Guidelines in the United Kingdom and How They Are Used

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The main sources of guidelines in kidney disease in the United Kingdom are the National Institute of Health and Clinical Excellence (NICE), the UK Renal Association, and the Scottish Intercollegiate Guideline Network (SIGN). These groups now all adopt similar methods of guideline development, but implementation methods differ and also vary in their effectiveness. The structure of UK health care lends itself to an integrated implementation strategy, and the United Kingdom is almost unique in being able to introduce simultaneously related changes that aid implementation nationally, thereby enabling implementation locally. Use of these strategies is variable with possibly too much reliance on existing systems that deliver predictable suboptimal results and a failure to embed implementation strategies into routine organizational structure. The next steps for us in the United Kingdom are to use service improvement methods to improve and sustain consistently implementation of evidence-based practice.

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Guideline development has become a growth industry, partly driven by the need to make some sense out of the explosion of scientific literature during the past 20 yr and partly by a desire both to improve the quality of health care provided and to control the cost of its provision. The purpose of this article is to review briefly the history of guideline development in kidney disease in the United Kingdom, the method currently used both to develop and to implement these guidelines, and the success (or otherwise) of implementation and finally to discuss ways in which we might improve adherence to clinical practice recommendations in the future. The concepts underpinning guidelines are applicable across the board, and although every health care system has areas that are unique to that particular country, there will be also be aspects of development, implementation, and adherence that are applicable to any and every health care system.

Guideline Concepts and What They Can Do for Us

Guidelines are by no means a new concept, and their utility has been debated for centuries. Plato (BC 427 to 347) had a conceptual interest in guidelines and set up a thought experiment in which doctors would be stripped of their clinical freedom and formed into councils to determine majority views about how to practice medicine in all situations. Plato was not a supporter of the guideline concept, maintaining that however effective health care by guideline turned out to be—and he was prepared to concede its potential—it remained in his view a debased form of practice. He argued that guidelines presuppose an average patient rather than the particular patient whom a doctor is endeavoring to treat and also that the knowledge and analysis that go into the creation of guidelines are rooted not in the mental processes of the clinicians who see the patient but in the minds of guideline developers who are distant from the consultation. Guideline developers, however, would contend that clinical practice guidelines (CPGs) allow health professionals to use their knowledge and skills in deciding when to depart from a guideline during treatment of an individual patient, rather than spend time and mental energy repeatedly making things up as they go along. Despite his affirmed opposition to guidelines, this is actually in keeping with Plato's cave allegory (Figure 1). Plato envisioned an underground cave in which we are chained and fettered, able only to look straight ahead and unable to look from side to side or to communicate effectively with each other. The chains are our ignorance, our resistance to change, and our comfort with custom and convention. All we see are shadows of reality thrown onto the wall in front of us by figures and objects moving in front of the fire and the diffused sunlight from the world outside. These shadowy, imperfect images are the only impressions we will have unless we can break the chains of ignorance with education. Only with education can we emerge from the cave into the outside world and see things as they really exist, rather than as indistinct representations on the cave wall. The problem in our modern world of information technology and the Internet is that we have a bewildering number and array of sources of information by which to be educated. What guidelines can do for us is to sort, sift, and assess the quality of the information and then prioritize the evidence for us, striking off the chains of our ignorance and allowing us to emerge into the sunlight and see the world for what it really is.

If guidelines are developed and used to their fuller potential, then they can also do a lot more than this. They already provide recommendations for the treatment and care of people by health professionals, and they can also be used to develop standards to assess the clinical practice of individual health professionals and the quality of care provided by different groups of providers. They can be used in the education and

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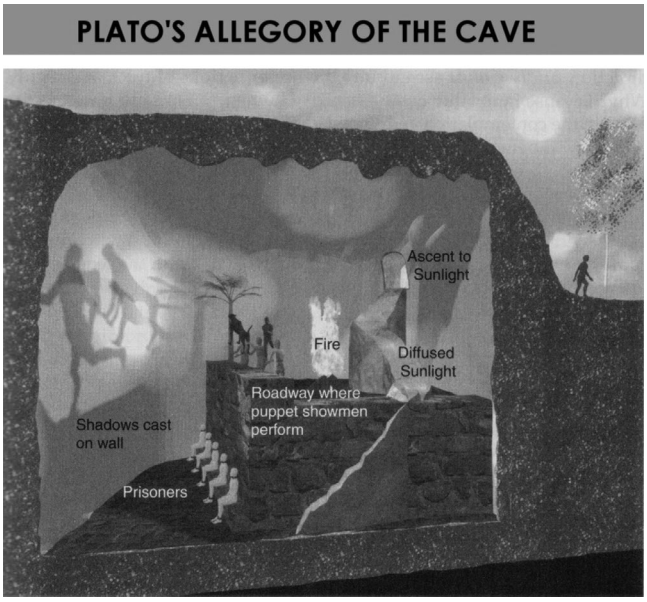

