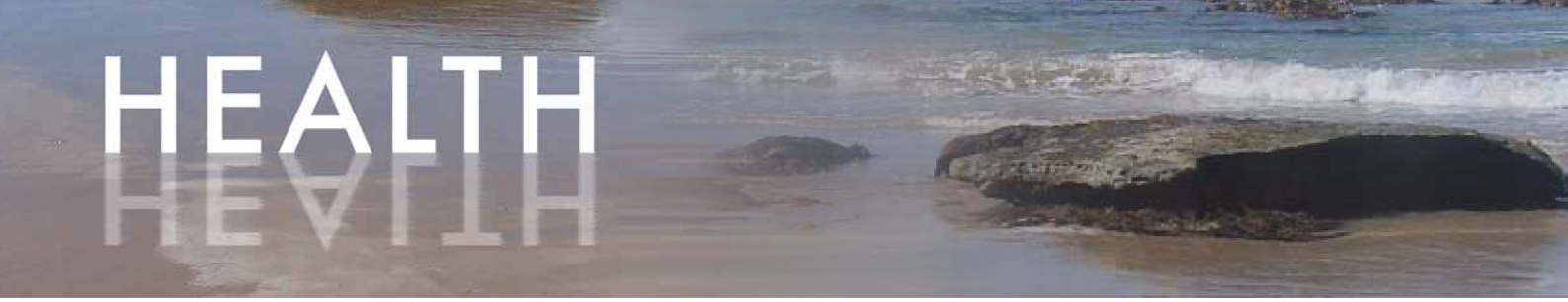

Published in *Health* in 2011 by Future Leaders (www.futureleaders.com.au)

Educating Doctors About Health Promotion and Preventive Care

Leon Piterman

Introduction

The medical profession is perhaps best known for its contribution to curative medicine. Each day we read about advances in medical science driven by groundbreaking research aimed at curing diseases In the developing world infectious diseases such as malaria, tuberculosis, schistosomiasis and the widespread prevalence of HIV and AIDS provide enormous challenges for medical researchers and clinicians. In the developed world chronic and complex disease such as diabetes and ischaemic heart disease and cancer are the commonest causes of morbidity and mortality with mental illness continuing to escalate in both the developed and the developing world as a major cause of disability.

Most patients attending clinicians do so because they have symptoms of an established or evolving illness or disease and justifiably expect a cure or at the very least alleviation of their symptoms. The role of the clinician is therefore largely perceived to be allopathic rather than preventative. The community at large therefore may not appreciate the important role that medical practitioners play on a daily basis in health promotion and preventive care.

In order to gain an appreciation of this role this chapter will explore the nature of health promotion and preventive care, its scientific basis and its application to population health and to clinical practice. Having gained an understanding of the principles which underpin health promotion and preventive care the reader may be in a better position to appreciate the nature of teaching and training practices carried out in medical schools, hospitals, clinics, community health centres and other institutions to train doctors to better carry out their role in the areas of health promotion and disease prevention.

Definitions

Before embarking further it is important to define the key terms used in this chapter .

'Health' is defined by the World Health Organization as a state of complete physical, mental, social, and spiritual well-being and not merely the absence of disease or infirmity. This definition describes the multidimensional nature of health and embraces factors beyond biological disease. It is well understood that there are social determinants of health and that generally speaking people living in relative affluence have greater longevity than those living in poverty. The vast discrepancies in life expectancy between indigenous and non-indigenous Australians, for example, illustrates this very poignantly in our own country. The WHO definition has important implications in medical education. It requires medical curricula to apply a biopsychosocial model to clinical teaching and to clinical practice. This has implications for health promotion and preventive care as it is axiomatic that preventing illness may require social and economic changes as well as dealing with the psychological consequences of physical disease not to mention mental illness in its own right.

This broad definition of health helps us appreciate complex interrelationships between health, illness and disease.

