

[XMLGuide – The Medical Guidelines Solution](#)

# XMLGuide Project Report: Implementing Clinical Guidelines

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## 1. Introduction

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**Clinical Guidelines are by definition systematically constructed documents that outline suggested actions for specific clinical circumstances based on the best available evidence.**

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Clinical Guidelines are defined by The Institute of Medicine as ‘systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances’<sup>1</sup>.

The National Guidelines Clearinghouse (US) sets the following criteria<sup>2</sup> for a guideline:

*A clinical practice guideline must meet all of the following criteria to be included in the NGC:*

*The clinical practice guideline contains systematically developed statements that include recommendations, strategies, or information that assists physicians and/or other health care practitioners and patients make decisions about appropriate health care for specific clinical circumstances.*

*The clinical practice guideline was produced under the auspices of medical specialty associations; relevant professional societies, public or private organisations, government agencies at the Federal, State, or local level; or health care organisations or plans. A clinical practice guideline developed and issued by an individual not officially sponsored or supported by one of the above types of organisations does not meet the inclusion criteria for the National Guideline Clearinghouse™).*

*Corroborating documentation can be produced and verified that a systematic literature search and review of existing scientific evidence published in peer reviewed journals was performed during the guideline development. A guideline is not excluded from the National Guideline Clearinghouse™ if corroborating documentation can be produced and verified detailing specific gaps in scientific evidence for some of the guideline’s recommendations.*

*The guideline is English language, current, and the most recent version produced. Documented evidence can be produced or verified that the guideline was developed, reviewed, or revised within the last 5 years.*

Guidelines have played an increasing role in the practice of medicine worldwide<sup>3</sup>, but have differed in their methods of construction, dissemination and implementation.

Guidelines should influence both clinician and patient behaviour, and a number of factors have been identified as affecting their impact on delivery and healthcare outcomes. This report seeks both to summarise the current evidence in this field, and look at the implications for future, computer based delivery.

## 2. Why use clinical guidelines?

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**Guidelines should offer a systematic distillation of up to date, relevant evidence. This should then help the clinician to make the most appropriate decisions about patient management. There is evidence to suggest that when clinicians' management decisions are analysed they do not often match the currently defined best practice.**

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It can be taken as a given truth that in a field that is changing as rapidly as modern medicine clinicians need up to date information to help them formulate decisions. Questions and areas of uncertainty occur often during clinical practice<sup>4</sup>. The time to access the needed information is often limited, which in turn influences the knowledge source that is used.

There are many hundreds of medical journals, and thousands of research papers produced each year.

The US based online research database, PubMed<sup>5</sup>, has indexed over 11 million research citations dating back to the 1960s, with 2632 current journals accessible online as of February 3<sup>rd</sup> 2002. Textbooks, by their very nature in such a complex field, tend to be out of date even on the day they are published.

Brian Hurwitz<sup>6</sup> has noted that discussion of the use and value of clinical guidelines stretches back to Plato.

The Institute of Medicine definition – “*systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances*” – of what a guideline is also defines their purpose. They should contain the distillation of currently available evidence relevant to a specific clinical situation, and how it may be applied.

Guidelines may also fulfil an organisational role. The process of either locally drawing up a new, or adopting an existing national, guideline naturally allows an analysis of how treatment is delivered. The guideline itself may then form the basis for ongoing re-evaluation of how that aspect of service is delivered, through regular clinical audit.

Clinicians may perceive guidelines defining treatment paths for specific situations, with attendant resource implications, as a threat to clinical freedom. The health service manager, however, may see the potential for more consistent, effective and efficient health care delivery as central to the case for guideline implementation. Also the patient can feel their freedom to choose between treatment options is threatened (cf MMR debate in the UK 2002).

The theoretical case for guideline implementation can be made. Whether the considerable effort expended on attempting to do so is worthwhile must be judged by whether clinical practice changes for the better. Here the evidence is not always as strong as proponents of guidelines would wish.