Figure 1. Plato's allegory of the cave. The chains, representing ignorance, constrain our ability to see the real world, which is therefore represented only by shadows.

training of health professionals, and they can help patients to make informed decisions. Use of guidelines to develop care pathways can increase the reliability of health care ("getting it right first time"), thereby reducing the costs of care. Finally, they can be used to improve communication between the patient and his or her health professional(s).

Guideline Developers in Kidney Disease in the United Kingdom

Three groups have been chiefly involved with development of guidelines that relate to kidney disease in the United Kingdom: The National Centre for Health and Clinical Excellence (NICE), the Renal Association (RA), and the Scottish Intercollegiate Guideline Network (SIGN) (1–3). Other groups include the UK Chronic Kidney Disease guideline development group (a group that arose from the Royal College of Physicians specialty committee for renal disease) and the Clinical Resource Efficiency Support Team, which produces Guidelines for Chronic Kidney Disease in Northern Ireland (4,5). This article concentrates on NICE and the RA CPGs, but it is important to stress that in our clinical practice and in our guideline development, we also take notice of and pay attention to the other groups and also major outside agencies such as Kidney Disease Outcomes Quality Initiative (KDOQI), Kidney Disease: Improving Global Outcomes (KDIGO), and the European Best Practice Guidelines.

NICE came into being in 1997. Across all specialties, NICE has now produced 106 CPGs, 171 health technology assessments, and 290 procedural guidance documents. In its early years, NICE (deservedly) received some fairly harsh criticism (6–8), but it has since evolved into an organization that can be justifiably proud of what it has achieved. This was perhaps best reflected in an editorial comment from the *British Medical Journal* suggesting that "NICE may prove to be one of Britain's greatest cultural exports, along with Shakespeare, Newtonian physics, the Beatles, Harry Potter, and the Teletubbies" (9). In chronological order, areas for which NICE has produced guidance in kidney disease include technology appraisals of home hemodialysis and immunosuppressive therapy for transplantation; a CPG for anemia management; a technology appraisal of Cinacalcet; procedural guidance for laparoscopic insertion of peritoneal dialysis catheters; and, finally, published last year, a CPG for the early identification and management of chronic kidney disease (CKD).

The RA is older and in 2010 celebrates its 60th birthday; however, for much of its existence, it not only ignored service development but in its earlier years also eschewed any interest in treatment modalities for ESRD (10). It was not until 1995 that the RA produced the first of what were referred to as the standards documents. With successive editions in 1997 and 2002, these documents became more inclusive and were developed in collaboration with transplanters, intensivists, and pediatricians. The fourth edition saw major changes, evolving into CPGs with the injection of increased rigor in development, improved peer review, audit measures for each recommendation, and purely electronic publishing (11). The aim of these changes was to introduce a rolling program of continual update, widening the areas of practice and embracing the latest evidence on which to base practice.

Guideline Development Methods

Some of the key attributes of guideline development are blindingly obvious, others less so, but what is clearly required is consistency in approach. The guideline development industry, like any other industry, needs some regulation, and this is provided by the Appraisal of Guidelines for Research & Evaluation (AGREE) collaboration (12), which has developed 23 criteria for guideline development grouped under six different headings (Table 1).