'Illness' refers to the outward expression of physical symptoms, which may occur both in the presence and absence of biological disease. In other words, it is possible to have an

illness without a defined biological disease. In fact, it is said that general practice is marked by the high prevalence of illness and a lower prevalence of disease. Patients presenting with ill-defined headaches, chest pains, muscle aches and pains who have been thoroughly investigated and found to have no demonstrable biological disease, still suffer an illness. On the other hand, there are many patients who may have established ischaemic heart disease or early malignancies without any demonstrable physical symptoms or signs. They have biological disease but no illness. These concepts will become apparent in the later discussion of health promotion, population screening and case finding.

Preventive care, as distinct from curative care, aims to reduce the risk for the development of disease. Its benefits lie not in the immediate improvement of wellbeing of patients with established disease but rather in the long term, preventing the onset of new disease or reducing complications from established disease.

Types of prevention

Primary: this refers to preventing the onset of disease and includes strategies such as immunisation or education for example related to safe sex practices.

Secondary: Refers to the detection of the biological presence of disease prior to the onset of symptoms. Strategies for the implementation of secondary prevention include population screening — for example, for high blood pressure, cholesterol, Pap smears for cervical cancer, mammography for breast cancer, and bone density testing in the elderly for osteoporosis. It also includes case finding of high-risk individuals based on family history — for example, colonoscopy in people with a family history of colon cancer, and more recently, genetic testing for those with a family history of early onset breast cancer.

Tertiary: This refers to preventing complications of existing disease and may therefore include therapeutic interventions. Examples of this include the use of anticoagulants in patients with atrial fibrillation to reduce the risk of stroke, the use of ACE inhibitors in type II diabetes to reduce the risk of renal complications, the use of aids to daily living and environmental support in the elderly to prevent falls.

While most people perceive prevention as preventing the onset of disease few appreciate the importance of tertiary prevention particularly in those patients who are elderly with chronic and complex disease. This is significant as the high cost of health care incurred in this population may be reduced by adequate application of the principles of tertiary prevention.

Health promotion

This consists of a range of activities designed to prevent disease or improve the quality of life of those with established disease. It usually refers to a range of non-medical interventions such as lifestyle change, improved nutrition, exercise, and avoidance of exposure to noxious agents — in particular, cigarette smoking. The strategies for health promotion focus both on a population approach with the aid of social marketing, as well as a practice-based approach directed to patients in the waiting room with the use of health promotional literature, audiovisual material, and multimedia. The population approach does not distinguish between individuals at high risk and those at low risk. For example, campaigns to encourage smoking cessation are screened on television to a wide viewing audience consisting of smokers and non-smokers. On the other hand, health promotion in the clinical environment is focused on the risks and needs of particular individuals, and the distribution of health promotional material is designed to target preventive strategies relevant to that individual; for example, literature to assist smoking cessation, information regarding low-fat diets, or targeted and prescribed exercise programs for patients with established heart disease.

Medical practitioners are therefore more involved with health promotion at the individual level and at a practice level rather than at the population level. However, with the evolution of regional Divisions of General Practice serving populations in excess of a 100,000, some general practitioners (GPs) have become involved in health promotion activities directed to a much larger population. This is usually done in concert with other health professionals and health educators.

Historical basis

Preventive care is nothing new. Isolating individuals with transmissible disease is described in the Bible, where references made to the isolation of those with pustules on the skin for a period of seven days (Leviticus 13, v 9). While it is often thought that this reference relates to leprosy, closer scrutiny reveals that it is more likely to refer to the isolation of people with impetigo or school sores caused by a bacterial organism such as the streptococcus or staphylococcus. The importance of adequate nutrition and the prohibition of consumption of certain foods known to be more likely to transmit infectious diseases also has biblical origins.

Recognition of the importance of sanitation and the possible spread of cholera through contaminated water was well described by Snow in his famous epidemiological study on the Broad Street pump in 1853.

Vaccination or immunisation was first developed by Jenner in the 18th century when he discovered the relationship between cowpox and smallpox. The accidental vaccination with cowpox was shown to prevent infection with smallpox in dairy maids. Smallpox has now been eliminated worldwide through successful vaccination programs.

