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Guidance on Guidelines: Understanding the Evidence on the Uptake of Healthcare Guidelines

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Abstract

Rationale

Regardless of health issue, health sector, patient condition or treatment modality, the chances are that provision is supported by 'a guideline' making professionally-endorsed recommendations on best practice. Against this background, research has proliferated seeking to evaluate how effectively such guidance is followed. These investigations paint a gloomy picture with many a guideline prompting lip-service, inattention and even opposition. This predicament has prompted a further literature on how to improve the uptake of guidelines and this paper considers how to draw together lessons from these inquiries.

Methods

This huge body of material presents a considerable challenge for research synthesis and this paper produces a critical, methodological comparison of two types of review attempting to meet that task. Firstly, it provides an overview of the current orthodoxy, namely 'thematic reviews', which aggregate and enumerate the *barriers and facilitators* to guideline implementation. It then outlines a 'realist synthesis', focussing on testing the *programme theories* that practitioners have devised to improve guideline uptake.

Results

Thematic reviews aim to provide a definitive, comprehensive catalogue of the facilitators and barriers to guideline implementation. As such they present a restatement of the underlying problems rather than an improvement strategy. The realist approach assumes that the incorporation of any guideline into current practice will produce unintended system strains as different stakeholders wrestle over responsibilities. These distortions will prompt supplementary revisions to guidelines, which in turn beget further strains. Realist reviews follow this dynamic understanding of organisational change.

Conclusions

Healthcare decision makers operate in systems that are awash with guidelines. But guidelines only have paper authority. Managers do not need a checklist of their pros and cons, because the fate of guidelines depends on their reception rather than their production. They do need decision support on how to engineer and re-engineer guidelines so they dovetail with evolving systems of healthcare delivery.

Introduction: the guidelines industry

Guidelines are ubiquitous in healthcare; there are guidelines for every condition from abdominal pain to zoster virus. There are guidelines for all sectors: clinical practice guidelines, public health guidelines, technology appraisal guidelines, self-care guidelines. There are guidelines for every point in the patient pathway: diagnosis, screening, referral, treatment, withdrawal-from-treatment. Production takes place at every level from cottage industry (e.g. guidelines for local practices and emergency teams) to national function (e.g. guidelines issued by Royal Colleges and National Institutes) to global enterprise (e.g. guidelines from WHO taskforces). The delivery formats are diverse, covering everything from the one-page poster to hundred-page manuals and, latterly, to e-guidelines. Guidelines are so pivotal that they are now under constant formal pressure to meet agreed quality standards for their development and dissemination [1,2].

Whilst the production of guidelines is seemingly relentless, it turns out that guideline 'compliance' by practitioners on the ground is varied; many would say suboptimal [3-5]. The associated misgiving is that the evidence base, of which the guidance is supposedly the repository, may not be used to the full. The response from the research community to this has been immediate and prolific. Many hundreds of studies have amassed assessing guideline 'X' in order to discover the extent of compliance by practitioners and the reasons why the advice is and is not followed. Investigation on this scale results inevitably in the need for synthesis and so the primary research is rapidly followed by systematic reviews of guidelines from 'A to Z' - trying to understand, in broader terms, what works in guideline production and to unearth the all-pervasive facilitators and impediments to their implementation. This brings us to the methodological issue for the paper. How should such reviews be conducted so as to offer practical advice – for both the intended recipients of guidelines (for example,

practitioners) and those with an interest in whether they are followed (for example, managers, commissioner and policy makers)?

Approaches to review

Traditional systematic reviews in the Cochrane tradition have revealed considerable variation in the extent to which stakeholders follow guidelines [6,7]. Attention has now turned to understanding why such variation exists and to explain why some guidelines are followed and others are not. We compare and contrast two models of review as applied to these questions. Firstly, we offer an overview of the mainstream method in this area – reviews that conceptualise the challenge of increasing the uptake of clinical guidelines as one of overcoming 'barriers' and providing 'facilitators' [8,9]. We then go on to detail some work which considers that healthcare guidelines are always inserted into complex adaptive systems [10-13], where both 'barriers' and 'facilitators' interlock in intricate and convoluted ways. We then trace the challenges this creates in the system using the method of realist synthesis [14] and here we call on some material from a realist review [15].

