CME Article

Clinical practice guidelines

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ABSTRACT

This paper introduces the concepts of evidence-based clinical practice guidelines. It describes the key elements of guideline development, using examples from the Scottish Intercollegiate Guidelines Network (SIGN), and then goes on to discuss how practitioners in Singapore and other countries can find and use guidelines from other areas of the world. It concludes with a short section on the future direction of guideline development.

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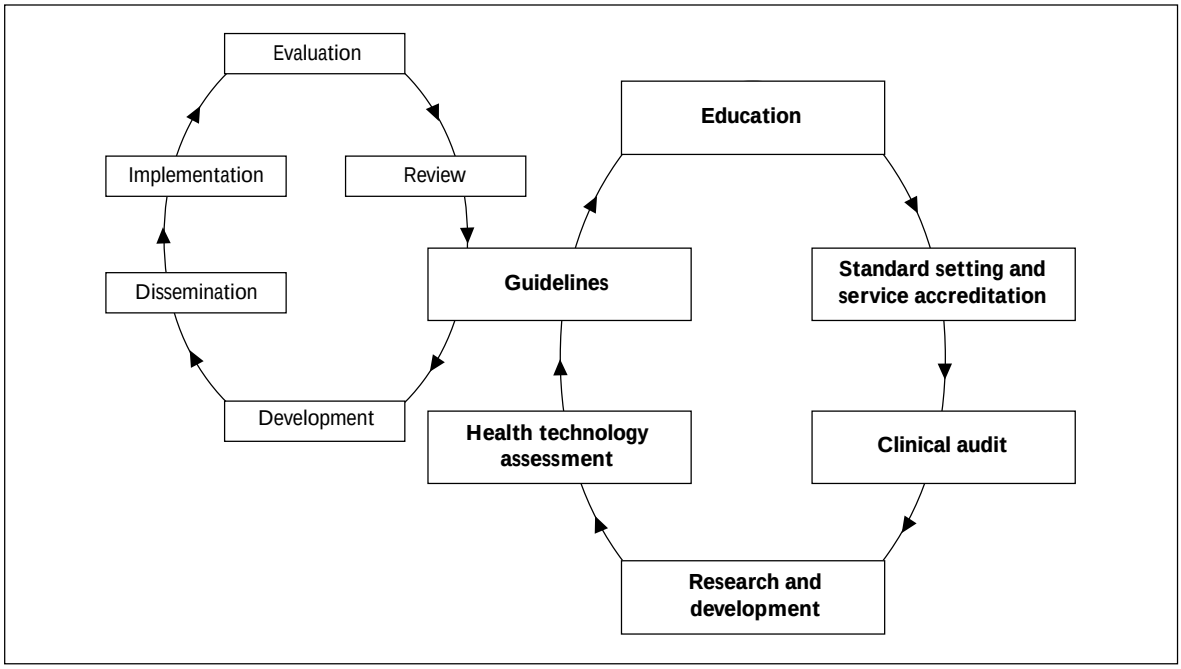
INTRODUCTION

Clinical practice guidelines have been defined as "systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances[1]." Guidelines are designed to help practitioners assimilate, evaluate and implement the ever-increasing amount of evidence and opinion on best current practice and assist them in making decisions about appropriate and effective care for their patients. Clinical guidelines are neither protocols, with precise instructions as to what must be done, nor textbooks, which address a topic in minute detail. Their role is most clear when two factors are present: evidence of variation in practice that affects patient outcomes and a strong research base providing evidence of effective practice.

Clinical practice guidelines should not, however, be seen in isolation from other clinical effectiveness activities. Guideline development, implementation, and review should really be seen as a cycle of interdependent activities. These in turn are part of a range of complementary activities to translate research into practice, set and monitor standards, and promote clinical excellence in any health service, as illustrated in Fig. 1. Guidelines contribute to, but are not in themselves sufficient to ensure, the highest standards of patient care and improved outcomes.

Fig. 1 Clinical effectiveness cycle.



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LEGAL ISSUES

A frequently-asked question about clinical guidelines is their legal status. In particular, there have been concerns that healthcare professionals could be sued for following recommendations when an adverse outcome has occurred. Conversely, could healthcare professionals be sued for not following current guidelines? Hurwitz[2] summarised the role of guidelines in court thus: "Guidelines could be introduced to a court by an expert witness as evidence of accepted and customary standards of care, but they cannot be introduced as a substitute for expert testimony. Courts are unlikely to adopt standards of care advocated in clinical guidelines as legal "gold standards" because the mere fact that a guideline exists does not of itself establish that compliance with it is reasonable in the circumstances, or that non-compliance is negligent. Also, clinical guidelines cannot offer thought-proof mechanisms for improving medical care. However well linked to evidence, clinical guidelines need to be interpreted sensibly and applied with discretion'.

