposite of the learner-centered approach.

### Telehealth

See Telemedicine.

### Telemedicine

The application of communications technologies for the provision of health care services (diagnosis, treatment, prevention of diseases and injuries) over spatial distance in a situation where remoteness and/or availability of professional expertise is a critical factor.

### True-False Items Exam

An exam presenting statements for which students are to choose one of two alternatives, true or false. There are three general weaknesses of this testing method which need to be recognized: a high level of correct responses by chance, ambiguities regarding statements' truth status and varying criteria for marking a statement "true". However, there are methods for addressing each problem:

- First, because of the binary option, the formal chance level of responding correctly is 50%. The high rate of guessing correctly means that a relatively large number of true-false items are needed to allow for reasonable identification of above-chance performance.
- Second, the truth of some statements might be ambiguous, subject to interpretation or dependent on subtle aspects of the statement. To minimize such problems, instructors should keep test statements as clear-cut as possible.

- A third problem concerns individual differences in criterion for judging a statement "true" or "false". Students have varying degrees of confidence that statements are true, so that two students having the same feeling of "degree of truth" about a statement, e.g. "85% true", might well use different criteria, with one marking the statement "true" and the other "false". To provide for maximum discrimination, the test should be constructed so that 50% of the statements are true and students instructed to mark "true" the 50% of statements that seem the *most* true to them.

An important advantage of this exam is that true-false items are easy to construct, easy to score and can cover any sort of content.

### United States Medical Licensing Examination (USMLE)

A 3-step examination procedure that provides a common evaluation system for United States medical licensure applicants. Results of the USMLE are reported to State Medical Boards granting the initial license to practise medicine. Each medical licensing authority requires, as part of its licensing procedure, a successful completion of an examination or other certifications demonstrating qualification for licensure. <http://www.usmle.org/>

### Validity

A term that reflects a solid foundation or justification for bringing the intended results. In the case of assessment, validity means the degree to which a measurement instrument truly measures what it is intended to measure. The establishment of validity is the first priority in developing any form of assessment. Without it, all other attributes are of little consequence. The assessment instrument should accurately represent the skills or characteristics it is designed to measure. Validity may be characterized in these four ways – content, concurrent, predictive or criterion-related validity:

- *Content validity* is the one of greatest concern to teachers as the test must contain a representative sampling of the subject matter the student is expected to have learned. This sampling must be representative and should cross several categories of competence, a range of patient problems and a list of technical skills. Valid clinical examination should assess the components of clinical competence, including the ability to obtain from the patient a detailed and relevant history; carry out a physical examination of the patient; identify the patient's problems from the information obtained and reach a differential diagnosis; identify the appropriate investigations; interpret the results of the investigations; recommend and undertake

appropriate management including patient education.

- *Concurrent validity* considers the degree to which a measurement instrument produces the same results as another accepted or proven instrument which measures the same parameters.
- *Predictive validity* examines the degree to which a measure accurately predicts expected outcomes; for instance, a measure of attitudes toward preventive care should correlate significantly with preventive care behaviors.
- *Criterion-related validity* includes concurrent validity as well as predictive validity.

## Value

A term referring to what people believe in, or what they consider important about the way they live. Values influence behavior and culture as persons, groups and communities. Values therefore are an important determinant of individual and community health. They are, however, difficult to measure objectively.

## Variable

A quantity, attribute, phenomenon or event that may assume any one of a set of values:

- *Independent variable* refers to a characteristic being observed or measured that is thought to influence an event or manifestation (the dependent variable) within the defined area of relationships under study. In medical education, it is a factor that could explain or predict the curriculum's outcomes such as the curriculum itself, previous or concurrent training, environmental factors.
- *Dependent variable* is a manifestation or outcome whose variation we seek to explain or account for the influence of independent variables. It can be a program outcome, such as knowledge or skill attainment, real-life performance, and clinical outcomes.

It is prudent to focus on a few dependent variables that are most relevant to the main evaluation questions and similarly, to focus on the independent variables that are most likely to be related to the curriculum's outcomes.

## World Federation for Medical Education (WFME)

A non-governmental organization with ties to WHO and UNESCO, the WFME is concerned with global education and training of medical doctors and is the umbrella organization for six regional associations for medical education. The WFME's general objective is to strive for the highest scientific and ethical standards in medical education and to take initiatives with respect to new methods, tools and management of medical education. The central office has been located at the University of Copenhagen, Denmark since 1996, in collaboration with Lund University in Sweden.

<http://www.sund.ku.dk/wfme/>

## Written Interactive Test

Allows for assessment of clinical reasoning skills, understanding and knowledge of clinical and basic science and application of basic science to clinical problems. Test methods such as essays and open-ended interviews are used, providing information about the respondent's perceptions, attitudes, feelings, and experiences. Examples of written objective-type tests are MCQ, PMP, MEQ. Such test should be designed to ensure that they are clinically coherent, containing questions from different disciplines, securing an appropriate discipline balance and ensuring that questions and answers reflect reasonable expectations of students. However, these test methods are often subjective and may contain rater biases. Presently, to enhance their validity and reliability, most of above mentioned methods are computerized with the addition of various audiovisual and holographic inputs (computer-interactive tests).