Approach one: Thematic reviews – facilitators and barriers to guidelines

The approach to research review considered here, which is sometimes characterised as a 'thematic' or 'narrative' perspective, can be considered the orthodox approach to research synthesis in the particular domain of guideline investigation. This approach to review seems particularly apposite because it builds directly on the raw materials available in the primary literature. Much of the basic research, on which such reviews are built, operates in the self-styled 'barriers and facilitators' approach. It may be summarised as follows: a particular guideline is chosen for investigation as is a selected set of its intended users, most often practitioners. They are then faced with a broad set of questions on their familiarly with,

experience of, attitude toward, and confidence in the said guideline. These responses are then subjected to thematic analysis.

The primary analysis is usually presented in the form of a framework or typology. If surmounted the extracted themes become 'facilitators'; if they present a stumbling block to implementation they became 'barriers'. Although they have this common origin the ensuing frameworks vary greatly in the pattern of types and sub-types derived in the analysis. We present a brief synopsis from four characteristic studies in table 1 [16-19]. We have no space here to describe the eventuating themes in any detail – hopefully their meaning will be reasonably self-evident from the chosen labels. In the original studies the meaning, distinguishing features and rationale for each type is elucidated in greater depth. Illustrative quotations are provided in the exposition of each theme. In respect of a widely cited theme on the need for 'clarity' in guideline presentation a GP reports: 'a complicated piece of paper, it's no use to me. I'm a simple man and I need to have simple ideas' [18]. On the idea that 'patient pressure' is a barrier, which may encourage the physician to ignore guidelines, another GP explains that radiography referrals for back pain are in high demand as a source of 'illness legitimation'. 'The patient can come home and say, "I had an X-ray" and then everybody will realise I have a pain in my back' [16]. Because they represent the daily struggles of actual users, these primary studies present rich practical insight of fortunes and foibles of guideline implementation.

Table 1 about here [16-19]

Here then are the bountiful raw materials for the thematic review, one that will go on to compile, reconcile and synthesise the fragmentary, local depictions of barriers and facilitators. There have been a number of such reviews from 1999 [20] to 2015 [21]. Here we provide an account of two of the most influential thematic reviews attempting to synthesis the

entire barriers and facilitators literature in relation to guideline use [8,9]. The research strategy is complex; it is a cross between a systematic review (scoping and definitional work, searching for studies, quality appraising, extracting findings) *and* a thematic analysis (to be precise a secondary thematic analysis of the various primary thematic analyses). The essential aim is to provide a master or meta-framework or hierarchical explanatory narrative that captures and combines all existing frameworks. Cochrane et al call them 'barrier groupings' (Table 2) [9]. Gagliardi et al. call it a 'final conceptual framework' (Table 3)[8]. Table 2 contains some additional information on 'frequency', that is the number of times a particular theme has been discovered in the primary literature. Table 3 provides a different set of themes and subthemes but also includes a useful third column providing brief examples explaining the coverage of each theme.

Table 2 about here [9]
Table 3 about here [8]

What is evident when comparing these meta-frameworks is that although there are similarities between them, there are also significant differences. The results from other reviews in the barriers/facilitators tradition also offer no definitive framework. If we are looking for practical guidance, how should one chose between frameworks?

There is, of course a large methodological literature on frameworks, classification systems, typologies, taxonomies, and so forth [22]. And within this there is the classic discussion on the different types of 'validity' – 'face', 'content', 'criterion', 'construct' and so forth. All of the frameworks under discussion (primary and secondary) have evident face validity. They originate in the lived experience of guideline users - so that notion is no help in deciding between them. Most methodological authorities place faith in 'construct validity';

namely, that the worth of a measure is the degree to which it measures what it claims to measure. If one tests a theory using a particular measure and that theory is corroborated then this also adds validity to the measure. A measure becomes validated over time – the more theories it supports and the more those theories are successful, the stronger the faith in the measure: 'The best construct is the one around which we can build the greatest number of inferences, in the most direct fashion' [23].

If one follows this advice (and we do) this allocates the assessment of the validity of any guidance framework to the utility of the model rather than the construction of the model. And this returns us to the central question of the paper – how are users supposed to apply all of this evidence on guideline effectiveness? We begin by considering the expectations on this score of one our review teams. In the second half of Gagliardi et al's paper there is a 'test' of 20 existing specialist guidelines to see if they fit with the 'extended model' emerging from their typological review. Results are disappointing. The various guidelines under scrutiny are adequate in terms of presenting 'graded evidence' but few examples contained 'additional features that could improve guideline usage' [8]. In short, most existing guidelines fare much better in their coverage of items in the upper sections of Table 3.