HOW GUIDELINES ARE DEVELOPED

There are several different types of guidelines. The major groups are those based on expert opinion, those based on formal consensus, those based on evidence and those based on a combination of evidence and consensus. They can be uni-disciplinary or multidisciplinary and address very focused questions or whole areas of care. Each has its advantages and disadvantages.

Expert opinion – early guidelines relied very much on the views of "opinion leaders" in clinical specialties, and recommendations for care within a given specialty were made on the basis of these views. This approach has the advantage of being very inexpensive, but the potential for bias is enormous, as the views of the "opinion leaders" may, or may not, be based on high quality evidence. There may also be hidden conflicts of interest.

Specialist societies, an obvious source of expert opinion, have become increasingly involved in the production of clinical practice guidelines. However, in many cases, the methodology used to derive these guidelines is unclear. A paper in the Lancet in 2000 reported a survey of 431 practice guidelines produced by specialty societies over a ten-year period. These were assessed in terms of whether they reported: the type of professionals and stakeholders involved in the development process; the strategy to identify primary evidence and an explicit grading of recommendations according to the quality of supporting evidence. The survey found that the three criteria were only met in 22 (5%) of the guidelines and called for explicit methodological criteria to be devised to promote common standards of reporting[3].

Formal consensus – formal consensus methods include Delphi, consensus conferences and nominal group technique. Their main use is to define levels of agreement on areas where there is insufficient evidence to derive recommendations. It has been suggested, however, that the output from consensus methods may be affected by the way questions are posed, the selection of the participants, the way in which interaction is structured, and the methods used for synthesising individual judgements[4].

Evidence-based guidelines rely on systematic analysis of evidence. This requires the skills to identify the evidence in the first place, a task which has been significantly enhanced by access to the Internet and electronic databases, skills to identify high quality evidence from poorer quality evidence, and a means by which evidence can be converted into recommendations. Guidelines based on evidence alone are most useful in areas where there is a large body of high quality evidence, such as treatments for cancer, but tend to be less useful in areas where evidence is sparse, such as a large part of mental health.

In practice, the majority of guidelines have elements of both evidence and consensus, not necessarily based on formal consensus methods. Our own experience in SIGN is that this mix of approaches generates high quality, useful guidelines for practising clinicians.

Whatever the source of guidelines the methodology used to derive the recommendations should be open and transparent. This should allow the reader to assess the validity of the recommendations made and the usefulness of the guideline for their particular circumstances.

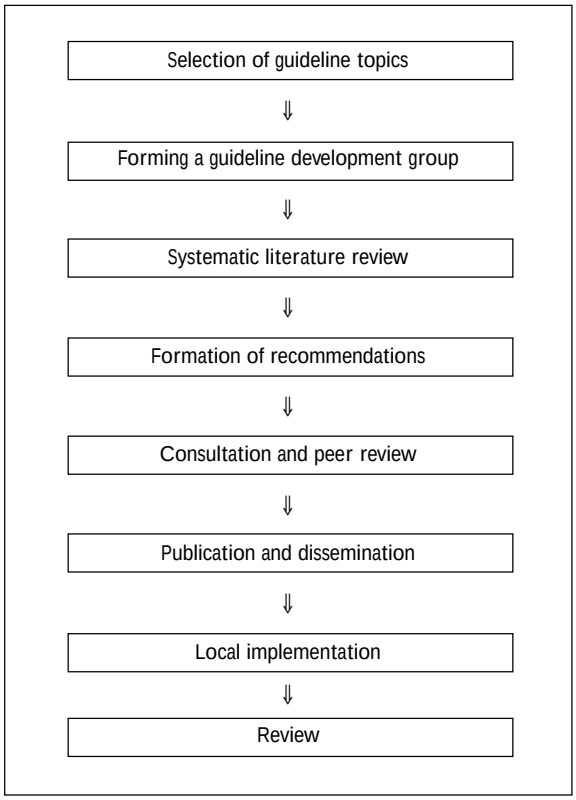
In order to demonstrate the complexity of evidence-based guideline development, the following section describes the process used by SIGN to derive its own guidelines.