There is some clear evidence as to the varying quality of existing health care delivery – the current state of medical practice which statutory bodies, politicians and health care administrators may wish to influence.

One recent example originates from a systematic review of research into primary care standards in the UK, Australia and New Zealand<sup>7</sup> (compared with national guidelines or other existing standards identified by the research team). This study found that even quite basic components of medical management for important chronic conditions were often found lacking.

What is also clear is that the process of guideline production, adoption and dissemination (both to and then within an organisation) and subsequent reinforcement and maintenance is crucial to their success. It is a discussion and analysis of the important elements of this process which forms the basis for the rest of this report.

## **3. Benefits and Harm**

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**There are theoretical benefits to using well constructed guidelines in clinical situations. Balanced against this must be the potential harm – constriction of clinician behaviour, coarsening of complex management processes and the often hidden costs of developing and implementing guidelines in an organisation.**

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For the busy clinician the main aim of using a guideline must be to improve the standard of care that they deliver to their patients. Guidelines can achieve this<sup>8</sup>. The main pitfalls in using guidelines stem from the quality of information they contain and how flexibly they are implemented and used in clinical situations.

Guidelines may reduce variation between practitioners, replacing ill proven methods with those shown to provide benefit from systematic review. They thus can have a general educational role. They also allow a framework for good practice, and the clinical benefits following from it, to be measured using continuous quality improvement methods such as clinical audit.

For organisations guidelines may help implement uniformity of care delivery and may also be used to achieve maximum cost / benefit.

Ineffective guideline introduction may come from poor construction, poor dissemination or inadequate implementation. Each of these areas is discussed in more depth later in this report, but it must be borne in mind that proper guideline design and use does in itself consume resources, and so ineffective management of the process of introducing a guideline will have cost implications that in turn will impact on the overall budget for health care provision in an organisation.

Guidelines should be constructed from an evidence base using systematic review methodology. Failure to do so will inherently lead to bias in the document. This can be compounded by trusting ‘expert’ opinion<sup>9</sup>. Time or resource pressures may also influence the process. Having no guideline at all may be preferable to having a poorly constructed or politically biased one.

There is also a risk that guidelines may lead to inflexible practice. This can occur at several levels. For an individual clinician the complexities of everyday practice maybe coarsened by over reliance on authoritative guidelines.

At a service level the very ease of measuring practice that can be potentially guideline based may lead to subtle or overt pressures to mould clinician’s behaviour to the guideline rather than allowing clinical freedom – the very existence of a guideline can lead to targets being produced around one clinical situation to the detriment of other problems that are harder to quantify and measure.

At a strategic management level guidelines can be used as a method of resource allocation and control – obviously this can be beneficial if cost savings can be made by recommending an equally efficacious but cheaper drug, but overly rigid control of care delivery can have disadvantages with individual patients.

## 4. Legal Implications

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**The existence of clinical guidelines does not change the legal responsibilities and duty of care of the healthcare professional.**

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Guidelines, according to The Institute of Medicine, are “*systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances*”<sup>10</sup>.

There have been moves to develop a mandatory model in some areas and countries – for example the Human Embryology Act in the UK, and France has over a hundred guidelines made mandatory under statute<sup>11</sup>.

Generally in UK law professionally generated standards are used in court, provided by expert witnesses, rather than guidelines. The locus classicus of the test for the standard of care required of a doctor or any other person professing some skill or competence is the direction to the jury given by McNair<sup>12</sup> (‘The Bolam Test’):

*“I myself would prefer to put it this way, that he is not guilty of negligence if he has acted in accordance with a practice accepted as proper by a responsible body of medical men skilled in that particular art . . . Putting it the other way round, a man is not negligent, if he is acting in accordance with such a practice, merely because there is a body of opinion who would take a contrary view.”*

This allows for minority professional opinion to be followed – this makes sense in any professional scientific community where practice will tend to evolve over time in the manner described by Kuhn<sup>13</sup>. ‘The Bolam Test’ is a professionally situated one ~ originating from a body of professional opinion stating what is acceptable practice, not the best scientific evidence for what should have been done.