These examples serve to illustrate the importance of observation in science and acknowledges that some of medicine's greatest discoveries are largely attributable to the observational skills of individual practitioners and scientists.

Scientific basis to preventive care and health promotion

Our approach to disease prevention and health promotion has now become more rigorous and scientific. At the same time we acknowledge that more lives have been saved and continue to be saved through simple preventive strategies such as adequate nutrition, proper sanitation and vaccination than through the total array of medical interventions that we currently have in our armoury.

For interventions to be shown to be beneficial in preventing disease they must withstand scientific scrutiny that demonstrates a sound evidence base for the effectiveness of the intervention. In other words the onus is on the authoritative bodies promoting a particular intervention to provide scientific evidence for its efficacy and effectiveness. For example in order to promote breast screening as an effective intervention for early detection of breast cancer we must have data that it is justifiable clinically if not economically. It is on this basis that the authoritative bodies such as the National Health and Medical Research Council in Australia or similar bodies in other countries may make recommendations for strategic screening programs for the early detection of those at risk or those with early-stage disease. While there is little doubt that blood glucose testing is a reliable screening test for diabetes there may be debate regarding who should be tested, how often, under what conditions, and with what benefits. Therefore while it is reasonable to advocate screening for all adults over 50, it may not be reasonable to do so for adults over 20, particularly if they are not overweight or obese.

The following criteria should be applied to justify screening for medical conditions:

- The condition should be common.
- The condition should contribute significantly to the burden of disease.
- A test should be able to detect the condition earlier than without screening.

- The test should have high sensitivity (few false negatives) and high specificity (few false positives). The test should be valid and reliable, that is it should measure what it purports to measure and should be reproducible on repeated measurements.
- Screening for and treating the disease should have more favourable health outcomes than failure to screen.
- The screening procedure should not cause harm nor create undue anxiety.

Applying these criteria to conditions such as hypertension (high blood pressure) we know from epidemiological studies that the condition is common affecting over 20% of adults aged over 50 in the community. We also know from clinical experience combined with cohort studies carried out many years ago that the condition contributes significantly to the burden of heart disease and stroke in the community. Testing for the presence of hypertension is simple and reliable, and early detection can result in treatment interventions, including behavioural interventions such as weight reduction and alcohol reduction and/or medication that effectively reduces high blood pressure producing favourable clinical outcome in terms of risk reduction for cardiovascular disease. It is therefore advocated that routine screening should be undertaken for hypertension.

Contrasting this approach with the suggestion that population screening be undertaken for brain tumours, for example. Brain tumours are rare, and while if present may be life threatening, on a population basis they do not contribute significantly to the burden of disease. There are no simple or cheap screening tests for brain tumours. CT scanning or MRIs would need to be undertaken, followed by a biopsy, to determine the exact nature of the tumour. This is invasive, and while the test itself may be reliable there is the risk of harm caused by unnecessary biopsies carried out on lesions that are benign or innocent despite their appearance on the scan. Routine screening for brain tumours is therefore not advocated.

It is apparent from the information provided thus far that sensible population screening, case finding, and efficacious and cost-effective interventions can only be recommended and carried out if the profession undertaking these activities is knowledgeable in epidemiology, research methodology and, to a certain extent, in health economics. There is also ethical debate centred on the allocation of limited financial resources to costly screening interventions resulting in even costlier treatments, some of which are either unnecessary or do not result in prolongation of quality life.

Clear guidelines therefore should be provided to the profession regarding what to screen and what not to screen. Medical students, as well as graduates, should have an understanding of the basic science that underpins the creation of these guidelines and have the capacity to critically appraise their value and application in clinical practice.

Teaching of preventive care and health promotion therefore requires an understanding of the disciplines of epidemiology, research methodology, health economics, ethics, and behavioural science. The latter is most important in clinical practice. The purpose of applying the guidelines — in particular, those related to health promotion activities such as promotion of smoking cessation, alcohol reduction, weight reduction, active exercise, and safe sex practices — is to encourage patients at risk to modify their behaviour in order to mitigate the risk. Behaviour change, however, is not a simple process, so that the outcomes of these interventions may be fruitless unless the clinician has learned consultation skills, such as patient-centred motivational interviewing, to enable behaviour change to occur.

