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POLICY BRIEF 14

How to create conditions for adapting physicians' skills to new needs and lifelong learning

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How to create conditions for adapting physicians' skills to new needs and lifelong learning

Contents

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Key messages

Policy issue and context

- The knowledge and skills acquired at the end of formal undergraduate and postgraduate professional medical education are insufficient to sustain competence and performance over a career, thus physicians are expected to effectively engage in lifelong learning strategies.
- There is increasing scrutiny of professional and public concerns related to the variability in the quality of care provided, the safety of the health system, and the frequency of adverse events.
- Within Europe there is currently no commonly accepted approach to lifelong learning. However, there is broad agreement that patients are best served when those who care for them maintain competence by engaging in continuous learning and assessment strategies.
- There are currently no standards governing the following lifelong learning strategies: the organization and management of activities; incentive structures for participation; classification systems for activities or credits; accreditation standards; physician discretion regarding choice of learning activities; accreditation ex ante for providers; and industry sponsorship.

Policy options

- Discordance between the expectations of patients and the abilities of physicians are prompting the profession to strengthen assertions of "professionalism". To increase accountability, compulsory engagement in continuing professional development (CPD) systems or programmes can be considered.
- It will be important to both enhance and ensure the quality and rigour of the providers or programmes that physicians depend on to develop and implement a practice-specific, needs-based learning plan. The development of a common CPD accreditation system for providers and programmes is deemed essential.
- To address barriers within the health care system and to optimize the benefits of lifelong learning for patient care and outcomes, physicians, providers of CPD, and the health care system itself need to take a "shared responsibility" approach to lifelong learning and CPD.

Implementation considerations

- If the goal of CPD systems is to improve the delivery of good-quality patient care and thus improve patient outcomes, the environment in which physicians practice should be both supportive and constructed in a way that promotes and enhances learning.
- In the European Union (EU), the diversity of CPD systems is increasingly becoming a barrier to those in pursuit of harmonization of CPD across Member States. In order to build equivalent and successful national CPD systems, infrastructure considerations must include the following: mutual agreement and recognition of CPD; uniformity of accreditation standards; efficient and accessible delivery mechanisms for CPD; equivalent standards for industry sponsorship allowances; and performance-assessment metrics.

Executive summary

Policy issue

The knowledge and skills acquired at the end of formal undergraduate and postgraduate professional medical education are insufficient to sustain competence and performance over a career. Either through participation in organized continuing education programmes or through individual learning activities, health care professionals are expected to remain current in their practice through efficient knowledge-management practices (evidence-informed practice) and self-directed learning strategies (lifelong learning).

Health care professionals are expected to engage effectively in lifelong learning strategies in rapidly changing health care systems that are increasingly strained due to funding constraints, inadequate health care workers (e.g. too few workers, the wrong skill mix) and limited access to data on performance or current health outcomes. Further compounding these challenges is the increasing scrutiny of professional and public concerns related to the variability in the quality of care provided, the safety of the health system and the frequency of adverse events.

Within Europe, there is currently no commonly accepted approach to lifelong learning. However, there is broad agreement that patients are best served when those who care for them maintain competence by engaging in continuous learning and assessment strategies.

With regard to the EU, despite the increasing importance of continuing medical education (CME) and the implementation of revalidation among some Member States, information pertaining to country-specific engagement in CME remains elusive. The diversity of CME regulations across EU countries is challenging any attempts to harmonize physician learning and practice across the EU. Although CME will probably remain a national responsibility, there are currently no standards governing physician learning post licensure.

Policy options

The gap between the expectations of patients and the abilities of their physicians are challenging the relationship between the public and the profession. These gaps have prompted the profession to strengthen assertions of "professionalism" and promote the development of programmes of continuous learning to enhance accountability for the maintenance of competence in practice.

If mandatory participation in continuous learning is deemed to be a value for the profession and the public, the ways in which such systems evolve across the EU will not necessarily look the same for all physicians.

Ideally, systems of CME should (among other things) support the development of lifelong-learning skills and competencies, be relevant to the practice profile of each learner, address the perceived and unperceived needs of each learner's professional practice, and include continuous assessments of how the individual learner or the health care team is performing. As such, advocating for participation in compulsory systems of CME is based on a public expectation, a professional imperative and a regulatory requirement.

Within medical undergraduate and postgraduate educational systems, accreditation methodologies have been developed and implemented on the basis of an established set of principles, standards and metrics. Several national systems have developed accreditation systems focused on the providers of CME, the individual programmes or activities, or both. Accreditation systems relating to CME activities are typically based on a set of standards that articulate the educational and ethical requirements that must be met in order for an activity to be included within a system of CPD or to qualify for credits.

Within the EU specifically, there is an opportunity to promote mutual recognition of national CME accreditation systems across Member States. Mutual recognition could be developed in such a way that all CME accreditation systems would be required to be same, or "substantively equivalent". Substantive equivalency is based on the ability of each system to reflect a common set of principles, values and metrics.

Regardless of the scope of learning activities included within national CME frameworks of learning, or the number of credits expected to be achieved, the process of substantive equivalency is based on the ability of CME systems to demonstrate how these principles, values and metrics are implemented and expressed within each system.

Physicians encounter a range of potential barriers that might prevent them from optimizing care based upon CME activities. These may occur at a variety of levels (e.g. structural, organizational, peer-group, individual) and for a variety of reasons (e.g. information overload within busy consultations leading to acts of omission, patient expectations).

To address these barriers and optimize the benefits of lifelong learning for patient care and outcomes, physicians, providers of CME and the health care system itself need to take a "shared responsibility" approach. Health care systems can support the lifelong learning activities of physicians and CME providers by creating (and supporting) an environment that is conducive to learning. Educational and health systems must provide an infrastructure supporting a range of activities that can be used by physicians and health teams to assess their performance in practice.

Implementation considerations

The diversity of CME systems within the EU is increasingly seen as a barrier to the overall pursuit of harmonization of CME across Member States by those who would favour this approach. In order to build equivalent national CME systems, several infrastructure issues require consideration.

All physicians, stakeholders and medical societies in any Member State must jointly recognize that engagement in formal CME and, more broadly, lifelong learning is an accepted and necessary professional and ethical obligation. Collaborative agreement (across Member States) regarding the value and professional ethic of engaging in CME is an essential foundation.

Uniformity of accreditation standards must be established to ensure that physicians can confidently train across borders. Uniformity should exist for the principles and outcomes of accreditation of CME providers and organizers. This uniformity would ensure that physicians seeking educational activities not provided within their own country would be similarly equivalent with regard to educational components, outcomes and quality.

A national method for tracking activities and learning outcomes (e.g. a centralized electronic recording mechanism) is a requirement. As with delivery of CME, the expectation would be that tracking mechanisms should be designed specifically to fit into the economic, social, cultural and technological infrastructures of each country.

Commercial sponsorship of CME activities has gained increased attention in the last 10 years. There is a view that CME has become too reliant on industry support; consequently, Member States will need to consider national models that either disallow sponsorship entirely or allow it provided that the sponsor does not have control over the educational agenda or activity-level accreditation.

Physician assessment must be embedded within – and be supported by – the practice context and the relevant health system. Assessment must be viewed as a formative process designed for the purpose of identifying areas of practice upon which further learning should be focused. Therefore assessment must occur in an environment that is safe both from threats of litigation and fear of failure.

Policy brief

Policy issue: keeping physicians' skills current and relevant to modern practice

The proliferation in the volume and complexity of biomedical information and technologies poses a major challenge to health care professionals' ability to provide high-quality, up-to-date health care. The knowledge and skills acquired at the end of formal undergraduate and postgraduate professional medical education are insufficient to sustain competence and performance over an entire career. Through participation in organized continuing education programmes or through individual learning activities, health care professionals are expected to remain current in their practice. Moreover, they are expected to engage effectively in lifelong learning strategies in rapidly changing health care systems that are often increasingly strained due to insufficient funding, health workforce concerns (staffing levels and quality) and limited access to data on performance, practice or health outcomes. Further compounding these challenges is the increasing scrutiny of physicians' activities and public concerns relating to variability in the quality of care provided, the safety of the health system and the frequency of adverse events. Collectively, these concerns have fostered a growing emphasis on the need for accountability within the health professions, to balance continuance of the privilege of self-regulation.

This Policy Brief examines the key measures necessary for creating the conditions that allow physicians to adapt their skills in the context of professional needs and lifelong learning. It outlines the reasons why a reconsideration of lifelong learning practices in Europe is needed at various levels (i.e. learner, organization, and systems) and it explores the policy options, conditions and incentives involved in updating the knowledge and skills of any health workforce. While the focus here is on physicians, many of these concepts are transferable to other health professionals as well. This Policy Brief specifically examines the options for collaboration across countries, including strategies for promoting the transmission of learning, training and new forms of knowledge across national boundaries within Europe (with particular reference to the EU Member States).