Assuming widespread use of guidelines and their explicit statements of situations and actions this may change, but the mere existence of a guideline “*...does not of itself establish that compliance with it is reasonable, or that non-compliance is negligent*”<sup>14</sup>

There is little case law to test whether the authors of guidelines hold legal responsibility – as with all medical books it is reasonable to expect that the user will inform their actions with further enquiry and information. Individual, professional responsibility (after all it is the doctor who owes the duty of care to the patient, not the author) remains.

It seems that overall legally the individual doctor’s judgment and discretion remain paramount in determining responsibility for supposed / alleged negligence.

## **5. Return on Investment – The Business Case for Guideline Use**

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**The introduction of guidelines should be viewed as a business process, with a formal cost / benefit analysis, but this is usually a complex calculation. Developing and implementing guidelines effectively requires sufficient allocation of resources.**

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Guideline implementation can improve clinical practice and outcomes – particularly when part of a more intensive educational effort or incorporating structured prompts<sup>15</sup>, but may involve an increase in direct costs for the healthcare organisation involved – for example improving the monitoring and treatment of asthma may increase the prescribing of prophylactic drugs for a primary care practice ~ whilst potentially lowering the need for admissions to secondary care from the treated population.

Clearly calculating cost and benefit is very likely to be a complicated undertaking.

What is also apparent is that a strategy for successful implementation of guideline will require much more investment of resources than simply a national committee publishing an authoritative document. Even when clinicians are widely aware of a guideline they may still not follow it routinely<sup>16</sup>.

It is simplest to focus on simple clinical situation / single drug guidelines to determine the benefit ~ for example more accurately tailoring a drugs use to evidence based guidelines in a hospital may produce significant savings from the pharmacology budget to offset the organisation's investment in developing and implementing the guideline<sup>17</sup>.

Guidelines about guidelines exist, drawn up from available research evidence, and suggesting a significant degree of rigour, and the resources needed to ensure it, is necessary to develop effective documents. Eccles et al<sup>18</sup> have identified three existing key components of guideline methodology:

- 1. identification and synthesis of the evidence should be done using the methods of systematic review to maximise the appropriate identification of evidence*
- 2. the guideline development group should be appropriately multidisciplinary to ensure full discussion of relevant evidence, associated service delivery issues, and the appropriate construction of recommendations;*
- 3. the recommendations in the guideline should be clearly and explicitly linked to the evidence supporting them.*

In the same paper they note that The Committee on Clinical Practice Guidelines in the USA<sup>19</sup> have suggested that implications about the cost implications of alternative actions should be included in guidelines, although the data for this information is often incomplete and poor. They suggest overtly incorporating health economics into the methodology of guideline development.

They go on to express the difficulty in calculating the broader costs for interventions in chronic disease such as asthma and diabetes. Calculations based on potentially value biased measures of health improvement may also distort such calculations.

## 6. Authoring & Methodology

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**There is an increasingly robust research base for suggesting the key elements of guideline development methodology – both for the systematic authoring of documents and the formal management of guideline development group processes.**

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Eccles et al have identified their [three key components](#) for guideline construction (see section 5 above) – essentially constructing the guideline from systematic review of the evidence and aligning this evidence with factors related to service delivery.