A curiously limited notion of guideline validity is implied in this test. What the Gagliardi review seeks to inform is the business of guideline *construction*. The evidence on why potential users of guidelines follow or fail to follow them is returned on itself in order to improve the presentation and content of guidelines. A comprehensive, master framework is devised in the expectation that future guidelines should conform to that rubric. A grammatical shift from noun to adjective is introduced to establish this goal – guidelines vary in their 'implementabilty' and this evidence-endorsed template will help to get their content right.

The guideline industry is certainly promulgated and perhaps regulated as a result of such frameworks. Powerful collaborations have gathered promoting these 'international tools for the rating and assessment of practice guidelines' such as the AGREE template (www.agreetrust.org/).

But all this is indeed a curious interpretation of construct validity and guideline utility because the main empirical lesson from the 'barriers and facilitators' investigations is that guidelines only have paper authority. The reason why guidelines fail is little to do with their content and format (their implementabilty) but mostly due to complex decision structures in which they are embedded (their implementation). However perfect their presentation, however comprehensive their coverage, however true to template, there is no reason to suppose that guidelines will be followed. This is the lesson that emerges from all empirical studies. What matters is the reception that awaits guidance when it has left the page and enters the clinic.

This brings us to a second and perhaps more commonplace expectation about how the thematic analysis on guideline effectiveness might be put to use. In this version, also evident in more recent endeavours [21], the review is said to provide an authoritative checklist of barriers/facilitators to guideline implementation in expectation that it presents a 'to do' list for policy-makers, managers and practitioners. The role of barrier and facilitator reviews, on this view, is to provide strategic overviews; they are the design tools itemizing what is required in a comprehensive planning process. On this view, it is up to decision makers to promote the deeds to ensure that the words of guidance are followed and, accordingly, the test of research utilisation is changed – can it be said that barrier and facilitator classifications are an effective planning tool?

This checklist perspective has come in for its fair share of criticism, most notably in an article with a telling title: *Is the metaphor of 'barriers to change' useful in understanding implementation?* [24] This paper takes us back to the raw materials similar to those noted in many of the primary studies on guidelines. Prompted by questions about why guidance might be ignored, a GP in this study replies: 'But if anybody thinks that things arrive here, somebody has the time to look at it and then spread it as useful information that everybody else thinks sensibly about, they've got another thing coming'. Now 'removing' this barrier to change is usually discussed in terms of simplifying guideline presentation, providing guideline summaries, improving the channelling of recommendations and so on, in order to make the guidelines easier to access and understand. The authors, however, submit the rival interpretation that the 'time pressure barrier' is simply an underlying organisational reality and that source of the problem and its solution may lay there [24].

The point made here is that barriers are not something to be ticked off and torn down one at a time. What the 'barriers' primary studies are actually describing are personal, social and institutional *interrelationships*. Barriers interlock because a change in one part of a complex system will always trigger change in another and then another [13]. This suggests a rather different role for reviews of guideline uptake and compliance. What the synthesis should be studying and explaining is why some barriers are more intractable than others and why solutions always have emergent effects. Solving barrier A might exacerbate barrier B, solving barrier C might create unintended consequence D, introducing facilitator E might be crushed by impediment F. We rather suppose that practitioners in the real world are faced with multiple and often competing system strains when contemplating the use of guidelines

and suggest that for reviews to be of practical use they need to capture this complexity. We turn next to a review attempting to decipher these interconnections.

Approach Two: Complex adaptive systems and realist, programme theory approaches

We devote the remainder of the paper to illustrating the potential of an alternative method for reviewing the primary research on guideline use and adherence in clinical practice. Realist synthesis promotes an explanatory role for systematic review and seeks to explain *why* an intervention might work (or flounder) and to uncover the many contingencies that generate success (or failure) [25]. The approach assumes heterogeneity in the implementation of and response to any intervention and seeks transferable lessons by focussing the review on 'programme theories' which are common to all. Programme theories represent the ideas and assumptions underlying how and why an intervention is expected to work. A wider range of evidence may be drawn into the review, explored in a research design which extract, formalise and test the programme theories that lie beneath interventions. We concentrate this account entirely on the analytic structure, with the idea of using a review to explore programme theory. Further methodological details of other features of realist synthesis may be found in elsewhere [14,26].