One key area is rigor in development. AGREE requires systematic methods to be used to search for evidence, the criteria for selecting the evidence should be clearly described, and there should be an explicit link between the recommendations and the supporting evidence. Herein lies a major problem in the field of kidney disease: The lack of high quality evidence on which to base our practice in nephrology. This was underlined by Strippoli *et al.* (13), who demonstrated exactly where we sit as a specialty on the randomized, controlled trials (RCTs) ladder in an article in *JASN* in 2004 (the bottom rung). Figure 2 details the number of articles in PubMed published on human kidney disease in the past 18 yr, split into three 6-yr time periods. Successive time periods have seen not only a marked increase in practice guideline publications but also a staggering rise in the total number of publications in each time period, to more than 71,800 in the past 6 yr. Admittedly, there has been an increase in the proportion of high-quality evidence (RCTs and meta-analyses) in these articles from 2.56 to 2.77 and 3.47% in successive time periods, so we are at least improving, but it is apparent that much of the evidence that we use to make our clinical practice recommendations is observational. Although

Table 1. The AGREE criteria

Scope and purpose
1. The overall objective(s) of the guideline is (are) specifically described.
2. The clinical question(s) covered by the guideline is (are) specifically described.
3. The patients to whom the guideline is meant to apply are specifically described.

Stakeholder involvement
4. The guideline development group includes individuals from all the relevant professional groups.
5. The patients' views and preferences have been sought.
6. The target users of the guideline are clearly defined.
7. The guideline has been piloted among target users.

Rigor of development
8. Systematic methods were used to search for evidence.
9. The criteria for selecting the evidence are clearly described.
10. The methods used for formulating the recommendations are clearly described.
11. The health benefits, side effects, and risks have been considered in formulating the recommendations.
12. There is an explicit link between the recommendations and the supporting evidence.
13. The guideline has been externally reviewed by experts before its publication.
14. A procedure for updating the guideline is provided.

Clarity and presentation
15. The recommendations are specific and unambiguous.
16. The different options for management of the condition are clearly presented.
17. Key recommendations are easily identifiable.
18. The guideline is supported with tools for application.

Applicability
19. The potential organizational barriers in applying the recommendations have been discussed.
20. The potential cost implications of applying the recommendations have been considered.
21. The guideline presents key review criteria for monitoring and/or audit purposes.

Editorial independence
22. The guideline is editorially independent from the funding body.
23. Conflicts of interest of guideline development members have been recorded.

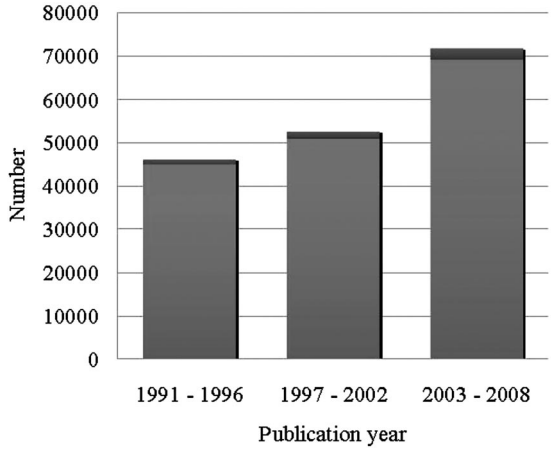

Figure 2. PubMed articles: Human kidney disease 1991 through 2008. The numbers in the columns are the numbers of published articles on human kidney disease in the time period, and red areas at the top of the columns represent RCTs and meta-analyses (2.56, 2.77, and 3.47% of all articles in successive time periods).

observational studies are essential for gaining knowledge of the potential causes and pathogenesis of many diseases and are relatively cheap to perform and also represent an essential means to generate and investigate hypotheses, they cannot demonstrate cause and effect; they can only describe associations. One way of strengthening the associations described by observational studies is the use of propensity scores. The way this works is that the population in an observational study can be quasi "randomized" into a treatment group by determining their propensity to belong to that group. In other words, the propensity score is the probability that an individual belongs to a treatment group on the basis of the individual's background characteristics (covariates); however, this method is no more than another way of adjusting for confounding, and the use of propensity scores cannot convert an observational study into an RCT.

One way of increasing the rigor of appraisal of evidence in guidelines is the adoption of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system for grading evidence, now used by both NICE and the RA CPGs. The GRADE approach provides a system for rating quality of evidence and strength of recommendations that is explicit, comprehensive, transparent, and pragmatic and is increasingly being adopted by organizations worldwide (14). The GRADE system both ensures consistency and captures the difference between an assessment of the likelihood of an outcome and the confidence in that assessment. A well-conducted RCT may provide high-quality evidence of the likelihood of an outcome, but we may recognize that the usefulness of that outcome is limited and choose to make a weak recommendation on the basis of this strong evidence. That is, high-quality evidence does not necessarily mandate a strong recommendation, and, conversely, strong recommendations can arise from less than high-quality evidence. A beautiful article in the *British Medical Journal* reminded us that there has never been an RCT of the use

of a fabric device strapped to the back to prevent trauma from a gravitational insult (15). Nevertheless, all of us would still have confidence in a strong recommendation to use a parachute when jumping out of an aircraft, despite the weak evidence base underlying its use.