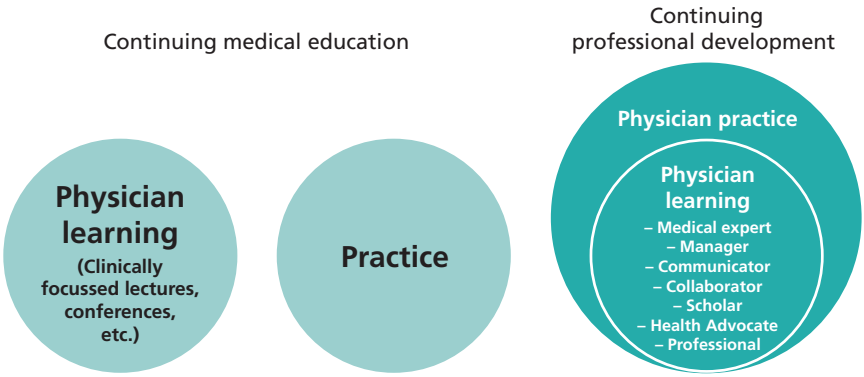
A shift from CME to CMD

The updating of knowledge and skills for physicians is not new, and is widely recognized as an element of professionalism in medicine. However, the need to maintain clinical competence is subject to increasing scrutiny, fuelled in recent years by patients' growing expectations for the following: better communication and collaboration among physicians and health professionals; a greater role for physicians in the screening and prevention of disease; the timely incorporation

of evidence-based research into clinical practice; the linking of financial incentives to high-quality care; and the use of CME for licensure *(1)*.

Because learning during formal training is no longer adequate to sustain competence until retirement, physicians must engage in learning activities (CME). Historically, the CME learning model has perpetuated learning as an adjunct to daily practice (an "add-on"). Physicians have commonly regarded learning as something outwith their practice, for example, attending a conference or lecture (Fig. 1). This model of CME includes a number of educational strategies designed to keep physicians updated regarding new diagnostic approaches, the management of clinical conditions and the development of new technologies that are wholly separate from the clinical environment and health care system. Within this traditional model, measurement approaches are primarily focused on participation in group learning activities rather than on "learning or competency-based" outcomes. CME has been criticized for consistently limiting evaluation simply to satisfaction with the learning activities rather than any rigorous measurement of gains in knowledge or technical skills, improved performance and, more importantly, improved patient outcomes. There has also been a failure to recognize that different physicians have differing learning preferences and, as such, require different learning strategies and approaches.

Fig. 1. Traditional CME versus CPD



Over the last 10 years, there has been increased use of the concept of CPD to promote a new model of learning that engages physicians in study across a broader range of competencies (i.e. beyond clinical skill alone). Such competencies are considered to be more relevant and realistic *vis-à-vis* the range of skills required for delivering quality health care. This evolution in terminology from CME to CPD has grown out of increased recognition of the

limitations of the effectiveness of traditional CME as a learning strategy, and of the dependence of quality care on multiple competency domains, not just medical knowledge. For CPD to be effective, physicians will require continuous learning across multiple competencies, using a variety of educational approaches, but it will also be necessary for the educational strategies to be closely linked to both clinical needs and the needs of health care systems.

Additionally, there is increasing recognition that a physician's practice environment is rich with opportunities for identifying gaps in knowledge, for generating and resolving questions relating to practice, and for developing self-assessment strategies (e.g. review of practice performance data, comparison with colleagues). Furthermore, there has been a philosophical change regarding how physicians should learn, emphasizing learning within a "learning community" (e.g. a group of individuals with common values and beliefs) or team; in fact, professional isolation has been identified as an obstacle, not a strength, of physician learning in practice *(2)*.

Academics and educators in the CPD community have increasingly seen this type of professional development as a shared responsibility between the individual learner (e.g. health care professional), CPD organizations (e.g. accredited providers, educators) and health systems (e.g. primary care practices, hospitals). If the goal of CPD systems is to improve the delivery of care and thus improve patient outcomes, the environment (e.g. hospital, clinic, emergency department) in which physicians practice should be both supportive and constructed in a way that promotes and enhances learning (e.g. by providing physicians with access to evidence-based point-of-care information). In addition, as physicians work in complex environments, it is important to ensure that they themselves – and also the organizations and health systems – are adaptable and flexible.

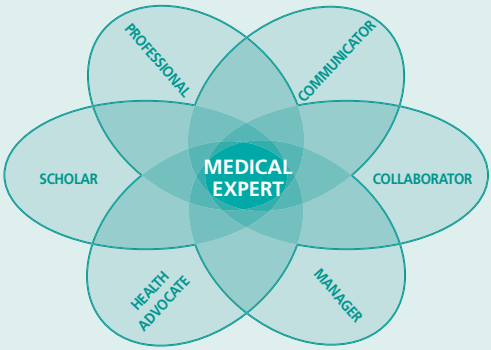
Learning can take many forms: for example, physicians can engage in learning that is individualized or constitutes part of a learning community; it could be unplanned (e.g. resulting from a critical incident) or strategic (e.g. pursuing a question); it could be focused on personal or organizational accountability; and it could be assessed from a learner perspective (e.g. learner-centred) or within a team (e.g. 360-degree assessment that integrates self-assessment, peer assessment and patient assessment in order to inform providers). Planning or assessment of CPD models should involve the consideration of a number of factors, including (but not limited to) social, cultural, financial, environmental, political, gender, and other contextual, issues.

Although there has been moderate progress towards change, as well as a growing emphasis towards learner-centred language, the historical notion of continuing education – in which learning is part of a structured delivery system and is an adjunct to daily practice – generally prevails *(3)*.

In view of this shift in approach and an increased recognition of the complexities of physician practice and scope, it is important to view physicians' learning and updating of skills as a continuous process, i.e. "part of the job". In this respect, a prominent discourse in education policy is the concept of lifelong learning. For the purposes of this Policy Brief, "lifelong learning" (a term that is often poorly defined) is "a continuously supportive process that stimulates and empowers individuals (physicians and other health professionals) to acquire all the knowledge, values, skills, and understanding they will require throughout their lifetimes" and which enables the application of these skills "with confidence, creativity, and enjoyment in all roles, circumstances, and environments" *(4)*. This definition highlights the process involved in continuously seeking, acquiring, renewing and upgrading knowledge, skills and attitudes. Whilst there is no agreed method for becoming an effective lifelong learner, as a general principle, it is clear that physicians learn best when their preferred style is matched with appropriate learning methods *(5)*.

Box 1. The CanMEDS 2005 Physician Competency Framework

The CanMEDS Physician Competency Framework – first developed by the Royal College of Physicians and Surgeons of Canada in the 1990s and updated in 2005 *(6)* is an example of a concrete CME framework that addresses multiple competencies in practice. The diagram below illustrates the domains, interconnections and overlaps of the six CanMEDS roles (communicator, collaborator, manager, health advocate, scholar, and professional), which together amount to the competency of a "medical expert" *(7)*.



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- As ***medical experts***, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills and professional attitudes in their provision of patient-centred care. *Medical expert* is the central physician role.
- As *communicators*, physicians effectively facilitate the doctor–patient relationship as well as the dynamic exchanges that occur before, during and after the medical encounter.
- As *collaborators*, physicians work effectively within a health care team to achieve optimal patient care.
- As *managers*, physicians are integral participants in health care organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the health care system.
- As *health advocates*, physicians use their expertise and influence responsibly in order to advance the health and well-being of individual patients, communities and populations.
- As *scholars*, physicians demonstrate a lifelong commitment to reflective learning, and to the creation and dissemination, application and translation of medical knowledge.
- As *professionals*, physicians are committed to the health and well-being of individuals and society, through ethical practice, profession-led regulation, and high personal standards of behaviour.

The CanMEDS framework was written by physicians, for physicians. It is predicated on meeting societal needs, and its ultimate goal is universal across health care jurisdictions – optimal patient care (6). This competency-based framework can be used as a support for policy-makers and stakeholders when determining effective ways of working with physicians and those engaged in the pursuit of high-quality health care (6).

The European context

Despite the increasing importance of CME (as it is generally referred to within the EU; herein the approach is referred to only as CPD) and the implementation of revalidation among some EU countries, country-specific data remain scarce. What is well understood, however, is that CPD regulations across EU states are currently diverse. Although CPD will probably remain a national responsibility, there are currently no standards governing the following: the organization and management of activities; incentive structures for participation; classification systems for activities or credits; accreditation standards; physician discretion regarding choice of learning activities; accreditation *ex ante* for providers; and industry sponsorship *(8)*.

In an attempt to ensure physician competence, revalidation initiatives have been introduced into professional regulation systems in some countries. The purpose of physician revalidation is to reaffirm that physicians' competence and performance are maintained in accordance with a set of pre-specified

professional standards. The demonstration of physicians' ongoing competence and performance – obtained by means of CME programmes (or systems committed to these values and principles) – is a pillar of professional self-regulation.

The governance of CPD systems is equally heterogeneous, occurring at either regional or national level, although national-level governance is more common. Within Europe, professional medical bodies or insurers regulate lifelong learning by using a mix of stakeholders to ensure that standards are maintained. The different roles of public authorities and medical associations in individual Member States, coupled with language challenges, increase the complexity of the CPD system in the EU.

Most countries have adopted a system that requires health professionals to complete a certain number of credits within a given time period that ranges, across states, from one year (Belgium) to five years (France). However, although many countries have adopted a compulsory approach (for example, France, Italy, Austria, the United Kingdom, Croatia, Hungary), in many cases this approach describes a process orientation rather than a regulatory system: no formal consequences exist when physicians are non-compliant. However, there are several exceptions to this rule, including Croatia (failure to comply requires an examination before practice can continue), Germany (reduced reimbursement; after 2 years, accreditation is withdrawn), Hungary (failure to comply requires a special examination before a commission), the Netherlands (removal from the medical registry), Romania (revoking of practice rights), Slovenia (re-examination), Switzerland (loss of membership of the Swiss Medical Association) and the United Kingdom (practice supervision). Financial incentives for revalidation exist for Norway (for specialized general practitioners only) and Belgium (only for non-hospital physicians). Various forms of sponsorship of CPD events are allowed (except in the case of Norway), provided that conflicts of interest are clearly declared and advertising during events is strictly prohibited.