Clinical practice guidelines.

Over the past two decades a number of the authoritative bodies have produced clinical practice guidelines to inform clinicians regarding the effectiveness of preventive activities in clinical practice They include recommendations regarding the implementation of these activities including their nature and

frequency. The most notable of these is the report of the US Preventive Services Task Force, originally published in 1989 and updated at regular intervals as new evidence emerges regarding screening; for example, most recently in relation to genetic screening for those at risk for breast cancer or haemochromatosis.

Similar guidelines have been produced by the Canadian Preventive Services Task Force, and in Australia periodic guidelines are also produced by our National Health and Medical Research Council, as well as organisations such as the National Heart Foundation or Anti-Cancer Councils.

These guidelines have been synthesised by the Royal Australian College of General Practitioners into a small volume that is available to all GPs and is regularly updated (*The RACGP Guidelines to Preventive Care* or 'The Red Book').

The guidelines are accompanied by statements regarding the level of evidence for the generation of guidelines as well as the strength of recommendation for their implementation. Level 1 evidence indicates that the guide has been derived from well-designed randomised controlled trials, and strength of recommendation listed means that it is highly recommended. So, for example, periodic blood pressure measurement in people aged over 21 has level 1 evidence and an A rating for strength of recommendation. On the other hand, routine untargeted colonoscopy has level 3 evidence and a C recommendation regarding implementation.

Barriers to health promotion and disease prevention

The implementation of health promotion strategies at both a population level as well as at a clinical level is not simple. In both settings there is a desire to change people's behaviour from an unhealthy or risky lifestyle to a healthy risk-free lifestyle. In some instances, legislation is required to reduce risk in order to bring about effective change within the population as a whole — for example, the wearing of seat belts, driving with blood alcohol levels of less than 0.05,

smoking in public places, safe sex practices among sex workers or those known to be HIV positive.

In routine clinical practice the barriers may be system related, that is, related to the health system as a whole, including funding mechanisms and rewards, doctor related, consultation related or patient related.

As far as system-related barriers are concerned, less than 2% of the national health budget is directly spent on prevention. In general practice, where most prevention is carried out, the government has progressively introduced financial incentives to encourage GPs to undertake immunisation and appropriate screening programs to detect at-risk patients, particularly those aged over 45, the elderly, and those with established chronic disease. This has taken the form of incentive payments under the 'Enhanced Primary Care Package', which includes extra payment for comprehensive health assessments, general practice management plans, and multidisciplinary team care arrangements to enhance the management of patients with chronic and complex conditions. To a large extent, this rewards tertiary prevention in an elderly high-risk group.

Doctor-related barriers are personal and professional. It may be difficult for a doctor who is obese and a smoker to promote a healthy lifestyle to similarly afflicted patients. Some doctors may also challenge the validity of interventions and their self-efficacy in effecting lifestyle change. This applies particularly to dietary advice and exercise prescription in the management of obesity. Many doctors will argue that they have tried before and failed, so why try again.

Consultation-related barriers relate to the shortage of time in a consultation, where health promotion may be last on the agenda when the reason for the consultation was for an unrelated condition. For example, in a patient presenting with acute bronchitis the doctor may be far more likely to deal with the acute problem than to use this opportunity to recommend a Pap smear. Opportunistic preventive care is important

as patient attendance — particularly attendance of male patients — may be infrequent. It should, however, be contextual. So in the case of a patient with bronchitis it may be appropriate to raise the issue of cigarette smoking rather than focusing on the Pap smear.