Another key area in guideline development is the workgroup composition. For a guideline to have any hope of being accepted and implemented, there needs to be representation from the key stakeholders, including all of the relevant clinical domains and, critically, patient representation. The workgroup must also include members who are skilled in the art of systematic and critical appraisal of the evidence presented. For example, the guideline development group from the NICE anemia management guideline included patients, all members of the renal multidisciplinary team (including pharmacists and anemia nurse specialists), general physicians, primary care, public health, hematology, diabetology, and also, critically, the technical team responsible for searching and appraising the evidence and performing health economics assessments (16).

Editorial independence is another key area that has quite rightly received much publicity (17–20). The guideline must be editorially independent from the funding body, and there should be no industry influence. When conflicts of interest of guideline development members are present, not only should these be recorded, but also a view should be taken on whether these conflicts may preclude participation in guideline development. There must also be a peer review process. The guideline should be externally reviewed by experts before publication; this should also include feedback by representatives of patient organizations, and this feedback should be actively sought.

So how do NICE and the RA CPGs perform according to AGREE criteria? Neither is perfect (Table 2). Key deficiencies include areas of the scope and purpose and stakeholder involvement in the RA CPGs, although one of the strengths of the RA CPG is its ability to pilot recommendations among end users, which is a deficiency of NICE. The RA does not have the resource behind it to apply the necessary level of rigor in searching for and appraising the evidence, but it does seek to harmonize recommendations with other guideline development groups and, in particular, to use the syntheses of evidence produced by KDIGO rather than attempt to reproduce this work. NICE actively seeks peer review from all stakeholders. Although both groups have a procedure for updating the guideline, this is time-limited in the case of NICE but an area of strength in the RA CPGs, where recommendations are updated as soon as important new evidence that affects recommendations becomes available. Neither guideline discusses the potential organizational barriers in applying the recommendations, but one of the potential strengths of NICE is the cost–benefit analysis, which again the RA does not have the necessary resource to effect.

Guideline Implementation

Implementation, or the processes for use, of guidelines is something that guideline developers either do not consider at all or consider too late in the guideline development process. In other words, the guideline is written and published, both in paper and electronically, and then mail-shotted but with no further interaction. This is fine for those who want to be aware or are already aware but not for those who are at best apathetic and at worst disinterested or actively opposed. These folk need to be brought into the process at the time of development of the guideline scope. The importance of identifying all those who may be affected by or who may influence the desired changes in practice cannot be emphasized enough.

Implementation, or use, requires a specified set of activities designed to put guidance into practice. Systematic reviews of factors that influence implementation of guidelines suggest that there is no single model for effective implementation (21–23); however, to be effective, implementation initiatives need to be integrated into routine organizational activity. There also needs to be a strategy for overcoming barriers, and there are clearly more barriers than merely lack of awareness (24,25). Which strategy or combination of strategies we use is going to be determined by what it is we want to achieve (Table 3). Successful implementation and overcoming the barriers are all about raising awareness and planning change. Reliable implementation of evidence-based care can seldom be achieved by a top-down "spray and pray" approach but requires a bottom-up approach that allows clinical staff at the "front line," or "microsystem," to do small cycle tests of change to work out how best to integrate the new way of working into their existing work patterns, followed by a program of spread to other microsystems. Generally, implementation of guidelines nationally requires adoption and acceptance of guidelines locally. In the United Kingdom, we have principles for local organizations to follow to implement NICE guidance, which would be familiar

Table 2. AGREE or Disagree? NICE and RA CPG compliance

AGREE Criteria	NICE	RA
Scope and purpose	+++	+−−
Stakeholder involvement	+++−	++−−
Rigor of development	+++++++	++++−−−
Clarity and presentation	++++	++++
Applicability	++−−	+−−
Editorial independence	++	++
Totals	20/23	14/23

Pluses indicate compliance, and minuses indicate noncompliance.