Professional and patient mobility is also gaining increased attention. There are concerns regarding how best to ensure the competence of physicians licensed to practice in one Member State when they elect to practice in another. Additional challenges faced by EU Member States include the failure of the European legal framework to recognize the introduction, in a number of countries, of periodic validation and a requirement to participate in CPD *(9)*. For this reason, revalidation in the EU is gaining increased attention.

Further compounding these challenges is the desire for, and increase in, access to online material. With the introduction of the World Wide Web as a vehicle for engaging in lifelong learning, CPD activities are no longer constrained by geographical limits. Consideration needs to be given to the principles, values and metrics whereby physicians who engage in CPD in one Member State can

include this learning within the requirements of the state in which they are currently practising.

What we see, therefore, is that within Europe there is currently no commonly accepted approach to lifelong learning. However, there is broad agreement that patients are best served when those who care for them maintain competence by engaging in continuous learning and assessment strategies. Optimally, these strategies would be "highly self-directed, with content, learning methods, and learning resources selected specifically for the purpose of improving the knowledge, skill, and attitudes that physicians require in their daily professional lives that lead to improved patient outcomes" *(10)*. Lifelong-learning policies also need to be developed to reflect changing economic, political and social landscapes: for example, they might need to incorporate efficient approaches to the maintenance and improvement of skills in an ageing health care workforce that is currently faced with rapid technological advances and organizational restructuring.

In taking the discussion forward, the next section addresses the following questions.

- What skills might physicians require in the future in order to be "good lifelong learners"?
- What are the specific needs and issues that might trigger reconsideration of lifelong-learning concepts and processes in Europe?
- Are there models or frameworks for CPD that could be used as platforms for developing new (or modifying existing) models of lifelong learning in Europe?

Ensuring quality of care using lifelong-learning strategies

What skills might physicians require in the future in order to be "good lifelong learners"?

To begin to develop a model for lifelong learning that would be relevant across the EU, one must understand the basic skills that physicians require in order to be "effective" as learners. These skills can then be translated into needs at the individual level, at the level of the organization providing the CPD, and at systems level (i.e. in relation to policy options and implementation).

Advocates of the lifelong-learning approach argue that physicians can be effective lifelong learners only if they enter practice with a defined set of learning competencies. Examples of such competencies have been outlined by the Working Group for Pursuing Excellence in Practice (A CanMEDS Scholar Workshop on Lifelong Learning) *(11)*. These competencies enable physicians to draw upon practice experiences to critically assess and revise their practice

through a process of reflection that enables one to "make sense of complex situations" and "learn from experience" *(12)*. In the last 10 years, increased attention has been given to the modification of medical programmes in order to address some of these competencies. This has provided great opportunities for organizations, specialty societies and accredited bodies to consider increasing their CPD activities. The learning competencies outlined by the Working Group – suggested as requirements for practice – can be divided into five categories, as described below.

Knowledge of the physician's practice profile

The first learning competency is the ability to create and use a practice profile that describes the problems and issues within one's own practice. The development of a practice profile enables a physician to develop a learning strategy that can be specifically linked to his/her practice *(13)* as part of the broader context within the health care system. This competence enhances a physician's ability to engage in learning activities that are relevant to his/her day-to-day work as an individual learner and as a part of a health care team. For most physicians, the numbers and types of clinical problems they assess, diagnose and manage will have a profound influence upon their lifelong learning strategies. However, learning can be linked to other dimensions of professional life, such as education, research and administration (for example, medical ethics, risk management, patient safety, office management and health advocacy).

The creation of an accurate practice profile requires the review and integration of a diverse set of data sources such as electronic health records, patient registries and claims data. From these data sources, physicians should also have access to various types of reliable data, including patterns of practice and prescribing, performance levels, critical incidents, etc. Practice profiles enable physicians to select appropriate learning activities (for example, where gaps in knowledge may exist), create measureable learning objectives and achieve relevant outcome measures. As a physician's practice evolves throughout his/her career, a practice profile requires continual reassessment and updating. A physician's knowledge of his/her practice could be facilitated by the health system, through the provision of audit and feedback data.

Scanning the environment

The second learning competency is the ability to systematically and effectively scan one's environment for new and relevant ideas. Examples include the ability to identify innovations at the development stage, to identify new evidence that has been reviewed and approved by the profession (for example, practice guidelines) and to identify old practices that should be discontinued because they are either no longer effective or potentially harmful.

At the individual level, physicians are confronted by a "sea" of information that is scattered among thousands of journals, textbooks, monographs, reports and guidelines *(14,15,16)*. A systematic approach to scanning enables physicians to filter information on the basis of relevance and validity, ensuring that they are reviewing the most clinically useful information *(17)*. Examples of this include electronic knowledge dissemination strategies that push summaries of relevant or critically appraised literature, drug alerts or practice guidelines. Scanning could also include reminder systems within electronic health records, attendance at rounds or conferences, or sharing of ideas with peers, colleagues or other health professionals who have similar or shared practices.

Managing knowledge in practice

The third learning competency is the ability to establish a personal knowledge-management system that forms the foundation for information literacy. For example, learners could set up "RSS feeds" (personalized web information tailored by the individual physician): this system would provide the latest information relevant to the individual physician's practice profile, and would use online bibliographic databases that can categorize and store records for easy retrieval. For this to work effectively and efficiently, organizations need to ensure that the proper resources are in place. At the very least, for example, physicians would need ready access to computer systems, access to key evidentiary resources (e.g. the Cochrane Collaboration), point-of-care tools (e.g. electronic database search tools) and other technologies linked to internet-based resources. The development of theory-driven educational materials, online courses, learning booklets and other forms of educational tools designed to educate physicians about how to manage their practice is essential. Again, learning should be viewed as an imperative shared by all components of the system (the individual, the organization providing the CPD, and the health system). Each of the component parts should be complementary to the others, rather than acting as a barrier to learning across the system as a whole. Criteria could then be established concerning which journal articles should be read in depth (as opposed to just scanned), and linked to the use of a learning portfolio designed to select and manage learning projects that support continuous practice improvement. Finally, online discussion forums provide a means of exchanging new information and ideas for enhancing practice.

The rapid expansion in medical knowledge has meant that physicians must be capable of adapting to change and continuously improving their performance *(18)*. The ability to establish and implement a personal knowledge-management system (selection of reading matter, management of resources for effective learning at work, the keeping of records that describe personal expertise) is a key competence. Physicians require training in order to set up these types of personalized learning portals where knowledge that is specific to the needs

of individual can be "pushed" towards them or can be quickly "pulled" from online sources *(19,20)*.

Raising and answering questions

The fourth learning competency is the ability to formulate "good" questions and demonstrate ways of translating these questions into learning opportunities. Question-asking is a frequent and natural activity of physicians *(21)*. Some questions reflect an immediate need to resolve uncertainty or solve a problem. For example, during the care of an individual patient, the creation of a question frequently reflects a need to acquire evidence in order to make a decision. Other questions are not time-sensitive and are generated to gain greater conceptual understanding or are based simply on an attitude of curiosity. Questions can be stimulated by a spectrum of activities (e.g. attending rounds, reading the literature, teaching, or reviewing performance data) and can identify learning needs across multiple competencies.

As physicians learn best when the learning is contextual, addresses a defined need and is directly relevant to their work *(22,23)*, the ability to raise and answer a well-formulated question is a central learning competence. Unfortunately, many questions raised in practice go unanswered because of a lack of access to knowledge resources at the point of care, a lack of time to search for evidence, and the challenge of formulating answerable questions *(21,22)*. Therefore a shared responsibility between individuals and organizations could be envisaged whereby organizations ensure that "learning resources" (e.g. access to the internet and relevant learning materials such as medical journals and online courses) are made readily accessible.

Access to – and promotion of – the use of question-formulation tools such as PICO (Population, Intervention, Comparator, and Outcome) may assist in defining search strategies and in the analysis of evidence in clinical areas *(24,25)*. Implementation of centralized registers, strategies and/or tools designed to record, track and resolve (make sense of) questions may facilitate the appraisal of knowledge and its translation into practice.

Practice assessment and enhancement

The fifth learning competency is the ability to use processes and tools to continuously assess and measure the impact of learning on enhancement of knowledge, skills and performance in practice. From an individual/team perspective, assessment is an essential component of effective individual or group learning in that it allows individuals or health teams to answer the question "Is/are my/our knowledge and abilities up-to-date?" Assessment strategies include knowledge assessment through multiple-choice or short-answer questions,

simulation (using standardized patients, high-fidelity mannequins or computer-based simulation), direct observation and the audit and feedback method.

Organizations and health systems should be strongly encouraged to develop and promote processes that provide meaningful data and feedback to learners in order to identify gaps (with or without comparative data from other physicians with comparable practices) that enable the identification of otherwise unperceived needs. CPD plans resulting from such assessment strategies contribute to the achievement of measurable outcomes.

Physicians' use of data to improve competence and performance remains infrequent *(26)* and their own assessments of their strengths and weaknesses in areas of knowledge, skills, attitudes or performance are often inaccurate *(27)*. Comparisons between physician's self-rated assessments and external observations demonstrate little or no correlation, or show an inverse relationship *(28)*. The physicians with the worst levels of accuracy in terms of self-assessment were shown to be the least skilled and the most confident *(29)*. These studies support the need to develop new initiatives and formats to improve the self-assessment process and to assess broader domains of competence (such as lifelong learning) more accurately *(27)*.

To address gaps in knowledge, skills or performance, physicians must have both the opportunity and the ability to engage in – or plan – assessments of their professional practice, they must measure their performance against specific standards of care and they must then translate their findings into actionable plans. Unfortunately, no assessment option is uniformly effective, and the mean improvement in performance with existing approaches is modest (typically 5–10%) *(30)*.