Patient barriers relate to a reluctance to undertake behaviour change in the face of evidence that the condition requiring management may be dangerous, if not ultimately life threatening. Much of the work regarding behaviour change has been undertaken in the area of cigarette smoking, and it was in this context that Prochaska and di Clementi developed the well-known behaviour change cycle that identifies patients as being in precontemplation, contemplation, preparation for action, in action, in maintenance, or relapsing with regard to a particular behaviour. This cycle is useful in assisting practitioners in identifying the stage of change relevant to the patient, and targeting the intervention to the specific stage within the cycle. For example, if the patient is in precontemplation and has given no thought to smoking cessation then it is unlikely that a detailed intervention at this point in time will be effective. A simple message including some literature may be all that is required on this occasion. If, however, the patient has already contemplated smoking cessation and is seeking help then a far more detailed approach undertaken either by the medical practitioner or with the assistance of a 'Quit' program may bring about rapid behaviour change.

Understanding the cycle of behaviour change, as well as a capacity to appreciate resistance to change and work patiently in a client centred manner over a period of time has been shown to produce effective outcomes. This forms the basis of so called 'motivational interviewing'.

Medical education

Medical students, as well as students undertaking courses of study to become a health professional, must be prepared to participate in lifelong learning. Medical knowledge is not static and increases exponentially each year. Undergraduate

medical education merely prepares students for entry into the profession at a level of competence sufficient to undertake internship training. It is this training, as well as the years of subsequent training and continuing professional development, that equips health practitioners for competent practice and adequate professional performance in the community.

Undergraduate medical curricula

Undergraduate medical curricula in most modern medical schools around the world have undergone considerable transformation and reform over the past decade. The traditional medical curriculum promoted by Abraham Flexner in 1910 consisting of six years of undergraduate study with three years of basic sciences, followed by three years of clinical sciences has progressively become a thing of the past. Modern medical curricula attempt to integrate the teaching of basic science and clinical science, with many courses moving to four years following a three-year undergraduate degree or five-year school leaver entry programs. The teaching of health promotion and disease prevention takes place at various stages within these medical courses, often commencing as early as in the first year of the course with introduction to the basic principles of population health, epidemiology, statistics, research methods and appreciation of the scientific basis to guideline development. In a number of courses (including the one that I'm most intimately involved with at Monash) there are themes that run throughout the course, with health promotion being placed in the theme of population health, but also being taught in the clinical skills component of the program.

Format

It is impossible to describe each of the formats of teaching and learning across a multitude of curricula in Australian medical schools in this short chapter. In using the Monash experience as an example I am merely demonstrating one example of the settings and contexts in which health promotion and disease prevention are taught to undergraduates.

In the first year of the course, students are attached to general practices where they are expected to sit in consultations and observe the spectrum of illness and, where possible, identify opportunities for health promotion and disease prevention in the clinical context.

In the second year of the course, health promotion as part of the theme of population health occupies a significant part of the curriculum, with delivery in both lecture format and small group problem-based learning formats. Lecturers are drawn from the wider community including many of the agencies such as Vic Health, the Anti-Cancer Council, the National Heart Foundation, and a number of social welfare agencies as well.

While gaining appreciation of the science underpinning health promotion, students in the second year of the course undertake a project known as 'The community placement program' where they spend one day for a full semester on rotation to community agencies involved in health promotion and social welfare delivery. They are expected to actively participate in the day-to-day workings of these organisations and to develop team-based health promotion projects supported by an evidence base, and demonstrate the potential effectiveness of these programs in promoting health in community settings. They are then expected to present their projects in poster form at the end of the year, with each poster being judged by an independent panel for their quality, scientific rigour and innovation.

Clinical teaching, particularly in community settings, has a strong emphasis on health promotion, with the focus on the individual patient at risk rather than the population as a whole. Students spend nine weeks in a general practice term in the fourth year of a five-year Monash program, where on clinical rotations they observe the role of individual practitioners, practice nurses, and local Divisions of General Practice in carrying out health promotion and disease prevention activities. In clinical settings, health promotion is often taught

opportunistically in relation to patients presenting with particular problems; for example, patients with obesity, ischaemic heart disease, smoking-related diseases, as well as women attending for regular Pap smears, breast examination and mammography and children attending for immunisation or adults for flu vaccination or pneumococcal vaccination. Teaching in clinical settings is therefore very contextual.