Table 3. Barriers and strategies for overcoming barriers to implementation

Barriers	Strategies for Overcoming Barriers
Motivation	Educational materials
Awareness and knowledge	Care pathways
Acceptance and beliefs	Meetings
Skills	Clinical audit and feedback
Practicalities	Outreach visits (academic detailing)
	Patient-mediated strategies
	Reminder systems
	Opinion leaders

to anybody trying to effect change, encompassing organizational support, clinical leadership, a team approach, and evaluation and feedback (26). We also have a process that starts by considering the relevance of guidance to our practice. If the guidance is relevant, then a clinical lead and multidisciplinary team are identified to carry out a baseline assessment of our compliance with guidance. A gap analysis and an assessment of how much it will take to become compliant with guidance is made, and an action plan is developed, implemented, and disseminated. Critically, the process must continue with subsequent review and monitoring not only to ensure continued compliance with guidance but also to update and improve on existing guidance.

As local organizations implementing guidelines, we have moved from just thinking about following guidelines to implementing guidance as part of an integrated care strategy, but we can do more than this. If we think about implementation early in guideline development and put in place key processes to aid implementation before we even try to implement CPGs, then we have a much greater chance of success. In the United Kingdom, we are fortunate to have a publicly funded health care system that enables us not only to create a structured delivery of health care for people with kidney disease across the whole pathway but also to introduce related initiatives simultaneously throughout the system. We are even more fortunate in kidney disease to be an area with a National Service Framework (NSF). NSFs are long-term government strategies for improving specific areas of care. The English Renal NSF was published in two parts (27,28). Part 2 (published in February 2005) was concerned with promoting identification of kidney disease and paved the way for national GFR reporting. This was introduced in April 2006, together with the introduction of renal indicators in the primary care quality and outcomes framework (QOF). The QOF is a quality incentive program for all primary care practices in the United Kingdom (29). It has defined domains of care and identified items of good practice that are measured annually and financially rewarded. The introduction of GFR reporting and incentivized renal indicators in the QOF paved the way for identification and referral of patients with CKD, implementing the generic referral recommendations from the NICE CKD guideline, which also appeared in very similar form in the RA practice guidelines and in the SIGN guidance (3).

These national processes have a very easily identifiable impact on local implementation, illustrated by the change in referral practice in one area of the United Kingdom (Figure 3).

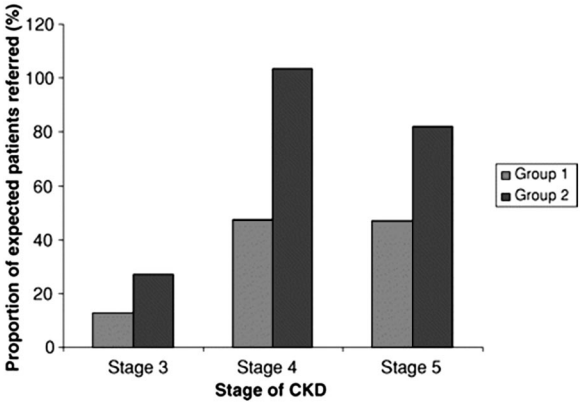

Figure 3. Number of patients referred from primary to secondary care for investigation of kidney disease between April 1, 2004, and March 31, 2008, in Kent, United Kingdom. This is expressed as a proportion of expected prevalence by stage of CKD. Group 1, April 1, 2004, through March 31, 2006; group 2: April 1, 2006, through March 31, 2008. Reprinted from reference (30), with permission.

The key aspect here is the increased referral of people with more advanced kidney disease, potentially reducing the numbers of those referred late to renal services (30). Data from the UK Renal Registry (UKRR) suggest that this may have translated into a national reduction in late presentation for dialysis, falling to 21% in the latest report (31).

Role of the UKRR in Guideline Implementation

One of the huge strengths of our UKRR is the quarterly electronic transfer of data, which lends itself to implementation of CPGs, particularly in ESRD. This, too, has had a helping hand from national initiatives. Part 1 of the renal NSF was chiefly concerned with ESRD, and it included a requirement for all centers to participate in national comparative audit and bench marking by submitting data to the UKRR. The registry now has 100% coverage of all centers in the United Kingdom, and we have already gone through the stages of facing reality so elegantly described by Berwick (32). In particular, with the de-anonymization of centers that present data to the registry, we have had no choice but to accept the burden of improvement. We still have a problem, though. We know that by

shifting the population mean, or reducing the SD, of specific clinical measures, we can potentially reduce mortality. We also know that there is no shortage of problems, that we have plenty of audit standards to measure, and that there are plenty of things we can measure that potentially have an impact on mortality. Our problem is that there is very little evidence of implementation of change in the systems of health care delivery, which in turn means that they continue to deliver the same results. Using registry data, we can show very nicely that, for example, urea reduction ratios of the dialysis population as a whole have improved (Figure 4), but when we look at individual center performance, although there has been improvement overall, actual center performance is a very stable characteristic; the same centers retain the same relative position in the "league table" for a particular measure from one year to the next. What is missing is the quality improvement and the dissemination of good practice from highly performing units.