It is imperative that policy options incorporate these areas of competency in order to ensure that there is a shared responsibility between the individual physician, organizations that develop CPD resources (e.g. specialty societies), and the health system (e.g. hospitals or regional regulatory authorities).

What are the specific needs and issues driving the review of lifelong learning concepts and processes in Europe?

The effectiveness of CPD systems in engaging physicians in learning that is directly linked to improved patient care remains uncertain. There is currently no consistent strategy or agreement regarding how continuous learning in practice should be organized, structured, delivered, documented and regulated. However, the specific needs and issues driving the necessity for reconsideration of lifelong learning concepts within Europe – and the EU specifically – are summarized below on the basis of the key themes emerging in the literature *(1)*.

Participation in lifelong learning activities: compulsory versus voluntary

Rapid changes to the evidence that informs patient care mean that members of the medical profession must engage in learning activities designed to enhance their knowledge base, skills, competencies and performance. In order to maintain the privilege of self-regulation, members of the medical profession have an obligation to participate in CPD to demonstrate (to the public) the competencies they profess to have.

Defining the need for time-limited certification and the requirements for recertification

The implementation of a system of assessment of competence traditionally ends when physicians enter practice. The adage that "once in, good for life" is no longer sustainable. Although regulatory systems can utilize either a formative strategy or a summative one, there is a need to define a process – anchored around competencies and performance – for promoting excellence.

Management of lifelong learning systems or activities (e.g. national or regional)

The sustainability of individual, group and team learning will require the support of learning systems that facilitate the skills of lifelong learning, systems for managing knowledge relevant to individual practice, and data that enable the identification of gaps in competence and performance. This system will require the development of formal learning activities, practice-based learning and assessment.

Defining the sanctions for, or implications of, non-participation in CME

Although participation in CME is currently compulsory in some countries, the sanctions or implications for non-participants remain to be defined. When physicians do not engage in learning systems intended to enhance their CPD, it is necessary to define a series of factors worthy of consideration before any withdrawal of privileges or licensure can take place. These steps might include consideration of contextual factors, exploration of any barriers that might have restricted engagement with the learning system, and explicit respect for due process.

Developing incentive structures for effective participation in CME/CPD activities (e.g. credit systems, pay-for-performance options)

Systems for the incentivization of engagement in CME/CPD activities vary throughout the world, and range from hospital privileges and licensure to remuneration. Incentives can involve internal (professionalism) or external (pay-for-performance) motivators or threats (reductions in reimbursement). Incentivization strategies require careful consideration in order to avoid unintended consequences.

Developing classifications or taxonomies for CPD activities across national systems

Because physicians can move freely from system to system to engage in learning activities, it is necessary to have a common classification of activities that promotes understanding and the translation of credits. As similar terms are used (e.g. self-assessment) in different contexts to describe different activities, the development of a common taxonomy will be valuable in promoting the inclusion of CPD activities across national systems.

Defining the principles, values and metrics of CPD accreditation systems: focusing on CPD providers, activities/programmes or both

Accreditation systems, irrespective of whether the CPD is provided by an organization or is part of an individual programme, are developed to address specific contextual and cultural factors or educational priorities. The ability of various CPD systems to recognize each other and collaborate on their future development, however, can be facilitated by having a consensus with regard to a set of principles, values and metrics that any CPD system should reflect. This process helps to define the basis for substantive equivalency between different CPD accreditation systems.

Determining the degree to which physicians can choose to select learning activities that meet their practice-specific learning needs

Learning in practice is contextual and should be driven by the specific needs of physicians. As different physicians learn to address needs or problems in different ways, systems of CPD should include a wide variety of learning strategies and encourage learners to choose or integrate different learning strategies (i.e. varying in type and sequence) to enable them to address specific needs.

Ex ante accreditation for providers

Physicians are expected to engage in learning opportunities that are reasonably free of commercial influence and that are learner-centred. Within a national CPD system, these learning opportunities should be accredited; the designation is seen as a marker of approval or quality, confirming that certain standards or criteria are being met. *Ex ante* accreditation allows providers to become recognized as accredited providers capable of fully accrediting CPD events both locally and nationally.

Defining industry involvement and sponsorship of CPD activities or events

The educational activities that are included within a national CPD system should be developed to ensure that the content is of the highest academic quality and integrity, that it is balanced and that it is free from commercial influence. The acceptance of industry financial support for accredited CPD

activities or events should be guided by a set of ethical standards or guidelines that explicitly describe how such funding will be received and acknowledged.

Are there models or frameworks for CPD that could be used as a platform for developing new, or modifying existing, models of lifelong learning in Europe?

Heterogeneity exists in models of lifelong learning globally. These differences exist partly because of broad diversity in the following areas: the structure of health care systems; medical education models; accreditation systems; social and economic constructs; and geography. Despite these variations, there are some common features, as listed below *(31)*.

- Many employ credit systems (e.g. hours of educational activities equate to credits).
- Activities are categorized as follows: "live" or external activities (e.g. courses, seminars); internal activities (e.g. practice-based activities, case conferences); and enduring materials (e.g. print, CDs).
- In systems in which mandatory recertification or revalidation exists, demonstration of a continuous commitment to learning is compulsory.

There are three models that could be considered as a platform for modifying the existing models or for developing a new model of lifelong learning relevant to European Member States and the EU in particular.

Outcome-based model

An outcome-based model *(32)* is concerned primarily with physician performance, and ultimately focuses on improved patient outcomes. Assessments of performance can focus on variables in the process of care or on practice outcomes. Assessments can be completed individually or collectively but are frequently limited by poor availability of data, tools or support strategies. Data repositories at an institutional, regional, provincial or national level may provide specialists with access to their performance data relating either to their peers or to established standards of care.

The evidence regarding the effectiveness of assessment techniques (such as audit and feedback, academic detailing, simulation, self-assessment programmes, multi-source feedback, and use of the electronic health record) have been shown to improve professional practice and, in some cases, the overall quality of care. The effects on these techniques on patient outcomes, however, remain relatively unknown. The literature on physician self-assessment demonstrates that a physician's ability to self-assess any component of his/her professional practice accurately is limited unless there is a rigorous process in

place and he/she is guided by performance data *(33,34)*. High-performing physicians underestimate their abilities, and the worst accuracy in terms of self-assessment is among the physicians who were the least skilled and the most confident *(27)*. For an examination of the audit and feedback approach as a specific mechanism for ensuring good physician practice, see Policy Summary 3.

Physician assessment must be embedded within – and supported by – the practice context and the health system within which specialists practice. Assessment must be viewed as a formative process designed for the purpose of identifying areas of practice where further learning should be focused. Therefore assessment must occur in a safe environment that is divorced from threats of litigation or fear of failure. Assessment must be relevant to each dimension of professional practice (clinical, educational, administrative and research), across all areas of content (knowledge, skills, attitudes), and to each role or competency as outlined under the CanMEDS model profiled in Fig. 1. Finally, assessment strategies should be promoted at both an individual (e.g. personal practice review) and a collective (collective practice review) level or perspective.

Competency-based model

The accreditation standards for CPD organizations or programmes are based in large part on a set of educational criteria that begin with an assessment of some type of need. For the majority of programmes these needs are defined by planning committees that reflect the intended target audience. The needs assessment informs the development of learning objectives, the selection of educational methods and the success in addressing the needs of physicians. The assumption is that participation will lead to learning that will be translated into practice. The impact of formal CPD based on this programme-planning mode has been studied extensively. Several recent systematic reviews examining the impact or effectiveness of group learning upon defined outcomes have identified that it has a moderately positive impact on levels of knowledge but has only a small to negligible impact on clinical behaviours and patient outcomes *(35,36)*. Given the limitations of the current CPD systems (focusing on satisfaction outcomes and lacking a needs-based approach, etc.), there are advantages to re-establishing a CPD system around the competencies that enhance performance, improve quality of care and increase patient safety.

Competency-based CPD promotes the importance of learning designed to achieve quantifiable improvements in practice. When residents enter practice with the required learning competencies they are in position to develop a practice-specific CPD plan that addresses their needs, continuously improve their performance and measure the impact of their learning on their practice and the health system within which they work *(37)*. Competence promotes engagement in learning that is based, in part, on authentic assessments of

current knowledge, skills and abilities. Competency-based CPD would not limit learning to a lecture hall or small group workshop. Learning that enhances competence could occur in the doctor's lounge, through exchange of "stories" and tacit knowledge, in simulation centres, and while practicing under the supervision of a mentor or coach. Learning opportunities should be as tightly connected with practice as possible, e.g. enabling individuals to rapidly apply and evaluate what was learned through courses or workshops in their practice context.

Equally, the competency-based CPD model is not restricted to assessments of knowledge, skills or performance in clinical practice: assessments are also required across multiple competency areas such as communication skills, collaboration and aspects of professionalism. Rather than simply documenting participation in learning activities "for credit", a competency-approach to CPD would require physicians to develop learning activities in order to meet defined and measureable outcomes.