Chronic disease management places a strong emphasis on tertiary prevention. That is, preventing complications in patients with existing chronic disease. Students in the clinical practice setting are exposed to many elderly patients with chronic disease and it is in this environment that exposure to the importance of comprehensive health assessments, risk identification, and general practice management plans that outline strategies for disease prevention and the role of members of a comprehensive health team in promoting these strategies is emphasised. Students are presented with such patients and are expected to develop a chronic disease management plan. For example, this may involve a plan for a diabetic patient who has established vascular problems and needs regular assessment by a team consisting of a dietician, podiatrist, ophthalmologist, diabetic educator and endocrinologist. It is in this context that students learn to appreciate the role of team-based care in maintaining wellbeing, even in the context of established chronic disease.

There are a number of screening programs that are regularly and systematically undertaken in general practice to which students are exposed during their GP term. In relation to women's health, these include Pap smears, mammography, assessment of risk for osteoporosis in the perimenopausal and postmenopausal period. In the case of men's health, they include an emphasis on cardiovascular risk assessment and where appropriate screening for prostate cancer. There are a number of additional specific screening programs related to individuals at risk; for example, faecal occult blood for colonic cancer in patients over 50, particularly those with a family

history; or screening for haemochromatosis in those with a family history. These screening programs demonstrate the applications of health promotion and disease prevention in the clinical context.

Students in clinical settings are expected to engage in consultations with patients who require encouragement to change their lifestyle where risk factors may produce adverse health outcomes. They are observed in these consultations, which may include discussion with adolescents engaging in risky behaviour such as recreational drug taking, consultations with patients who smoke, lack exercise, or whose diet is leading to cardiovascular risk.

Indigenous Australians have a life expectancy that is on average 17 years less than non-indigenous Australians for both males and females. Lifestyle factors including smoking, excessive alcohol consumption, inappropriate diets, lack of physical activity are linked to social and educational disadvantage in our indigenous communities. All Australian medical curricula have an emphasis on indigenous health with teaching of health promotion in a cultural context forming an important part of the curriculum. In most instances this is undertaken by indigenous health professionals with the assistance of indigenous community members, who are able to provide insights into the specific approach needed to engage these communities in health promotion.

Much of the teaching of indigenous health is carried out through rural clinical schools, which form part of the Australian medical school landscape. The degree of direct exposure to indigenous communities will vary between medical schools, depending on their location and their relationships with such communities. For example, in Western Australia, South Australia, and Queensland, the level of student exposure to indigenous settings may be greater than it is in Victoria or Tasmania. In the case of Flinders University, students are rotated routinely to the Northern Territory where considerable time is spent in indigenous health programs.

Many Australians resort to complementary and alternative therapies in an effort to maintain health and wellbeing. The Australian Medical Council, which is the governing body that oversees standards, content and quality in Australian medical schools, mandates that there should be some teaching in all medical curricula regarding complementary therapies, with an emphasis on critically examining the efficacy and effectiveness of such therapies. Such teaching is usually integrated into the programs which deliver health promotion and disease prevention.

Postgraduate training for general practice

Vocational training for general practice in Australia is carried out under the auspices of the General Practice Education and Training Program (GPET) with the Royal Australian College of General Practitioners (RACGP) setting the overarching curriculum. An alternative and complementary curriculum is set by the Australian College of Rural and Remote Medicine. The general practice training program consists of a minimum of 12 months hospital rotations following the internship year and two years of general practice rotations generally in metropolitan and rural sites delivered by accredited training providers in accredited practices under contract with GPET.

The RACGP Curriculum

The RACGP, which sets the curriculum for vocational training, mandates population health and health promotion as one of the five domains of general practice training. These domains include:

- communication skills and the patient-doctor relationship
- applied professional knowledge and skills
- population health and the context of general practice (includes epidemiology, public health, prevention, family influence on health, resource utilisation)
- professional and ethical role
- organisational and legal dimension.