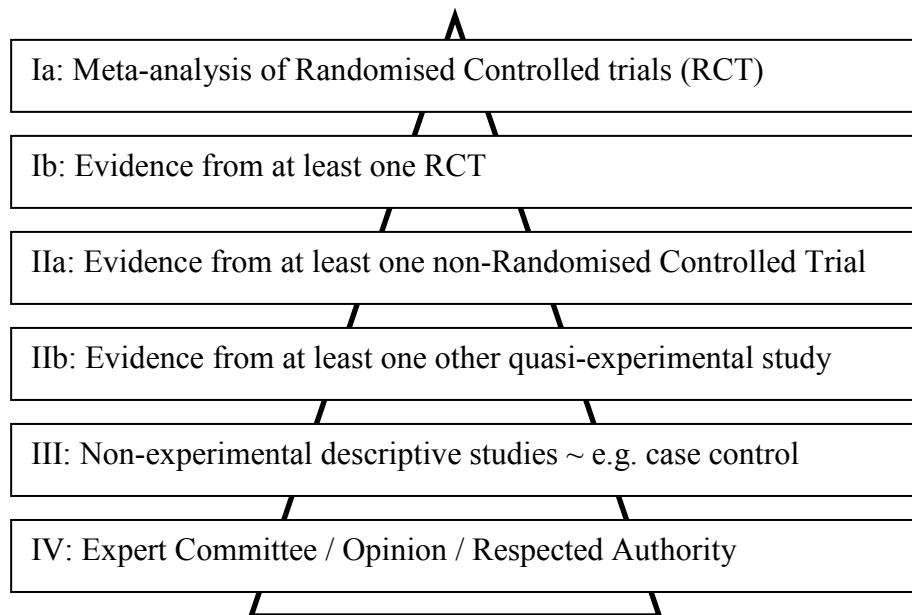
The development process has been broken down into five steps by Shekelle et al.<sup>20</sup>:

1. *identifying and refining the subject area of a guideline*
2. *convening and running guideline development groups*
3. *assessing the evidence about the clinical question or condition*
4. *translating the evidence into a clinical practice guideline*
5. *external review of the guideline*

Other important points made in this important paper include:

- Failure to refine the subject can lead to a form of ‘guideline creep’ where an attempt is made to produce an overly inclusive document, creating a mammoth and unworkable task.
- Analysing / mapping the existing process of management of a disorder can help identify gaps in both the evidence base and treatment.
- Group membership – should be both appropriately multi-disciplinary from a clinical perspective and cover a number of defined roles (with the required skills) in the guideline process. The guideline group should be managed using formal group processes – which is reinforced by Rycroft-Malone<sup>21</sup>

**Levels of Evidence in assessing research for inclusion in a guideline development process:**



## 7. Dissemination & Implementation

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**The process of implementing a guideline is an organisational issue – including social and psychological factors. Research suggests the need for active processes and incorporating the guideline’s implementation in to a wider clinical governance / formally managed change process.**

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Simply publishing a guideline is not enough, as a review in the Cochrane Database states<sup>22</sup> -

*“The effects of printed educational materials compared with no active intervention appear small and of uncertain clinical significance.”*

Influencing the actions of local opinion formers does have an impact, although it may be unpredictable<sup>23</sup>. An interaction between the perceived value of a guideline and other clinicians’ behaviour has also been identified<sup>24</sup>. The particular importance of local activity is discussed in Section 8 below.

Theoretical frameworks have been proposed, based on an incomplete research base, a common theme being a whole system approach to change ~ for example in proposing key elements of change:<sup>25</sup>

- Change agents must identify with clinicians’ concerns
- It is important to assess stage of readiness to change and the specific nature of barriers to change
- Multiple change strategies are more effective than single ones
- Clinician education must include a focus on knowledge, attitudes, and skill development
- Educative strategies must be interactive and participatory
- Social influence can be a powerful behaviour change facilitator or inhibitor
- Environmental support is crucial to the initiation and maintenance of change

A detailed Dutch observational study in primary care has identified a number of factors important (i.e. if present they appear to exert a significant negative or positive influence) to successful implementation<sup>26</sup>:

- 1) *The recommendation is based on scientific evidence—an explicit description of the scientific evidence for the recommendation is available; the research evidence is straightforward and not conflicting; the recommendation is based on the results of well designed clinical trials or meta-analyses*
- 2) *The recommendation is based on clear and convincing arguments that are based on extensive clinical skills and experience*
- 3) *The recommendation is concerned with a relevant aspect of care in daily practice*
- 4) *The recommendation helps doctors to solve patients’ problems in daily care — it is concerned with difficult decisions or choices in daily care and it makes work easier*
- 5) *The recommendation is one of the key features of the guideline — it is a central element in the guideline and represents the central aim*