So what are the relevant programme theories that might underpin efforts to increase the utilisation of healthcare guidelines? We take a fresh point of departure drawn from complexity theory as it has been applied to understanding organisational change [11,27,28]. All healthcare organisations consist of different divisions, sections and departments. Each of these separate units deal with specialist tasks but for these functions to be fulfilled requires the sharing and harmonisation of goals. Healthcare organisations are also made up by staff and professional groups working in them as well as the people being served by them, each with their own aspirations and goals. Moreover, all healthcare organisations are located in a web of managerial, funding and political relations, which shape the provision on offer.

Together this medley of functions, competences, mental models and institutional constraints generate what Zimmerman et al (2012) call 'structural complexity' [29]. Tensions, conflicts and turbulence can exist between these various layers, especially during innovation such as with the introduction of guidelines.

The fate of any reform thus depends on its reception across all of these fronts. An intervention aimed at a particular function will reverberate across the whole system. Innovation is always accompanied by unpredictability and unintended consequences, by positive and negative feedback loops. On this model, whether by primary evaluation or systemic review, it is the task of research to trace and explain such emergent effects.

The realist approach attempts to capture this dynamic using the idea that programme theories are under constant revision, in response to experience of implementing the intervention on the ground. A problem in healthcare delivery is recognised, an idea is devised that might deal with it, which is realised in a particular intervention, the intervention makes some headway but is thwarted at different points in the system, these strains generate further ideas to resolve them, they too are embodied in a revised programme, which makes partial progress but comes under new strains. And so the process continues. This style of management and policy making, uncharitably known as 'muddling through' [30], is exactly how interventions unfold.

This then is the overall framework that we applied in our review of the uptake of guidelines. Our mental image of the practitioner is not one of the master-planner, designing a guideline blueprint from scratch, rather it is of the manager or clinician coping with many existing guidance systems and attempting to integrate them into wider care regimes. Indeed, we recognise that managers and clinicians may have diverse responses to guidelines, due to their different roles within health care organisations and spheres of influence. Our strategy was to search the primary literature for evidence of the system strains that develop on the

introduction of guidelines, to follow the revisions in programme theory that ensue and to attempt to chart the relative effectiveness of each twist and turn. Thus, realist synthesis locates primary studies to explore the form and direction of this continual process of theory refinement, in order to understand in what circumstances and through what processes these system strains are resolved. Our aim here is not to offer the definitive answer as to why guidelines are or are not followed but to illustrate some of the contradictions between the different ideas put forward to improve the uptake of guidelines and explore whether and how they might be resolved. Our analytic strategy, on which we concentrate here, began with the identification of major system strains that have routinely occurred with the inception of guidelines and then went on to locate the evidence on the manner and the extent to which they could be overcome. Major dilemmas that confront guideline use include:

1. The tension in using the simple guidelines for complex comorbidity.
2. The tension between (inter)national credibility of and local control over guidelines
3. The tension between patient choice and top-down guidelines.
4. The tension resulting from guideline oversupply – a new guideline can swamp routine systems.

We recognise that these are not definitive but are confident that they will be familiar to both managers and practitioners. What follows are some indicative data from the full review [15]; here we cover only the first two tensions and we extract only a few key findings in order to discuss their implications.

System Strain 1: Simple Guidelines versus Co-morbid Patients

A recurrent idea in all the aforementioned research is that guidelines are more likely to be implemented if the presentational format is straightforward, intelligible, comprehensible, uncomplicated and so on. The beginnings of a system strain emerge when through the surgery door walks patient X whose ills are far from uncomplicated. Several

studies have explored the problems of 'fitting' the patient to the guideline when that patient has co-morbidities and, more especially, if that patient happens to be frail or elderly [31,32]. These studies exhibit the constant adjustment of programme theories that we elucidated earlier.

We began our review by searching for background material that exemplified and charted this system strain. We identified a number of studies that examined the texts of existing guidelines within a clinical domain and assessed the extent to which they dealt with co-morbidity. Several of these studies have found that guidelines for a range of chronic conditions 'inconsistently' at best and 'rarely' at worst provided treatment recommendations for patients with multiple co-morbidities [33-38]. The quotations below illustrate the typical findings of these studies:

'Half the guidelines addressed treatment for older patients or for patients with one comorbid condition. But only one addressed treatment for older patients with comorbid conditions' [38].