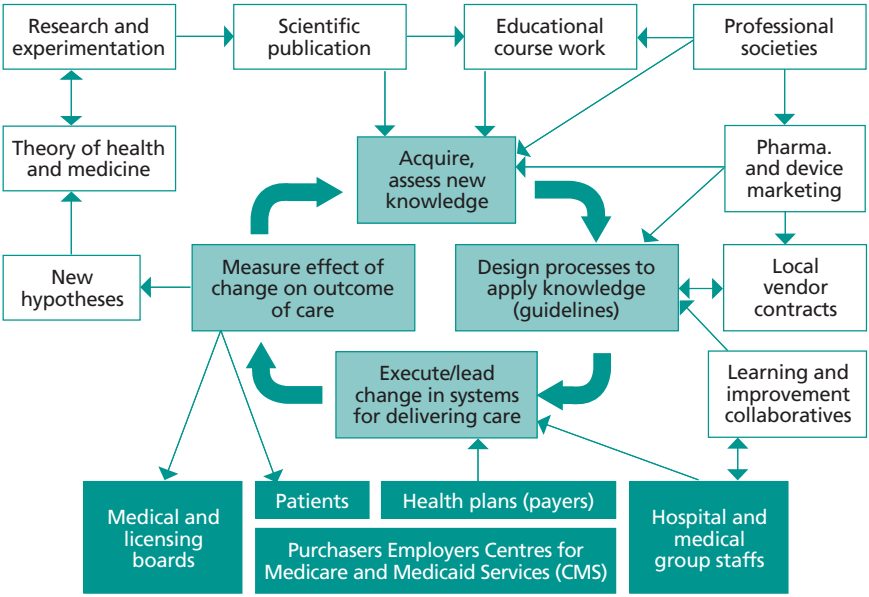
Competency-based CPD changes the approach to needs identification based on perception and opinion to needs derived from performance metrics, health outcomes, and adverse events. The planning process for a competency-based learning event will start with the "ends in mind" and work backwards, rather than starting with what physicians want and hoping that what is learned is translated forward into practice *(38)*. Competency-based CPD integrates the development of learning activities across a broad range of venues from conferences, to rounds, to assessments in a real, simulated or virtual practice. In order to address the needs of different physicians at different stages in the process of change, every learning activity must have several layers of complexity. Finally, competency-based CPD promotes the measurement of outcomes beyond the satisfaction of learners; this is necessary to ensure that the acquired knowledge, skills or competencies are translated to, and embedded within, practice. CPD organizations are important contributors to the development of a framework of competencies that extend beyond postgraduate education and facilitate the ability of individual physicians to match their learning goals.

A competency-based approach in postgraduate medical education has the potential to reduce the time required to acquire the knowledge, skills and abilities, allowing earlier entry into independent practice. One such example is the implementation of a system of competency-based postgraduate education in the Orthopedic Surgery Program at the University of Toronto, Canada, which anticipates a shortening of the training duration from 5 years to 3 years *(39)*. Although competency-based medical education does not necessarily lead to shortening of training, but rather disconnects competence attainment from a set time frame, this challenging project anticipates that some individuals will reach measured levels of competence sooner than others.

Systems-based model

A systems-based model that explores the interrelationship between knowledge generation, knowledge translation, practice-based learning and professionalism has been proposed by the Association of American Medical Colleges and the American Association of Colleges of Nursing *(40)*. Components of the original model are summarized in Fig. 2.

Fig. 2. Model of system-based practice, learning and improvement



The model highlights the creation of new knowledge (formulated by new hypotheses generated by needs and measurements of care) that is then disseminated or translated by authors (shown in Fig. 2 as white boxes). Research findings and published guidelines are "taken up" by professional societies, educational institutions and medical staff (including physicians, nurses, pharmacists, etc.) via "how-to" courses that help physicians and practice managers redesign systems to incorporate new knowledge, products and methods into actual practice changes *(40)*. The role envisaged for pharmaceutical/device companies and marketing in the acquisition and assessment of new knowledge or its application to practice is highly controversial and raises significant concerns relating to conflicts of interest, bias and the commercialization of education and health care.

According to this model, the components included within the black boxes shown in Fig. 2 (medical and licensing boards, patients, etc.) have little influence over CPD. Instead, they represent objectives for physician accountability. However, the contributions of patients and the support provided by medical and licensing bodies, hospitals and medical staff can provide important contributions to physician learning.

The grey boxes in Fig. 2 highlight physicians' tasks in practice-based learning. The first task involves acquiring and assessing new knowledge (e.g. point-of-care learning) and the second task involves designing practice processes in order to apply new knowledge. Although physicians often know the right thing to do, they often fail to reliably perform what they intended to do. The importance of creating a culture of "learning from experiences" that promotes experimentation is highlighted within this model.

The model also outlines the relationships between medical societies, learning collaboratives, pharmaceutical and device manufacturers and local vendors in the provision of education and information so that physicians can redesign their practice. However, for the aforementioned reasons, the separation of education from commercial influence is a vital part of any learning system.

We learn from what we measure, and, ultimately, measurement is essential for improvement. The creation of new knowledge through the generation of new hypotheses is based on observed outcomes. Importantly, measurement is often seen as an essential component in public accountability.

What policy options, conditions and incentives are required to update the knowledge and skills of physicians?

Compulsory engagement in CPD/lifelong learning systems or programmes

The rapidly increasing supply of health care data and the growing concerns relating to patient safety, quality of care and adverse-event rates mean that there is an argument for ensuring that all physicians practicing in the EU should engage in continuous learning activities that sustain their competence and performance throughout the life of their practice. The gap between the expectations of patients and the abilities of their physicians are challenging the relationship between the public and the profession. These gaps have prompted the profession to strengthen assertions of professionalism and have driven the development of programmes of continuous learning to enhance accountability for the maintenance of competence in practice.

However, simply measuring engagement in CPD activities is an inadequate metric of learning, change or improvement. Arguments for promoting but not mandating engagement in CPD are often based on the lack of evidence that

participation in mandatory CPD is efficacious and on the fact that lifelong learning is already part of the professionalism of the vast majority of physicians (who are already committed to enhancing competence, performance and health outcomes).

If mandatory participation in continuous learning is deemed to be a value for the profession and the public, the systems that evolve in Europe (and across the EU) will not necessarily look the same for all physicians. Ideally, systems of CPD should:

- support the development of lifelong learning skills and competencies;
- be relevant to the practice profile of each learner;
- address the perceived and unperceived needs of each learner's professional practice (e.g. gaps in knowledge, skills or performance); and
- include continuous assessments of how the individual learner or the health care team is performing (e.g. audit and feedback). As such, advocating participation in compulsory systems of CPD is based on a public expectation, a professional imperative and a regulatory requirement.

Table 1 provides a more complete listing of all the arguments for and against the introduction of compulsory medical education system.

Table 1. Arguments for and against mandatory CPD

Arguments for mandatory CPD	Arguments against mandatory CPDs
Ongoing professional education of physicians is necessary to protect the public.	Professionals should be accountable for their own effective performance, not just participation; mandatory CPD removes this individual responsibility.
Involvement of every practitioner in educational programmes is guaranteed.	All that can be mandated is attendance; there is no guarantee of change in attitudes, knowledge or skills.
Continued practice licensure accountability is guaranteed.	Principles of adult learning are violated; there is a punitive element for those who engage with the process voluntarily.
Mandatory CPD represents a transition into more effective systems of professional accountability.	Physicians may depend on traditional programmes rather taking responsibility for their own learning.
An informed professional awareness is maintained.	Most physicians continue their own self-directed learning; mandatory CPD is only required for those who are uncommitted.

Table 1. Arguments for and against mandatory CPD (continued)

Arguments for mandatory CPD	Arguments against mandatory CPDs
Physicians will engage in education to address needs that they might otherwise ignore.	Performance of the incompetent may not improve.
Well-designed programmes can influence effective practice.	Evidence for improved practice is lacking.
Professional and geographical isolation may be minimized.	Programmes delivered may not be consistent and may lack relevance to practitioner needs.
Performance of the "reluctant" practitioner is improved.	Proliferation of programmes of questionable quality may occur.
	Mandatory CPD is an expensive policy.

Source: summarized from Donen (41).

Although participation in mandatory systems of CPD ensures that each licensed physician engages in, and achieves, minimum expectations, the key argument against mandating CPD is the lack of evidence that engaging in CPD enhances or improves professional practice. Do mandatory systems improve the knowledge, skills or competencies of physicians? Do mandatory systems of CPD have an impact on performance or health outcomes?

The traditional model of CME was based on the assumption that if experts gave lectures telling physicians how they should practice, then this knowledge would be automatically implemented into practice and patient care would improve. After several decades of research based on this traditional model of CME there is persistent evidence of a quality-of-care gap, with 30–40% of patients not receiving treatments of proven effectiveness, and 20–25% of patients receiving care that is not needed or is potentially harmful *(42)*. In addition, adherence to the recommended health care indicators provided to adults remains low irrespective of the field of health involved: for preventive care, the level of adherence was found to be 54.9% *(43)*, for acute care it was 53.5% *(43)* and for chronic care it was 56.1% *(43)*.

There is now growing and consistent evidence from systematic reviews that participation in group learning is effective in improving knowledge, but has a lower impact on practice behaviours or clinical outcomes *(35,36)*. In 2009, the updated Cochrane systematic review of continuing education meetings and workshops on professional practice and health care outcomes demonstrated that the median adjusted absolute improvement for compliance with desired practice

was 6%, and that the value for patient outcomes was 3% *(44)*. However, the median improvements in desired practice increased to 13.6% when the group event included didactic and interactive educational methods, or where the complexity of the behaviour change was moderate (10.5%) or low (4.7%). These findings demonstrate that group learning can be as effective as audit and feedback or educational outreach visits in terms of changing practice behaviours.

Mandatory systems of CPD are not established to prove or disprove physician competence or continued fitness to practice. There are processes and strategies available to make these determinations. Participation in mandatory systems of CPD that embed effective educational strategies and tools for enhancing knowledge, assessing and enhancing competence and performance, and achieving improved patient outcomes requires a culture shift towards a system of continuous quality improvement in learning that is dynamic and outcome-focused. Continuous lifelong learning in practice serves as a foundation for achieving the expectations of the profession, the public and the health system.