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- 6) *The recommendation provides a concrete and precise description of desired performance—it gives detailed advice on which performance is appropriate in which situation and in what patient group and determines which factors or conditions should be taken into account*
- 7) *The recommendation is vague and not specific*
- 8) *The recommendation is complex—it is composed of many different elements and contains a complex decision tree or many different conditional factors influencing performance*
- 9) *The recommendation is not compatible with existing norms and values in practice—it is controversial and provokes discussion*
- 10) *The recommendation demands the acquisition of new competence (knowledge, skills)—it can be followed only when a doctor has specific knowledge and skills*
- 11) *The recommendation has specific consequences for practice management—it requires adaptations in the organisation of care processes or demands extra resources, staff, equipment, etc*
- 12) *The recommendation demands changing existing routines and habits and leaving what is seen as common practice in the target group*
- 13) *The recommendation will provoke negative reactions in patients because it does not fit their common expectations — it may lead to a conflict of interest between patient and doctor*
- 14) *The recommendation will provoke negative reactions among colleagues because it is not compatible with their views, position, or tasks*
- 15) *The recommendation can be tried without any risks of possible damage for patients — experimenting with the proposed performance will not have negative effects on the health of patients*
- 16) *The recommendation has been mentioned in the media and in implementation programmes*

The specific form of the guideline can be significant – for example in an A&E department distribution of a head injury guideline on a small card<sup>27</sup> has proved partially successful ~ but the success related to the overall departmental attitude to the guideline also. The same group in a later study<sup>28</sup> (again looking at head injury management in A&E Departments) found that guideline dissemination alone did not seem to consistently improve the record keeping and decision making – and highlighted the need for an implementation strategy.

The inclusion of guidelines in the continuous quality improvement processes – the audit cycle – shows a method whereby practice evolves actively around implemented guidelines / standards.

The importance of evaluation of local implementation strategies within UK NHS Trusts has been raised<sup>29</sup>. This important aspect is expanded in the next section of this report.

## 8. The Evidence for the Importance of Local Adoption

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**Active local adoption is a key process in the successful implementation of a guideline in a local health care organisation.**

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It has been identified that local implementation of a guideline can be a mainly small 'p' political process<sup>30</sup>. That an active local process is needed for implementation to have an impact is reinforced by the weight of evidence, much of it already alluded to earlier in this report.

It can be difficult to research local strategies and tactics for implementation, due to the methodological difficulties<sup>31</sup> when addressing practice changes, and detecting changes in patient outcomes.

There is evidence that doctors who develop their own guidelines improve outcomes<sup>32</sup>, however this cannot be extended across all specialties for small health care units – due at least in part to resource implications. However, simply resorting to guideline distribution and didactic CME sessions does not appear to produce sustained success.

This weakness of supporting guidelines with lectures alone has been identified in other professional groups in medicine<sup>33</sup>

### Factors Influencing Implementation at a Local Level

Physical	Availability of Information – Prompts, Cards ~ supporting problem solving cf. traditional education.  Where Education is used it should be interactive, not didactic
Psychological	Identify form of interventions that influence individuals practice – cognitive behavioural / ABC [Antecedents / Behaviour / Consequences] approach ~ identify reinforcement strategy
Social	Identifying and Overcoming political barriers within the organisation  Importance of group process – opinion formers

For the effort to be put into these elements requires a sense of local ownership of the guideline – itself identified as a key factor<sup>34</sup>. A failure to construct a strategy across traditional primary / secondary care boundaries (with a guideline 'owned' by the whole system) may lead to a failure to improve total care<sup>35</sup>.

## **9. Evaluation and Maintenance**

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**Guidelines, based as they are on best evidence, are by nature living, dynamic documents. They should be regularly evaluated using the available instruments.**

**It is important to address this ongoing maintenance in planning their implementation, and a process should be defined.**

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The implementation of clinical guidelines into practice is, as is clear from the research already detailed, by nature a cyclical process as medicine develops.