'Of the 20 guidelines, 17 (85%) addressed the issue of comorbidity and 14 (70%) provided specific recommendations on comorbidity. In general, the guidelines included few recommendations on patients with comorbidity (mean 3 recommendations per guideline). Of the 59 comorbidity-related recommendations provided, 46 (78%) addressed concordant comorbidities, 8 (14%) discordant comorbidities, and for 5 (8%) the type of comorbidity was not specified' [36].

Furthermore, one study found that the quality of the guidelines for dementia, as judged by an internationally agreed measurement of guideline quality, the AGREE tool, bore no relationship to the extent to which a guideline was relevant to older people with multi morbidity [33]. This suggests that current conceptualisations of guideline 'quality' do not

incorporate assessments of the external validity of such guidelines and their applicability to people with multiple co-morbid conditions.

A basic tension, that current guidelines do not adequately address co-morbidity, is thus recognised in the literature. Our synthesis then explored a number of proposed solutions to this problem to examine the extent to which they do, in fact, resolve this tension. We expressed these as different *adaptations* to the programme theory (simple guidelines are easier to follow) which attempt to incorporate advice on co-morbidity. We begin with the simplest adaptation, *theory 1a*, that one way of resolving the tension between the need for simple guidelines and the issue of co-morbidity is to increase the comorbid patient's exposure to multiple guidelines. Several studies cover the potential costs and unintended conflicts of following more than one guideline simultaneously. One study used treatment dispensing data to show that 16% of people with diabetes being treated for other conditions received medicine with adverse effects on diabetes [39]. In another study, a panel of experts identified the possible serious drug-drug interactions in NICE guidelines for heart failure, type 2 diabetes and depression in relation to guidelines for nine other potential co-morbid conditions and found 133 potential drug-drug interactions in the type 2 diabetes guidelines, 89 for depression and 111 for heart failure [40]. A further study mounted a simulation exercise on the consequences of following the explicit recommendations of two or more guidelines demonstrating a significant hike in the treatment burden, especially on self-care regimes in an elderly comorbid population ill equipped to meet such demands [35]. Another, earlier simulation study followed a hypothetical comorbid patient who, following all relevant guidelines, would be prescribed 12 medications at a cost of $406 per month, some with possible adverse effects [41]. This limited selection of the studies provides a fair indication of the fate of theory 1a - that expectations about the simultaneous use of multiple guidelines may exacerbate rather that solve the co-morbidity problem.

Lack of headway on this front leads, as ever, to more imaginative attempts to solve the impasse. We turn to the next adaptation, *theory 1b*, namely to increase attention to comorbidity *within* condition specific guidelines [36,37,42,43]. Here, the idea is that guidelines should provide information to enable clinicians to more effectively apply the guideline to patients with multi-morbidity; for example, by detailing the percentage of patients with co-morbid conditions included in the original trials and the extent to which co-morbid conditions may modify treatment effects. However, most clinical trials are designed to obtain estimates of the maximum possible treatment effect of a drug in a single disease, rather than maximise the trial's applicability to different groups of patients [44,45].

This creates a further strain which is unlikely to be resolved as the evidence base on which guidelines are built privileges clinical trials, from which patients with multiple morbidities are generally excluded [45-48]. For example, Boyd et al (2012) reviewed 161 trials on the Cochrane register evaluating drug and non-drug treatments for four common chronic conditions. They found that trials commonly excluded patients with co-morbidities; less than half of trials (43.5%) reported the prevalence of co-morbidities among participants with the index condition in their findings and only 3.1% of examined the extent to which co-morbidities were an effect modifier on the overall treatment effect [44]. Fried et al (2014) conducted a systematic review of studies that examined outcomes of treatment for an index condition, or the outcomes of different treatment intensities of an index condition in the presence or absence of co-morbidity. From 3252 potentially relevant papers, they identified only 45 studies which had conducted these analyses, with only one examining the effect of co-morbidity per se; most studies examined the effects of treating an index condition in the presence or absence of a single co-morbid condition [49]. This indicates that providing more detailed information on the relevance of the guidelines to patients with co-morbidities may stumble through a lack of such information. It also sends us full circle to the original

conundrum – addressing comorbidity within a guideline would inevitably increase the complexity of guidelines, which is already an established standard deterrent to their usage [50].