THE SIGN APPROACH

SIGN was established in 1993 by the Academy of Royal Colleges and their Faculties in Scotland, to develop evidence-based clinical guidelines for the National Health Service (NHS) in Scotland[5]. It was the vision of the late Professor James Petrie, the founder of SIGN, that the professional organisations in Scotland should work together to produce multi-disciplinary guidelines based on high-quality evidence rather than the then more common method of clinical opinion-based uni-disciplinary guideline development.

The methodology used by SIGN to produce evidence-based guidelines has three main elements, namely: multidisciplinary participation, systematic review of published evidence, and explicit linking of recommendations to the supporting evidence. A full description of SIGN's methodology is available on our website <www.sign.ac.uk>. This methodology has now been replicated in other countries across the world and SIGN has recently published its eighty-second guideline. The process by which SIGN develops its guidelines is shown in Fig. 2.

Fig. 2 Overview of the SIGN guideline development process.



MULTIDISCIPLINARY PARTICIPATION

Multidisciplinary involvement in developing a guideline is essential to ensure professional ownership. SIGN identifies a multidisciplinary group covering all relevant professionals involved in the journey of care for a particular condition. Each group is managed by one of the professional staff within SIGN with dedicated input by an information specialist. In addition, each guideline group involves two patient and carer representatives to ensure that patients' needs are reflected in the questions addressed by the guideline. Fig. 3 shows an example of a guideline development group for lung cancer.

Fig. 3 Example of the composition of a guideline development group for lung cancer.

- Cancer Registry representative
- General physicians
- General practitioner
- Nurses
- Oncologists
- Pathologist
- Patient representatives
- Pharmacist
- Physiotherapist
- Radiographer
- Radiologist
- Respiratory physicians
- Smoking cessation coordinator
- Thoracic surgeons

SYSTEMATIC REVIEW OF PUBLISHED EVIDENCE

The guideline development group decides on the key questions it wishes to address, the areas to be excluded, and the time period to be covered in the systematic review. The information specialist then undertakes a systematic review of electronic databases, other guideline sites and the Internet, using an explicit search strategy devised in collaboration with the guideline development group. An example of the searches undertaken is shown in Fig. 4.

Fig. 4 Example of the range of sources searched for a clinical practice guideline.

- Embase
- MEDLINE
- Cochrane Library
- Canadian Practice Guidelines InfoBase
- National Guidelines Clearinghouse
- Guidelines International Network database
- UK Health Technology Assessment programme
- US Agency for Health Care Research and Quality

The information specialist undertakes a preliminary sift of the material identified to exclude inappropriate material and the group then undertakes a more thorough sift. Once this is

complete, the group reviews each of the remaining papers to assess its quality and usefulness in answering the questions set. This is facilitated by means of checklists for each type of study reviewed, such as randomised controlled trials, case control studies and diagnostic studies. At least two individuals review each paper and the resulting completed checklists are combined into an evidence table that summarises the relevant factual information for each key question.

LINKING OF RECOMMENDATIONS TO THE SUPPORTING EVIDENCE

It is rare for the evidence to show clearly and unambiguously what course of action should be recommended for any given question. In order to address this problem, SIGN has introduced the concept of considered judgement. Under this heading, guideline development groups summarise their view of the total body of evidence covered by each evidence table. This summary view is expected to cover the following aspects:

- Quantity, quality, and consistency of evidence.
- Generalisability of study findings.
- Directness of application to the target population for the guideline.
- Clinical impact (i.e. the extent of the impact on the target patient population, and the resources needed to treat them).
- Implementability (i.e. how practical it would be for the NHS in Scotland to implement the recommendation).

Once they have considered these issues, the group is asked to summarise its view of the evidence and assign a level of evidence to it, before going on to derive a graded recommendation.

SIGN's grading system is shown in Fig. 5. The system places greater weight on the quality of the evidence supporting each recommendation, and on emphasising that the body of evidence should be considered as a whole, and not rely on a single study to support each recommendation. It is also intended to allow more weight to be given to recommendations supported by good quality observational studies where randomised controlled trials (RCTs) are not available for practical or ethical reasons. Through the considered judgement process, guideline developers are also able to downgrade a recommendation where they think the evidence is not generalisable, not directly applicable to the target population, or for other reasons is perceived as being weaker than a simple evaluation of the methodology would suggest.

Fig. 5 SIGN grading system.