Development of a common CPD accreditation system for providers and/or programmes

Within medical undergraduate and postgraduate educational systems, accreditation systems have been developed and implemented on the basis of an established set of principles, standards and metrics. Within CPD, several national CPD systems have developed accreditation systems focused on the providers of CPD (i.e. a provider-centric model), the individual programmes or activities (i.e. a programme-centric model), or both. Accreditation systems for CPD activities are typically based on a set of standards that articulate the educational and ethical requirements that must be met for an activity to be included within a system of CPD or to qualify for credits.

Within Europe, and the EU specifically, there is an opportunity to promote mutual recognition of national CPD accreditation systems across Member States. Approaches to mutual recognition can be developed such that all CPD accreditation systems are required to be the same, or substantively equivalent. Substantive equivalency is based on the ability of each system to reflect a common set of principles, values and metrics. For example, the principles, values and metrics established by the "Rome Group" describe the enduring values that a CPD system should reflect and then articulates the responsibilities of the accrediting bodies, the learners and the provider or organizer of CPD activities (Annex 1). Regardless of the scope of the learning activities included within national CPD frameworks, or the number of credits expected to be achieved, the process of substantive equivalency is based on the ability of CPD systems to demonstrate how these principles, values and metrics are implemented and expressed within each system. Barriers to the adoption, or implementation, of

learning activities completed externally result from an uncertainty as to whether these activities were designed to promote deep learning *(31)*.

Engagement in group learning activities is almost universal among physicians, and the education research literature has established the value of group learning that meets defined criteria. Consequently, CPD accreditation systems contribute to the quality of education within mandatory systems of physician learning. Physicians use multiple learning strategies to meet the needs in their professional practice. CPD organizations play an important role in developing learning activities that are educationally and ethically rigorous. The creation of CPD accreditation standards and systems establishes the requirements and expectations of providers or programmes in ensuring the quality of the educational process and contributes to the confidence of physicians who elect to participate in these activities.

A common accreditation system is focused on enhancing the quality and rigour of the providers or programmes that physicians depend on or use to develop and implement a practice-specific, needs-based learning plan, and useful examples can be drawn from other jurisdictions, as outlined below.

North America

In the United States, the CPD accreditation system is focused on provider organizations. The Accreditation Council for Continuing Medical Education is the body responsible for establishing and monitoring adherence to the standards of accreditation. The accreditation standards assess the following areas: the purpose and mission of the CPD organization; various elements relating to the educational planning process; the strategies for evaluating the effectiveness of individual CPD activities; and the overall CPD programme and the organizational framework that ensure that the required resources, policies and procedures are in place to meet the accreditation requirements. Continued accreditation requires compliance in each of these areas. Accreditation with commendation is based on the ability to demonstrate how the organization has developed processes for improving professional practice, how it has removed barriers to learning and change, and how it has collaborated within an institutional and system framework to achieve quality improvement. The accreditation standards reflect the importance of basing learning activities on needs assessment, the promotion of learning, change and performance improvement, and independence from commercial influence.

In Canada, the CPD accreditation system of the Royal College of Physicians and Surgeons of Canada is equally focused on CPD providers and is based on adherence to a similar set of national accreditation standards. In 2008, the Accreditation Council for Continuing Medical Education and the Royal College of Physicians and Surgeons of Canada participated in a process to determine

the substantive equivalency of these two systems. The review process – based on the completion of a survey, the provision of required documentation and an on-site visit conducted to determine how decisions relating to adherence were based on data – concluded that the two systems were substantively equivalent. In addition to developing accredited group learning activities, accredited CPD organizations in Canada are able to independently develop simulations and self-assessment programmes and are expected to facilitate the self-learning strategies of individual physicians. Organizations that are accredited for the provision of CPD (on the basis of their demonstrated adherence to accreditation standards) are authorized by the Royal College of Physicians and Surgeons of Canada to review and approve the activities of other organizations to ensure that they meet the educational and ethical standards for the Maintenance of Certification programme. In addition, rounds, journal clubs and small group learning activities are accredited if it is demonstrated that they adhere to accreditation standards established for these regularly scheduled sessions.

New Zealand and Australia

In New Zealand, participation in mandatory CPD systems has been required by the Government. In Australia, the various royal colleges have developed CPD systems, but participation can be mandatory or voluntary. Regardless of the participation requirements for engagement in lifelong learning, there is no established accreditation system of providers or programmes. Without a CPD accreditation system, there is no process to ensure that the educational processes developed meet the needs of the profession. It is also not possible to ensure that the academic integrity and balance of the content is free from commercial influence, or whether there was an appropriate assessment of learning, change or improvement.

Defining the role and expectations of the health care system in supporting continuous quality improvement in learning

Physicians encounter a range of potential barriers that can prevent them from translating the results of their CPD into the optimization of care. These obstacles can occur at a variety of levels, including the following: structural difficulties (e.g. financial disincentives); organizational barriers (e.g. an inappropriate skill mix or a lack of facilities or equipment); peer-group difficulties (e.g. the local standards of care are not in line with desired practice); individual barriers (e.g. concerning knowledge, attitudes or skills); "information overload" within complex consultations, leading to acts of omission; or problems involving patients' expectations (e.g. pharmaceutical advertising directed at consumers). To address these barriers and optimize the benefits of lifelong learning for patient care and outcomes, physicians, providers of CPD and the health care system need to take a "shared responsibility" approach

to lifelong learning and CPD. Similarly, health care systems can support the lifelong learning activities of physicians and CPD providers by creating and supporting an environment that is conducive to learning. For example, health systems should ensure access to the evidence base that informs knowledge-management strategies and performance data. Health systems should also engage in the provision, and promotion, of targeted strategies for enhancing knowledge translation.

The educational and health systems must provide an infrastructure that supports a range of activities that physicians and health teams can use to assess their performance in practice. For example, physicians and other health care stakeholders require basic access to knowledge sources and enhanced push activities in order to disseminate and facilitate knowledge transfer. The latter can include electronic libraries and databases (e.g. MEDLINE/PubMED), physician performance data (e.g. electronic health records) and point-of-care learning materials (e.g. evidence-based summaries). In general, physicians should focus upon synthesized knowledge (as opposed to evidence from single studies) to inform their practice.

Unfortunately, many physicians do not have easy access to such knowledge within their working environments. In cases where physicians do have access, evidence suggests that search errors and an inability to generate well-formulated questions are major barriers to accessing relevant, high-quality information efficiently. Health care systems could facilitate equitable knowledge access among physicians by using centralized coordinated purchasing and the provision of key knowledge resources (e.g. by establishing an electronic library). Issues such as internet provision and skills acquisition within workplaces might also need to be addressed. Within the EU, language barriers could also occur, particularly when learning materials are disseminated across borders.

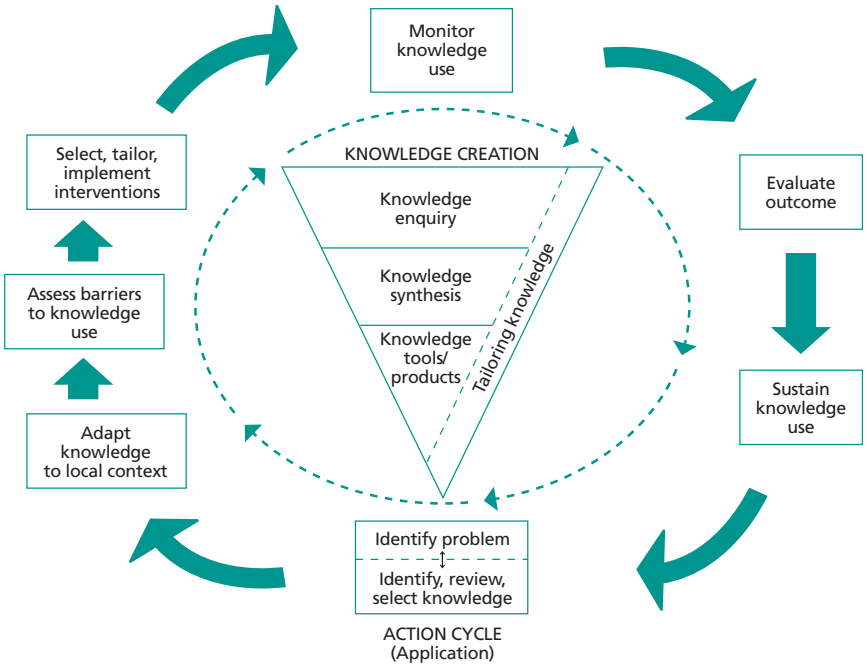
In addition, physicians may also lack the time and skills needed to access and appraise research knowledge. Therefore, the creation of various push strategies – outlined below – to review a range of evidence may facilitate the use of knowledge by physicians.

- Knowledge portals can be used to organize, appraise and summarize knowledge resources to facilitate the identification of relevant high-quality information.
- Asynchronous knowledge services can be used to screen and appraise research information and highlight high-quality, high-relevance research evidence for clinicians *(16,45)*.
- "Just-in-time" knowledge services can provide real-time (synchronous) knowledge support to address specific practice-based questions from physicians *(46)*.

- Rapid-response services can provide asynchronous knowledge support for physicians, for example providing a scoping review of the research base within 1–2 weeks of a request.