Even these simple 'nuggets of evidence' show that guidelines are constantly being made and remade under this system strain. A further recent refinement, *theory 1c*, to guideline logic suggests a shift from 'disease specific guidelines' to 'patient centred guidelines' [51-53]. To be more precise, such guidance intends to focus on subgroups, for example – 'decision making on care of the elderly with conditions X`, Y and Z'. Guidelines, under this theory, should focus much more on choosing and prioritising treatment and so in theory reduce the tension inherent in following multiple combinations of condition specific guidance. To work in practice, this theory rests on the idea that clinicians can take account of multiple patient factors in adjusting guideline recommendations to the patient in front of them. For example, Durso (2006) recommends that clinicians should 'Estimate the patient's approximate life expectancy compared to the median for individuals of that age-sex cohort by considering the presence or absence of unusually good or poor health and function' [53]. There is already a problem with physicians being bombarded with guidelines on X, Y, Z. If thanks to patient complexity these become subdivided into guideline X1, X2, Y1, Y2, Y3, Z1, Z2, with supplementary decision rules on navigating to the appropriate pathway, there is an obvious emergent further problem afoot in the realm of guidance fatigue [54].

This seemingly insurmountable system tension has led to the advocacy of so called 'real evidence based medicine', which we label here as Theory 1d. A key component of 'real evidence based medicine', is that health professionals, through discussion with patients, integrate guidelines with patient values and clinical judgement to deliver personalised care to individual patients [55-57]. There is some evidence to suggest that this is how GPs on the ground operate when faced with clinical guidelines that fail to address multi-morbidity. For

example, qualitative studies of GPs' management of patients with muti-morbidity indicate they rely on their clinical judgement or 'common sense' in the face of clinical guidelines and adapted and prioritised their management of patients problems in response to patients' values and preferences [32,58-60]. However, in a context where the expectation is that guidelines should be followed as best practice, clinicians expressed some reservations about relying on one's common sense because it 'was not considered acceptable anymore' [59].

Thus, we complete our journey through this highly emergent and intractable system strain by concluding that clinician judgement and discretion are essential to patient care and thus also need to be understood in future advice on the implementation of guidelines. The evidence tells us that the tension between the need for simplicity in guidelines and the problem of multi-morbidity cannot be resolved. Perhaps, therefore, what is required is a reframing of the issue from one of a 'lack of compliance' to 'considered and rational rejection' of guidelines in specific situations, such as patients with multi-moribidity. This conjecture, of course, requires further testing and analysis.

System Strain 2: The tension between (inter)national credibility and local control over guidelines

We now turn to our second system strain and again we chart the iterative process of theory refinement using a realist approach. As noted in Tables 1 and 2, the 'credibility' of guidelines is often cited as a key facilitator in influencing their uptake. Credibility, however, may be nurtured in quite different quarters and we use the review to uncover and test out a variety of programme theories attempting to decipher the key axis of credibility. As previously, we encounter a range of competing ideas (labelled 2a, 2b, 2c, etc) and we assess the available evidence that has accrued in support of each.

One assumption, *theory 2*a, begins with the notion that guideline development requires major clinical expertise and methodological resources. Accordingly, guidelines endorsed by national or global professional organisations are seen as more trustworthy and are, in turn, more likely to be implemented (e.g. *The Royal College of Physicians National Clinical Guideline for Stroke*). However, nationally developed guidelines may lack applicability and relevance to local contextual factors. A rival contention, *theory 2b*, posits that involving local practitioners is the key source of credibility because the guidance will include intelligence on the prevalence of the condition in the local community, the local availability of services and resources, and on current inter and intra organisational relationships (e.g. *Oxfordshire Regional Genetics Service Referral Guidelines*).

Here we have the beginnings of a classic system strain, sometimes termed the 'glocalism' paradox. To address this tension, *theory 2c*, the local adaptation of nationally developed guidelines has been widely advocated as a potential solution. This proposition seeks a 'best of both worlds' solution and considerable resources have been expended in pursuing it. The best known of these initiatives is the international ADAPTE collaboration (www.adapte.org). Under this regime, the task of 'customising' a guideline so that the global becomes the local is itself a feat of organisation. Decisions need to be made about topics, organizing committees, source documentation, consultation rules, format and promotion. The ADAPTE process has a whole series of phases and modules, numbering 24 steps in all [61]. At the other end of the scale, adaptation can be ad hoc, locally initiated and focussed on particular units with identifiable users [62].

Whilst all this is proof positive for our thesis that reviewers of the guidelines literature must anticipate a moving target, it opens up another system tension in need of explanatory synthesis. How does the evidence stack up in relation to theory 2c – does the local adaptation of guidelines make their content more relevant to local users and thus increase their use?