Training is largely done in clinical settings in accredited practices and under the supervision of accredited GPs. This is supplemented with educational release programs, lectures, online learning, and local group meetings and seminars. The training programme requires all participants to sit for a fellowship exam at its completion and gaining of a fellowship is essential for recognition as a qualified GP.

The application of the principles of health promotion and disease prevention is therefore learnt very largely in clinical settings and is examined in similar settings in structured examinations involving real or simulated patients.

The *RAC GP Guidelines to Preventive Care* form the basis for the application of policy into clinical practice. It is essential for medical graduates in training, as well as doctors in practice, to demonstrate adherence to these guidelines in clinical decision-making in relation to health promotion or disease-prevention activities. For example, it would be inappropriate to recommend PSA testing for all males at any age. Should medical practitioners be found to be ordering an inordinate number of PSA tests contrary to the guidelines, the Health Insurance Commission may in the first instance counsel them regarding over-servicing, and if these warnings are not heeded then action may be taken that may result in litigation and restrictions placed on clinical practice.

Training for public health medicine

A number of medical graduates may wish to pursue careers in public health rather than clinical practice, or indeed to blend a career in both disciplines. These doctors will usually undertake a structured training program, including a Master of Public Health (MPH) degree that leads to a Fellowship of the Faculty of Public Health Medicine of the Royal Australian College of Physicians(FFPHM RACP). Clinicians undertaking such programs may be employed in government or non-government agencies charged with the task of carrying out population-based health-promotion activities in community settings. This includes Federal and State health departments, and a range of

NGOs working in the field of health promotion such as the National Heart Foundation, The Brain Foundation, Diabetes Australia, Anti-Cancer Councils. Most medical schools conduct MPH programs that are open to medical and non-medical graduates. While these programs may have a common core, including epidemiology, biostatistics, research methodology, medical ethics, they usually contain specialist streams that may include occupational health, nutrition, health policy, and health promotion so graduates may specialise within their MPH program.

Continuing professional development

It is essential for all health practitioners to remain up-to-date with changes in knowledge, skills, health policy and practice. A vocation as a health professional therefore mandates lifelong learning. Medical practitioners need to provide evidence of continuing professional development in order to maintain their registration. In the case of GPs this involves three-year cycles with a minimum requirement of 130 points of approved continuing professional development gained through a range of mechanisms, with less than half of these points being obtained through attendance at lectures.

Doctors may therefore attend conferences, seminars, workshops, or undertake online learning where the emphasis may be on improving health promotion related to particular disease areas. For example, courses on diabetes, cardiovascular disease, obesity management, cancer, degenerative bone and joint disease would all contain elements of health promotion and disease prevention. Some practitioners may place special emphasis in gaining skills to promote behaviour change. This may involve training in motivational interviewing. Medical practitioners also undertake courses in stress management and in the use of complementary therapies as an adjunct to their routine traditional methods of managing patients with established disease or risk factors for disease.

References

Australian Institute of Health and Welfare. Australia's Health 2008: The eleventh biennial health report of the Australian Institute of Health and Welfare. Canberra: AIHW, 2008.

Enhanced primary care: Standards and guidelines for enhanced primary care Medicare Benefits Schedule items. Canberra: Dept Health and Aged Care, 2000

Jekel JF, Katz DL. Elmore JG. Epidemiology, Biostatistics and Preventive Medicine (2nd ed). Philadelphia: Harcourt Health Sciences, 2001.

RACGP guidelines for preventive activities in general practice (The Red Book; 7th ed) Melbourne: RACGP, 2009.

U.S Preventive Services Task Force. Guide to clinical preventive services (3rd ed). Baltimore: Williams and Wilkins, 2000.

Wylie A, Holt T(eds). Health promotion in medical education: from rhetoric to action. Oxford: Radcliffe Publishing, 2010.

Leon Piterman is Pro Vice-Chanceller Berwick Campus, Monash University. He established Australia's largest and most successful Diploma/Masters Program in Family Medicine. He is a member of the Panel of Examiners of the Australian Medical Council and the Royal District Nursing Service Board. He sits on or chairs a number of university and professional committees related to research, teaching or educational administration.