Levels of evidence

1++	High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias.
1+	Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias.
1 -	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias.
2++	High-quality systematic reviews of case-control or cohort studies.
	High-quality case-control or cohort studies with a very low risk of confounding bias, or chance, and a high probability that the relationship is causal.
2+	Well-conducted case control or cohort studies with a low risk of confounding bias, or chance, and a moderate probability that the relationship is causal.
2 -	Case control or cohort studies with a high risk of confounding bias, or chance, and a significant risk that the relationship is not causal.
3	Non-analytic studies, e.g. case reports, case series.
4	Expert opinion.

Grades of recommendation

A	At least one meta-analysis, systematic review of RCT, or RCT rated as 1++, and directly applicable to the target population; or
	A systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results.
B	A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or
	Extrapolated evidence from studies rated as 1++ or 1+.
C	A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or
	Extrapolated evidence from studies rated as 2++.
D	Evidence level 3 or 4; or
	Extrapolated evidence from studies rated as 2+.

RCT: randomised controlled trial.

On occasion, guideline development groups find that there is an important practical point that they wish to emphasise but for which there is not, nor is there likely to be, any research evidence. This will typically be where some aspect of treatment is regarded as such sound clinical practice that nobody is likely to question it. These are marked in the guideline as Good Practice Points. These are not an alternative to evidence-based recommendations, and should only be used where there is no alternative means of highlighting an issue.

GUIDELINES IN COUNTRIES WHERE NO GUIDELINE PROGRAMME EXISTS

It is clear that not all countries have the resources available to set up their own guideline development

programme. SIGN has, for example, been in existence for 12 years and employs 18 staff. Where such a level of investment is impossible, healthcare professionals may need to use guidelines produced elsewhere and adapt these for their own local circumstances. If this is the case, then how can healthcare professionals find guidelines and ensure those that they find are of high quality?

FINDING GUIDELINES

The increasing availability of access to the Internet has improved access to guidelines from other countries. Many guideline developers, such as SIGN, make their guidelines available free of charge online and there are a number of sites which collate these. For example, the National Guidelines Clearinghouse in the USA <www.guideline.gov> contains information on more than 1,700 guidelines. A recent addition to the availability of guidelines is the Guidelines International Network (G-I-N) database which brings together guidelines from across the world in addition to supporting material. The G-I-N database is available on subscription and full details are available at: <www.g-i-n.net>.

ASSESSING THE QUALITY OF GUIDELINES

The first criteria for validity of guidelines were published by the US Institute of Medicine in 1990[1]. The recommended "attributes of good guidelines" included validity, reliability, clinical applicability, clinical flexibility, clarity, multidisciplinary process, scheduled review, and documentation. The recommendations were underpinned by the twin themes of credibility and accountability: "The link between a set of guidelines and the scientific evidence must be explicit, and scientific and clinical evidence should take precedence over expert judgement." SIGN's original Criteria for Appraisal of Clinical Guidelines for National Use[6] and the more recent AGREE (Appraisal of Guidelines, Research and Evaluation for Europe) guideline appraisal instrument are based on these founding principles of guideline development. The full appraisal instrument can be downloaded from the AGREE website at: <www.agreecollaboration.org>. The AGREE instrument consists of 23 items covering the domains of: scope and purpose, stakeholder involvement, rigour of development, clarity and presentation, applicability, and editorial independence. Each item is scored on a four-point scale, ranging from "strongly agree" to "strongly disagree" and a score can be generated for each domain.

DECIDING IF A GUIDELINE IS USEFUL

The AGREE instrument is clearly helpful to healthcare professionals seeking some objective measure of the quality of the guideline they are reviewing, but even if a guideline scores well on the AGREE criteria, how can a busy healthcare professional decide if it is useful for his/her practice?

There are some key issues which anyone considering adapting or using a guideline from elsewhere should consider. These may include:

- Does it answer the questions that are relevant in my population? For example, do the questions it addresses refer to technology which is not used in my area?

Good guidelines should make clear the questions they are addressing and also what questions they are not addressing.

- Is it up-to-date? Has practice changed dramatically since it was written?

Guidelines, except those with regular electronic updates, will only reflect the evidence up to the date of publication. Good guidelines should make the time period of the guideline explicit, allowing the reader to assess its helpfulness.

- Will the recommendations be accepted and implemented locally? Are there cultural influences that mean that the recommendations are not "right" for my area? Are there barriers to implementation?

This is probably the most important issue of all. Do the recommendations reflect issues which are significant locally or do they reflect practice in a completely different setting? Another important issue under this heading would be the resource implications of implementing recommendations. If implementation of the recommendations requires large scale retraining or redeployment of staff, then perhaps the guidelines are not right for the local situation.