Once developed there should be an ongoing cycle of assessment / review. A guideline can be reviewed either when new evidence is produced, or at a fixed time interval ~ following the more structured development model above would suggest, due to resource implications, that scheduling may be most effective, with the facility for more urgent update should this be necessary.

Shekelle et al<sup>36</sup> have proposed a simple, robust model for review.

### **Appraisal Instruments**

Instruments for guideline appraisal exist and have been validated.

The [St Georges Instrument](#)<sup>37</sup> is available with a methodological handbook. A German initiative by the Agency for Quality in Medicine<sup>38</sup> reached a similar (but less formalised as an instrument) set of conclusions about evaluating guideline methodology.

A further multinational collaboration has produced the AGREE instrument<sup>39</sup> - a structured framework for assessing guideline quality.

### **Clinical Audit and Standards**

Existing processes to produce improvement in practice and outcomes have been developed – Continuous Quality Improvement (CQI), whether framed as Clinical Audit or the wider Clinical Governance concept.

The process of Clinical Audit is the ‘audit cycle’. All six essential stages reflect continuous measurement that ensures quality of care is protected and/or enhanced:

1. Identify the problem issue
2. Develop standards / guidelines
3. Assess and measure quality against these standards
4. Identify change needed
5. Implement change – implement guidelines
6. Monitoring effects

The cycle means there can be a focus on one issue after another dependent on the results and conclusions, essentially, re-audit.

The overlap between these processes is clear, for example a standard definition of clinical audit:

*”Clinical Audit involves systematically looking at the procedures used for diagnosis, care and treatment, examining how associated resources are used and investigating the effect care has on the outcome and quality of life for the patient”*

**Department of Health Definition (1993)**

Guidelines have also been developed into the process of “Integrated Care Pathways”:

*“... structured multidisciplinary care plans which detail essential steps in the care of patients with a specific clinical problem.”<sup>40</sup>*

Whatever the route or process chosen it is an active, ongoing cycle of guideline development, implementation and evaluation that is necessary to achieve incremental practice change over time.

## 10. Current Electronic Guideline Systems

There are a number of guideline systems, primarily developed from a collaborative academic model. In the UK there are a number of internet sites that have drawn together the available national guidelines, but the majority of content available is not distributed or displayed in a flexible, clinically usable, format.

### Knowledge Management Systems

The internet portal OpenClinical<sup>41</sup> details a number of systems that have been developed to develop and implement guidelines. They state very clearly the aims of such systems:

*“There is a clear need for effective guideline-support tools at the point of care and at the point of critiquing, which will relieve the current information overload on both care providers and administrators. To be effective, these tools need to be grounded in the patient’s record, must use standard medical vocabularies, should have clear semantics, must facilitate knowledge maintenance and sharing, and need to be sufficiently expressive to explicitly capture the design rational (process and outcome intentions) of the guideline’s author, while leaving flexibility at application time to the attending physician and their own preferred methods”<sup>42</sup>*

Reference to systems and tools can be found on the excellent [OpenClinical](#) site, the following list has been composed from this source and internet searches:

System	Sponsor	URL	Comment
Arden Syntax		<a href="#">Arden Standard</a>	The Arden Standard provides a framework for the representation and documentation of medical logic, but does not include development methods or tools.
ASBRU	ASGAARD project	<a href="#">Asgaard - Stanford site</a>	Intention (i.e. goal) -based formal representation language for modelling guidelines
GUIDE	Laboratory of Medical Informatics at the University of Pavia.	<a href="#">Laboratory of Medical Informatics</a>	Careflow - clinical workflow - integrates best practice patient management, specified in clinical guidelines, with strong support for the business process aspects of patient care (organization structure, actors, roles and resources)
Dharma	EON project		Component-based guideline model
GEM	Yale Center for Medical Informatics	<a href="#">GEM cutter</a> / <a href="#">GEM-Q</a>	An XML-based mark-up model for guideline documents
GLIF3	Intermed Collaboratory	<a href="#">GLIF3</a>	provides a task model for workflow and decision making, and executable action specifications