There is copious material comparing guideline content before and after adaptation. Some of this considers the extent to which adapted guidelines can be of the same standard as those with a national pedigree. Rowe, for instance, suggests that locally developed guidelines are poor in coverage according to AGREE standards [63]. By contrast, other inquiries suggest that the process of local adaptation does not seriously distort the clinical validity of the original guideline [64]. Further studies have attempted to adjudicate this debate and seek to unearth subtle, qualitative differences between the national and local instruments. Sometimes, the adapted guidelines have almost identical coverage and content as the originals [65]. Yet other research notes the adaptations are significant: specialising in topics with local priorities [64], having shorter and more accessible formats [64,66,67], and perhaps most significantly, providing additional information on the availability of local services and thresholds for referral [66]. In terms of *guideline content*, it is probably fair to say that the jury is still out on whether the local adaptation of national guidelines makes for significant change. Much depends on the condition under scrutiny and the motivation of the 'translators'.

Another relevant body of evidence here, usually in the guise of 'process evaluations', comes from studies which trace the practical steps and resources involved in guideline adaptation. Sometimes guidelines are adapted through a series of short workshops or meetings with local primary and secondary care clinicians [64-67]. For example, one study reports on a process that took two months from initiation to completion [62]. Another study reports a case where the adaptation was undertaken through twelve hours of group discussion [67]. By contrast, other studies have followed the processes involved using formal templates, such as ADAPTE described above, which attempt to standardise the process of guideline adaptation [68,69]. Key evidence emerging here suggests that full-blown formal adaptation is a resource intensive and costly business – involving a need to revisit the original evidence, identifying additional research evidence to support local content, and providing

methodological support to critically appraise the final product [70] Process studies, in summary, reveal no clear pathway to adaptation; revisions may constitute a molehill or a mountain according to the responsible body. The merits of theory 2c remain unclear.

The research reviewed thus far, extensive as it is, takes us no further than 'paper guidelines' and we have already had cause to question that authority. The major issue lurking within the 'glocalism' paradox is, of course, whether locally adapted guidelines improve uptake. Do users pay more attention to and act upon guidelines that have been locally adapted? Yet another outcrop of studies tackles this problem and we begin a mini-review by noting a considerable methodological difficulty. The basic design involves manipulating a situation whereby identical groups of practitioners are exposed to existing and to adapted versions of the guidelines and then observing differences in their understanding and action. Much of the primary literature teaches us that achieving this clean difference will be demanding because the actuality of 'exposure' to a guideline is so diverse. For illustration, we examine findings from two such studies.

Firstly, we review a cluster trial on guidelines for Stroke Prevention and on Urinary Tract Symptoms [65]. Nationally and locally designed guidelines were allocated randomly to two divisions of General Practice in Adelaide. The local guidance included additional information regarding availability of divisional resources and was presented with more 'user-friendly' design and formatting. Dissemination, identical for both versions, included mailing shots, newsletter articles, prompt sheets, educational workshops and web-links. Considerable change in GP's usage of guidance was noted – observable, however, in both arms of the trail. The authors conclude: 'Whilst the study found significant changes in knowledge, attitudes and reported practice as a result of disseminating guidelines, it did not find any additional effect from the local adaptation process. This suggests that the emphasis and investment in

promoting guideline implementation should be placed on multifaceted dissemination strategies rather than local adaptation per se' [65].

A pioneering French study also throws light on the mechanisms through which guideline adaptation may work [62]. The background here was the perceived overuse of pre-operative tests for anaesthetic risk. National guidelines had shown that they were costly, had highly restrictive diagnostic use and did not add significantly to the safety of operations. The team thus undertook a process of local adaptation of these guidelines at the hospital level (15 surgical wards). The organisational structures responsible for ordering the tests were mapped and team discussions of the new recommendations were set up. Before and after measures were taken of referrals for such preoperative tests and in the targeted low-risk groups requests fell from 80% to 48%. The question of attribution raises its head; we lack a control group here and simply cannot say that the adapted guideline bore responsibility for the change. The French team draw a different, system-based lesson. The people responsible for adapting the guidelines are the same people who organise the implementation of the new guidelines: 'We think that the main contribution of this work is linking of the process of local adaptation to an analysis of the organisational aspects of the practice and the emphasis we placed on the organisational aspects of change' [62].