Health care systems should also share responsibility for supporting, promoting and facilitating knowledge translation. Health systems should strive to ensure that new knowledge is used optimally to improve patient care. The "knowledge-to-action loop" (Fig. 3) highlights central processes relating to knowledge creation, distillation and use *(47)*. In this model, the central "knowledge-creation funnel" represents knowledge generation, synthesis and the development of knowledge tools. The action parts of the cycle are based on planned action theories that focus on deliberate engineering of change in health care systems and groups. The processes required in order to implement knowledge in health care settings are included in the loop: problem identification, assessment of the determinants of knowledge transfer (KT); selection, tailoring, implementation and evaluation of KT interventions; and the determination of strategies for ensuring sustained knowledge use.

Fig. 3. Knowledge-to-action loop



The Cochrane Effective Practice and Organisation of Care Group has completed three overviews of knowledge-translation activities *(48,49,50)*. To date, summaries of over 200 systematic reviews of professional behaviour-change interventions have been made available in the Rx for Change Database (which summarizes current research evidence about the effects of strategies for improving drug-prescribing practice and drug use) *(49)*. Annex 2, which is based on the highest-quality reviews in the Rx for Change Database *(49)* summarizes the effects of key interventions. In addition, we consider the likely mechanisms of interventions, the potential barriers that the interventions might address, and some practical and logistical issues.

Overall, the results demonstrate that most interventions are effective under certain circumstances, being associated with modest – but important – effects. Whilst there is a substantial evidence base supporting the effectiveness of some interventions (e.g. audit and feedback, educational outreach), there is much less evidence available about other interventions (e.g. the role of opinion leaders); accordingly, inferences are limited. The resources required to deliver these interventions range from relatively inexpensive ones (e.g. educational materials) to relatively expensive ones (e.g. educational outreach). However, given the costs of health care, even relatively small effects from relatively expensive interventions may still be cost-effective *(51)*. Finally, the practical steps required to deliver interventions are often poorly identified in the available studies. Some of these interventions could be delivered through CPD mechanisms (e.g. educational materials and meetings), whereas others are more likely to be delivered by the health care system (e.g. audit and feedback and reminders). This highlights the potential importance of aligning CPD and lifelong-learning activities with health-system priorities.

Implementation considerations

In considering what infrastructure considerations would need to be in place for the pursuit of any policy options, this discussion specifically addresses considerations for promoting cross-national learning/training and new forms of knowledge transmission.

The diversity of CPD systems within Europe poses a challenge for health care professionals and policy-makers alike, particularly with respect to cross-border movement and practice requirements. In the EU specifically, this diversity is increasingly becoming a barrier for those investing in the pursuit of harmonization of CPD across Member States. In order to build equivalent national CPD systems, several infrastructural issues need to be considered if the policy options outlined within this Policy Brief are to be implemented successfully.

Mutual agreement and recognition of CPD

Most importantly, there must be mutual agreement and recognition by all physicians, stakeholders, and medical societies in any Member State that engagement in formal CPD and, more broadly, lifelong learning, is an accepted and necessary professional and ethical obligation. It is an essential foundation for successful harmonization across Member States that there is a collaborative agreement to that effect.

Uniformity of accreditation standards

Uniformity of accreditation standards between nations must be established to ensure that physicians can train across borders with confidence. Uniformity should exist for the principles and outcomes of accreditation of CME/CPD providers and organizers. This uniformity would ensure that physicians seeking educational activities not provided within their own countries would be similarly equivalent with regard to educational components, outcomes and quality.

A group of leaders of CPD accreditation systems in several Member States within the EU, the United States and Canada (The Rome Group) have begun to develop a consensus statement of basic values and responsibilities underlying the substantial equivalency of CPD systems. This statement argues that CME/CPD accreditation systems should (1) enhance physician performance and thereby improve the health of people and (2) be based on information concerning the educational needs of physicians, with the ultimate aim of helping them to improve health.

The values and responsibilities provide a clear outline of expectations that could be considered more broadly within the EU.

1. Values

   CME/CPD systems should be based on enduring values that:

   - enhance physician performance and thereby improve the health of people
   - are based on information concerning the educational needs of physicians with the ultimate aim of helping them improve health.

2. Responsibilities in the System (CPD accrediting bodies)

   Accrediting organizations must demonstrate:

   - fairness, validity, innovation, honesty and consistency in accreditation practices;
   - reasonable standards and criteria for CME/CPD providers/organizers;
   - accountability, responsiveness and leadership;

- that the accreditation process includes verification that the required responsibilities of providers/organizers are carried out;
- the promotion of continuous quality improvement of the accreditation process as well as the education systems that it supports; and
- that collaboration and partnership between and among accreditation bodies, and between accreditation bodies and providers/organizers.

In order to claim credit, the learner has certain responsibilities to fulfil, namely:

- participating in CME/CPD that is based on his/her individual educational needs;
- ensuring that his/her needs are relevant to his/her professional practice and development in the context of improving the care and health of patients;
- evaluating the extent to which his/her needs have been met, in the context of a change in knowledge, competence or performance; and
- verifying that mechanisms are in place to keep educational activities free from commercial bias.

In order to grant credit, the provider/organizer of the CME/CPD activities has certain responsibilities to fulfil, as outlined below.

- Any commercial sponsorship or interests of the activity planner, presenters or facilitators must be disclosed to the provider/organizer, the learners and the accrediting bodies.
- Any support, sponsorship or funding by commercial health care organizations must not influence the structure or content of the educational activity and should be made clear to the participants and the accrediting bodies.

The provider/organizer must:

- ensure there are outcome measures for educational effectiveness (expressed in terms of meeting the knowledge, competence or performance objectives of the activity);
- be able to provide confirmation of participation, at a frequency and nature appropriate to regulatory requirements;
- ensure that the learning objectives are specifically defined in terms of knowledge, competence or performance, and are appropriate for the target audience;
- ensure that the teaching methods used are appropriate to the stated learning objectives; and
- be able to show that they have evaluated the quality of any previous educational activities and have made improvements, where necessary.

Delivery mechanisms for CPD

In keeping with the guidelines set forth within the laws of reciprocity, each country should create and adopt its own means of delivering CPD. It is important to highlight the fact that the underlying consideration for harmonization within this Policy Brief is the mutual recognition and equivalency of values and standards. Each country should also develop a method (e.g. a centralized electronic recording mechanism) for tracking activities and learning outcomes. Like CPD delivery, tracking mechanisms would also be expected to be designed specifically to conform with the economic, social, cultural and technological infrastructures of each country.

Industry sponsorship

Although numerous types of financial relationships exist between physicians and those involved with CPD activities, the relationship that has received most attention, and is of most concern, is commercial sponsorship. There is a view that CPD has become too reliant on industry for support in the development of CPD activities. In fact, data from the Accredited Council for Continuing Medical Education have shown that in the United States alone, CPD is a $2 billion dollar per year business, with less than 50% of its revenue being generated by physicians *(52)*.

With health care expenditures decreasing and costs rising, what are the options for ensuring that CPD maintains its educational integrity, whilst balancing increasing costs? Morris et al. (2009) outlined the following options and provided both positive and negative perspectives for each option *(53)*.

The first option is to disallow commercial sponsorship entirely for CPD events. This would successfully remove most, if not all, commercial bias within CPD events. As physicians would be expected to cover the entire cost, they might begin to demand more meaningful education in exchange for their training funds. This, in turn, would encourage CPD providers to offer high-quality programmes at lower costs.

The second option allows commercial sponsorship of CPD without influence over the educational agenda. Two frameworks could be considered: a pooled-funding mechanism, or a menu of topics. The pooled-funding mechanism allows independent CPD grant organizations to receive awards from both sponsors and awards grants) to support educational events. A collection of funds is conducted and then, via a transparent and objective process, funding is awarded on the basis of the educational merit of the CPD programme; however, the donors are not allowed to specify which programmes they would prefer to support. The use of a menu of CPD topics is an approach in which a respected third party is given the task of identifying educational needs and requiring that CPD accreditation covers a topic from this menu.

The final option for consideration examines accreditation of specific CPD activities instead of CPD providers. Although activity-level accreditation is a more resource-intensive approach, because respected professional societies review individual programmes this approach could provide assurance of educational quality when CPD activities are being selected.

Performance assessment

Pressures to improve quality of care, patient safety and cost-effectiveness have served as forces for change in the CPD community. CPD is no longer just about learning: increased attention and expectation are being focused on improvement of physicians' performance (clinical skills, communication skills, etc.) and, ultimately, patient outcomes. Performance or competency assessment is now recognized as an imperative. In terms of performance assessment, systems must ensure that health-outcome measurements are directly linked to CPD. As described previously, physician assessment must be embedded within (and supported by) both practice and the health system within which the specialists practice. Assessment must be viewed as a formative process designed for the purpose of identifying areas of practice where further learning should be focused. Therefore assessment must occur in a safe environment and be divorced from threats of litigation or fear of failure. Assessment must be relevant to each dimension (clinical, educational, administrative and research) of professional practice and apply across all types of content (knowledge, skills, attitudes) and the aforementioned CanMEDS roles or competencies.

Assessment strategies should be promoted at both individual level (e.g. through a personal practice review) and collective level (through collective practice review).

Summary

Within Europe, there is currently no commonly accepted approach to lifelong learning, but there is broad agreement that patients are best served when those who care for them maintain competence by engaging in continuous learning and assessment strategies.

To foster the engagement of all physicians in continuous learning, and to increase accountability, compulsory engagement in CPD systems or programmes should be considered. It will be important to ensure (and enhance) the quality and rigour of the providers or programmes that physicians depend upon when developing and implementing their own practice-specific, needs-based learning plans. The development of a common CPD accreditation system for providers and programmes is deemed essential, as is the concept of "shared responsibility" by all parts of the health care system in the promotion and support of an environment in which learning can occur.