The current RA CPG standard recommends that serum phosphate concentration (blood level) be between 1.1 and 1.8 mmol/L. The 2008 Annual Report of the UKRR noted that the standard was met in only 53% of hemodialysis patients and 64% of peritoneal dialysis patients (31). The UKRR has consistently demonstrated between-center variation in achievement of audit measures for bone and mineral parameters, but little is understood about the causes of this "center effect." Understanding the basis of this between-center variation, with a process of active learning from high performance, is necessary to drive improvement. To achieve this, we must first understand exactly what it is about those better performing centers that makes them so good and what it is about their systems of organizing and delivering treatment that makes them the best. To do that requires a qualitative assessment to identify candidate practice patterns, followed by quantitative assessment to find out which practice patterns are associated with the best outcomes. A good example of this put into practice comes from studies that examined door-to-balloon times in cardiology. Bradley *et al.* (33,34) first conducted a qualitative study using in-depth interviews of hospital staff at the 11 best performing hospitals—those with median door-to-balloon times of <90 min for their most recent 50 percutaneous coronary intervention cases through December 2002 and the greatest improvement in median door-to-balloon times during the preceding 4-yr period 1999 to 2002. Several critical innovations were described, and of 28 candidate practices, they then went on to identify the six practices that were significantly and independently associated with a faster door-to-balloon time. Adoption of these six practices would be much more likely to accelerate improvement in door-to-balloon time than a program of reminders, regular audits, workshops, *etc.* The next step for us in the United Kingdom, then—and this is work in progress—is to close the gaps between recommended performance from CPGs and actual observed practice in individual units and in doing so also close the gaps between high-performing and low-performing units. The UKRR aims to do this by supporting renal centers in quality improvement methods in the implementation of change packages derived from the registry's understanding of the causes of between-center variation. Achieving detailed understanding of the causes of the center effect for any given measure of clinical performance is time-consuming and methodologically complex, requiring multilevel modeling to account for case mix, but is clearly necessary if we are to achieve whole-scale transformation and a narrowing of the gap between worst and best performance.

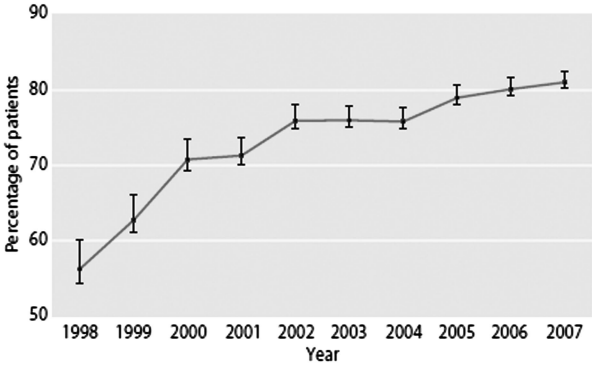

Figure 4. Change in the percentage of patients with urea reduction ratio >65% between 1998 and 2007 in England, Wales, and Scotland (31).

Where Do We Go from Here?

The Johns Hopkins evidence into practice model describes a process that encompasses summarizing the evidence, identifying local barriers to implementation, measuring performance, and ensuring that the intervention or recommended standard is implemented for all patients (35). Achieving the last part involves a cycle of engagement, education, execution, and evaluation—very similar to the process described in the NICE implementation guidance. The processes are robust, but use and implementation of guidelines must begin with engagement of the key stakeholders at the stage of development of the guideline scope. Implementation and use should then be integrated with each stage of the guideline process and critically into routine organizational activity—encompassing all levels of the organization(s) involved. No single approach to implementation is superior, but strategies and change interventions are effective when targeted and focused for the expected change and setting. As Berwick (32) stated, "Quality is a system property; if we want better results, we have to change the system."

Disclosures

None.

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