The G-I-N is currently undertaking work in the area of guideline adaptation to offer support and help to those where this is the only option. Their recommendations are likely to be available next year on the G-I-N website.

FUTURE DEVELOPMENTS IN GUIDELINE DEVELOPMENT

One new development is the concept of "living guidelines". These guidelines are updated on at least an annual basis and therefore the process of development should be streamlined as only one

year's evidence needs to be appraised. This also increases the possibilities for collaboration, as a number of countries can be involved in updating a living guideline.

Other new developments include: new grading systems for recommendations, moving away from emphasis on clinical efficacy alone to emphasising harms and size of effect, inclusion of economic evaluation in the guideline development process, and the role of the consumer in guideline development.

CONCLUSION

Evidence-based clinical practice guidelines offer the busy healthcare professional an opportunity to keep abreast of current evidence and the recommendations that flow from that evidence. They should not, however, be seen as an isolated activity, but rather as an important link in the clinical effectiveness cycle of activities. The development of high-quality clinical practice guidelines is a complex task. As a result, it may not be possible for all areas of the world to develop their own guidelines. Instead healthcare professionals in these areas may seek to access guidelines developed in other areas of the world. It is important that healthcare professionals quality assess any such guidelines before adopting them for local use. It is hoped that further advice on this process will be available in the near future.

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SINGAPORE MEDICAL COUNCIL CATEGORY 3B CME PROGRAMME

Multiple Choice Questions (Code SMJ 200512B)

	True	False
Question 1. Clinical practice guidelines (CPGs) are:		
(a) Intended to help the doctor and his/her patient decide on appropriate healthcare for the patient.	❑	❑
(b) Protocols with precise instructions as to what must be done for a wide range of clinical circumstances.	❑	❑
(c) Useful when there is evidence of variation in practice that affects patient outcomes and a strong research base providing evidence of effective practice.	❑	❑
(d) Legal standards of care and must be applied in all circumstances.	❑	❑
Question 2. Types of CPGs include:		
(a) Guidelines based on expert opinion.	❑	❑
(b) Guidelines developed from formal consensus.	❑	❑
(c) Evidence-based guidelines.	❑	❑
(d) Guidelines with elements of both evidence and consensus.	❑	❑
Question 3. Important methodological elements of CPG development include:		
(a) Unidisciplinary participation.	❑	❑
(b) Systematic review of published evidence.	❑	❑
(c) Explicit linking of recommendations to the supporting evidence.	❑	❑
(d) Expert judgement taking precedence over clinical evidence.	❑	❑
Question 4. Good CPGs:		
(a) Should, given the same clinical circumstance, be interpreted and applied consistently by practitioners.	❑	❑
(b) Should be as applicable to the target population as evidence allows and explicitly state the populations to which recommendations apply.	❑	❑
(c) Should be unambiguous, define terms precisely, and use logical, easy-to-follow modes of presentation.	❑	❑
(d) Should include participation by representatives of key affected groups.	❑	❑
Question 5. Indicate if the following statements are true or false:		
(a) It is not necessary to critically appraise CPGs if they have been developed by a group of eminent clinical experts.	❑	❑
(b) CPGs only reflect the evidence up to the date of publication.	❑	❑
(c) When there are a large number of studies on a particular clinical question, a single randomised controlled trial may be selected to support recommendations on that subject in a CPG.	❑	❑
(d) Controlled studies are a higher level of evidence than non-analytical studies like case reports or case series.	❑	❑

Doctor's particulars:

Name in full: _____

MCR number: _____ Specialty: _____

Email address: _____

Submission instructions:

A. Using this answer form

1. Photocopy this answer form.
2. Indicate your responses by marking the "True" or "False" box ☑
3. Fill in your professional particulars.
4. Post the answer form to the SMJ at 2 College Road, Singapore 169850.

B. Electronic submission

1. Log on at the SMJ website: URL <http://www.sma.org.sg/cme/smj> and select the appropriate set of questions.
2. Select your answers and provide your name, email address and MCR number. Click on "Submit answers" to submit.

Deadline for submission: (December 2005 SMJ 3B CME programme): 12 noon, 25 January 2006

Results:

1. Answers will be published in the SMJ February 2006 issue.
2. The MCR numbers of successful candidates will be posted online at <http://www.sma.org.sg/cme/smj> by 20 February 2006.
3. All online submissions will receive an aotomatic email acknowledgment.
3. Passing mark is 60%. No mark will be deducted for incorrect answers.
4. The SMJ editorial office will submit the list of successful candidates to the Singapore Medical Council.