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Annexes

Annex 1. Furthering globalization, reciprocity and the substantial equivalency of systems of accreditation and credit in CME and CPD

Background and rationale

It is agreed that reasonable uniformity between countries in terms of the principles and outcomes in the accreditation of CME/CPD and providers and organizers and credit systems would be valuable. Physicians could obtain credits for different local, national and international organizations that require CME/CPD for the purpose of maintaining status. In addition, physicians attending activities, and organizations that value accredited CME/CPD could be assured of education that is of good and predictable quality. Among the many important elements of CME and professional development (CME/CPD) systems are the following: (i) the involvement of physician-learners in learning projects in support of their personal CPD; (ii) providers and organizers of educational activities (or events) that are an educational resource to physicians; and (iii) accrediting organizations that certify that the providers and organizers of educational activities meet certain accreditation standards so that "credit" can be awarded for participation in the activity.

Therefore representatives from organizations within the CME/CPD accreditation and credit systems of Bulgaria, Canada, France, Germany, Italy, Spain, the United Kingdom, the United States and the EU have arrived at a consensus that the following are shared and enduring values of a CME/CPD accreditation and credit system, as well as being essential and basic/core responsibilities of providers/organizers within such systems. It is felt that the integration of these elements into CME/CPD systems will facilitate the free movement of learners between the various nations' CME/CPD systems. The participants in this consensus-building process believe that the implementation of CME/CPD systems built using these values and responsibilities will lead to mutual recognition and reciprocity while at the same time maintaining each other's cultural and historical uniqueness.

Participating organizations

International

European Accreditation Council for Continuing Medical Education

National

Accreditation Council for Continuing Medical Education (USA)
American Medical Association (USA)
Bulgarian Union of Scientific Medical Societies (Bulgaria)

College of Family Physicians of Canada (Canada)
Federation of Royal Colleges of Physicians (United Kingdom)
French National Medical Council (France)
Italian Federation of Scientific Medical Societies (Italy)
National CPD Commission of the Italian Ministry of Health (Italy)
Royal College of Physicians and Surgeons of Canada (Canada)
Spanish Accreditation Council for CPD (Spain)

Regional

Bavarian Chamber of Physicians (Germany)

Annex 2. WHO systematic review search strategy

Ovid MEDLINE(R) 1950 to March Week 2 2010

	Search	Result
1	exp Education, Medical/	108135
2	exp Education, Nursing/	62451
3	exp Education, Pharmacy/	3983
4	Education, Public Health Professional	334
5	Educational Measurement/	21852
6	Clinical Competence/	47956
7	Self-Evaluation Programmes/	848
8	continuing professional development.tw.	582
9	continuing medical education.tw.	3173
10	educational influential?.tw.	3
11	lifelong learning.tw.	509
12	(reflective adj (learn$ or practice)).tw.	530
13	(education$ adj (method? or material? or program$ or intervention$ or meeting? or session? or strateg$ or workshop? or visit?)).tw.	30326
14	Medical Audit/	12270
15	Nursing Audit/	2777
16	Clinical Audit/	227

Ovid MEDLINE(R) 1950 to March Week 2 2010 (continued)

	Search	Result
17	Feedback/ or Feedback, Psychological/	24409
18	(audit adj2 feedback).mp.	271
19	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	272330
20	Meta-Analysis as Topic/	9937
21	meta analy$.tw.	27143
22	metaanaly$.tw.	902
23	meta-analysis/	23488
24	(systematic adj (review$1 or overview$1)).tw.	20282
25	exp "Review Literature as Topic"/	4668
26	20 or 21 or 22 or 23 or 24 or 25	57532
27	cochrane.ab.	12936
28	embase.ab.	10479
29	(psychlit or psyclit).ab.	778
30	(psychinfo or psycinfo).ab.	3200
31	(cinahl or cinhal).ab./	4139
32	science citation index.ab.	1061
33	bids.ab.	276
34	cancerlit.ab.	455
35	27 or 28 or 29 or 30 or 31 or 32 or 33 or 34	19969
36	reference list$.ab.	5068
37	bibliograph$.ab.	8035
38	hand-search$.ab.	2259
39	relevant journals.ab.	399
40	manual search$.ab.	1271

Ovid MEDLINE(R) 1950 to March Week 2 2010 (continued)

	Search	Result
41	36 or 37 or 38 or 39 or 40	15294
42	selection criteria.ab.	12157
43	data extraction.ab.	5600
44	42 or 43	16809
45	"Review"/	1504311
46	44 and 45	11372
47	Comment/	404125
48	Letter/	672491
49	Editorial/	251714
50	Animals/	4510349
51	Humans/	11058165
52	50 not (50 and 51)	3359807
53	47 or 48 or 49 or 52	4311573
54	26 or 35 or 41 or 46	75147
55	54 not 53	69634
56	19 and 55	1728
57	limit 56 to English language	1580

Annex 3. Additional references for consideration

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Annex 4. Summary of the key findings from overview of reviews

Intervention (key reference)	Definition of intervention based upon *(1)*	Barriers addressed	Effectiveness	Resource considerations	Practical considerations
Printed educational materials *(2)*.	Distribution of published or printed recommendations for clinical care, including clinical practice guidelines, audiovisual materials and electronic publications.	Individual professional knowledge (attitudes).	6 Randomized controlled trials (RCTs) Generally effective. Median effect size +4.6% absolute improvement (range).	Relatively inexpensive.	Individual professional knowledge (attitudes).
Educational meetings – didactic *(3)*.	Health care providers who have participated in conferences, lectures, workshops or traineeships.	Individual professional and peer-group knowledge, attitudes and skills.	30 RCTs. Generally effective. Median effect size across 36 comparisons 6% absolute improvement (interquartile range 1.8 –15.9). Larger effects observed with: higher attendance at educational meetings; with mixed interactive and didactic educational meetings; simpler behaviours; and serious outcomes.	Relatively low cost (didactic) to modest expense (mixed/ interactive – usually higher facilitator/ participant ratio than didactic activities).	Commonly used in health care settings.

Educational outreach *(4)*.	Use of a trained person who met with providers in their practice settings to give information with the intent of changing the providers' practice.	Individual professional knowledge and attitudes assessed using a social marketing approach *(5)*.	69 RCTs. Generally effective. *Prescribing behaviours:* median effect size across 17 comparisons 4.8% absolute improvement (interquartile range 3.0–6.5%). *Other behaviours:* median effect across 17 comparisons 6.0% absolute improvement (interquartile range 3.6–16.0%).	Relatively expensive because of employment of academic detailers (although can still be efficient) *(6)*.	Used in some health care systems. Typically aimed at getting a maximum of three messages across in 10–15 min (using approach tailored to individual health care provider); uses additional strategies to reinforce approach *(5)*. Typically focuses on controlling relatively simple behaviours of individual physicians (e.g. choice of drugs for prescription).
Local opinion leaders *(7)*.	Use of providers nominated by their colleagues as being "educationally influential". The investigators must have explicitly stated that their colleagues had identified the opinion leaders.	Individual professional and peer-group knowledge, attitudes (skills).	12 RCTs. Generally effective. Median effect 10% absolute improvement (absolute range –6% to +25%).	Moderately expensive because of the need to survey a target population for each condition.	Rarely used in health care systems. Majority of studies have used the Hiss instrument to identify opinion leaders (who are up to date, good communicators, humanistic). Intervention appears to be condition-specific *(8)*. Coverage across social networks is often uncertain. Temporal stability is uncertain *(8)*

Intervention (key reference)	Definition of intervention based upon *(1)*	Barriers addressed	Effectiveness	Resource considerations	Practical considerations
Audit and feedback *(9)*.	Any summary of clinical performance of health care over a specified period of time.	Individual professional (and peer-group) awareness of current performance.	118 RCTs. Generally effective. Median effect across 88 high-quality comparisons +5% (interquartile range +3% to 11%). Larger effects seen if baseline compliance is low.	Resources required largely relate to costs of data abstraction. Can be relatively cheap if data can be abstracted using routine administrative systems.	Feasibility may be dependent upon availability of high-quality administrative data.
Reminders *(10)*.	Patient- or encounter-specific information (provided on a computer screen) that is designed or intended to prompt a health professional to recall information.	Individual professional cognitive/ memory barriers.	28 RCTs. Generally effective. Median effect across 32 comparisons +4.2% (interquartile range 0.8–18.8%).	Resources vary across delivery mechanism. Increasing use of computerized reminders (where inclusion of reminders is relatively inexpensive).	Insufficient knowledge about how to prioritize and optimize reminders.
Multifaceted interventions *(11)*.	An intervention including two or more components.	Targeting of multiple barriers affecting the included intervention components.	Grimshaw and colleagues failed to demonstrate a dose-response analysis (i.e. the apparent effects of interventions did not increase with the number of components).	Probably more costly than single interventions.	Need to carefully consider how to combine interventions to ensure additive or synergistic effects (e.g. interventions that include components that target the same barriers may not be additive/synergistic).

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2. How can the impact of health technology assessments be enhanced?
   Corinna Sorenson, Michael Drummond, Finn Børlum Kristensen, Reinhard Busse
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   Angela Coulter, Suzanne Parsons, Janet Askham
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This publication is part of the joint policy brief series of the Health Evidence Network and the European Observatory on Health Systems and Policies. Aimed primarily at policy-makers who want actionable messages, the series addresses questions relating to: whether and why something is an issue, what is known about the likely consequences of adopting particular strategies for addressing the issue and how, taking due account of considerations relating to policy implementation, these strategies can be combined into viable policy options.

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