<i>Path.Finder</i>	Consortium of UK Hospitals (currently 12 Trusts)	<a href="http://www.pfconsortium.com/">http://www.pfconsortium.com/</a>	Some use of XML
<i>Prodigy</i>	<a href="#">SCHIN</a>	<a href="#">PRODIGY3 guideline model</a>	
<i>PROforma</i>	<a href="#">Cancer Research UK</a>	<a href="#">PROforma</a>	Formal knowledge representation language for authoring, publishing and executing clinical guidelines

In the UK what is lacking is a widely adopted system in secondary care (although to some extent the situation in primary care is more advanced). The largest project we have identified is the Path.Finder Consortium of 12 – 14 UK NHS Trusts.

## **The Internet (UK Perspective) – Key Sites / Methods**

There are a large number of guideline sites across the world, see [i-medicine.info](#) for links.

The following UK list is very incomplete, but broadly representative of the approaches taken, and allows some general conclusions to be proposed.

Name / Link	URL	Comment
<i>Doctor Online</i>	<a href="http://www.doctoronline.nhs.uk/">http://www.doctoronline.nhs.uk/</a>	NHS sponsored directory resources with collated, peer reviewed guidelines for all specialties.
<i>Dr.Net</i>	<a href="http://www.doctors.net.uk/">http://www.doctors.net.uk/</a>	Doctors only portal. Provides access to Cochrane database and some textbooks / knowledge sources
<i>EBOC</i>	<a href="http://www.eboncall.co.uk">http://www.eboncall.co.uk</a>	From Centre for Evidence Based Medicine – explicit methodology, guidelines designed for rapid access in clinical situations
<i>National Electronic Library for Health</i>	<a href="http://www.nelh.nhs.uk/">http://www.nelh.nhs.uk/</a>	NHS site – has own guidelines database and links to primary sources

The broad conclusion drawn from the internet resources available is that they are good document sources, but any guidelines offered on the internet in the UK are substantial documents rather than being aimed at acute use. One source designed specifically with this acute need for information is the EBOC project, developed for on-call use by doctors, which does aim to provide both guides that can be used in the acute clinical setting and also links to the evidence supporting them. In each of these sources the need and potential for local customisation has not been addressed fully.

See [Appendix I](#) for a fuller list of UK Guideline Content Providers.

For more details of guideline providers and additional relevant links and materials try [i-medicine.info](#).

## **11. Summary**

The implementation of guidelines in clinical practice is a complex area. Key elements for success include an active local adoption process, which itself is part of an ongoing evaluative process. Electronic systems that provide guideline information – either through a knowledge management system or by a context driven decision support system - may also need to address these issues which are related to organisational psychology theory more than the structure or presentation method of the system.

## **12. Appendix I - UK National Guideline Providers<sup>43</sup>**

British Association of Neurologists (2)  
British Cardiac Society (16)  
British Society of Gastroenterology (22)  
British Thoracic Society (13)  
Centre for Evidence Based Mental Health, Oxford (3)  
Centre for Health Sciences Research, Newcastle (4)  
Department of Health (8)  
Diabetes UK (6)  
Joint Royal Colleges Ambulance Liaison Committee (1)  
Medical Society for the Study of Venereal Diseases (24)  
NHS Trent Regional Office (1)  
NICE (39)  
PRODIGY (133)  
Public Health Laboratory Service (58)  
Royal College of Anaesthetists (6)  
Royal College of General Practitioners (2)  
Royal College of Midwives (21)  
Royal College of Nursing (5)  
Royal College of Obstetricians and Gynaecologists (49)  
Royal College of Ophthalmologists (8)  
Royal College of Paediatrics and Child Health (6)  
Royal College of Pathologists (8)  
Royal College of Physicians (3)  
Royal College of Psychiatrists (33)  
Royal College of Radiologists (8)  
Royal Pharmaceutical Society (4)  
SIGN (45)

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