Many other studies of the impact of local adaptation have followed [67,71] but the two studies above provide indication of the direction of travel. Whether guideline content is *de novo* or *de integro* seems to be far less crucial than its passage from the text to consulting room, through the conversations between its users, and onto the organisational adaptation involved in its usage. In contrast to system strain 1, here we see that theory revision is progressive and learning accumulates; over time and with considerable ingenuity this strain has proved more tractable. The take-home messages seem to be:

- *Theory 2d* – Adapt guidelines to kindle interest rather than to impart new knowledge.

- *Theory 2e* – The more local the adaptation the greater the number of interested parties who will be drawn directly into implementing and acquiescing with the scheme – thus increasing the chances of them being followed.

Conclusion

Further details on attempts to resolve other system strains may be found in the full-scale review [15]. Here we attempt to draw together the key implications of the above analysis, which we separate into three comments – substantive, methodological and procedural.

1. Given the tumultuous increase in usage, guidelines should be regarded as part of the fabric of service delivery rather than as separate interventions with unique objectives. When a new guideline is introduced, or when an old one is updated, it will sit alongside a range of other organisational controls, rules, norms, customs, practices, targets *and* guidelines. Guidelines will always be constituent part of a system of governance and their destiny rests on how well they are absorbed into that system.

2. There has been an equally tumultuous increase in the research on guidelines and it is important to find the appropriate means of synthesising the burgeoning evidence. We have demonstrated the limitations of trying to seek a master framework listing all of the factors on which success depends. There are scores of barriers and facilitators that help and hinder guideline implementation but these do not resolve into some sort of winning formula because the factors identified are always interdependent. Dealing with barrier A will always have effects, anticipated and unanticipated, on enabler B, and so on. This interconnectivity does not leave systematic review with the task of describing unending, unforeseeable change. History does repeat itself and a raft of discernible system strains can be detected as guidelines are introduced. System change does have a pattern and in the paper we have described a

method, realist review that is able to analyse how some of the more familiar strains evolve and resolve.

3. This brings us finally to the business of research utilisation. Evidence is supposed to inform policy and practice and this ambition necessitates a realistic understanding of the roles of the policy-maker, the manager and the practitioner. Our understanding, in this domain, is that the time has long passed for high arbitration about whether or not to have guidelines. Decision makers are already awash with guidelines and so they are not sitting, Pilate like, awaiting the definitive verdict about their effectiveness. We also presume that very few decision-makers work in splendid isolation and have the task of implementing an entire guideline system from scratch. They are replete with guidelines and they do not operate by ticking off ratified checklists about how they should be managed.

We do suppose that the key business is system improvement [72] so that patient care is optimised. Accordingly, the crucial task is to dovetail the constant flow of guidelines into an existing organisational structure. The really difficult activity is to engineer and re-engineer the latest manifestations so they work smoothly with the pre-existing system. Practitioners adjust guidelines to the system and the system to the guidelines. As noted, practitioners routinely go about such fine-tuning by a process that has come to be known as 'muddling through' [30]. And it is with this reflective process that research synthesis can be most helpful. Practitioners can learn by appreciating how their colleagues have struggled with similar tensions. If they have available evidence of the relative merits of existing alternatives to guideline incorporation, they have materials to help them 'think through' rather than 'muddle through'.

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Table 1: Typological Reviews: Four Accounts of Facilitators and Barriers to Guideline Implementation

Espeland and Baerheim (2003) [16]	Sheldon et al. (2004) [19]	Rashidian et al. (2008) [18]	Lugtenberg et al. (2009) [17]
Knowledge-related Lack of knowledge of the guideline **Attitude/feeling-related** Lack of agreement with the guideline: - lack of agreement with its decision criteria - lack of outcome expectancy - lack of process expectancy Lack of feelings expectancy Lack of self-efficacy Lack of motivation/inertia of previous practice **External** Guideline-related: unclear or impractical to use Patient-related pressure Setting-related: - lack of time - lack of other practice resources - increased costs - increased malpractice liability - external pressures in the health care system - improper access to health care services	**Characteristics of guidelines** Strong professional support Stable and convincing evidence base No increased or unfunded costs Good systems for tracking guidance Professionals involved are not isolated Guidance clear and reflects clinical context **Characteristics of recipients** Commitment to guidance Lead clinician identified to implement Proactive audit of costs of implementation Responsibility for implementation vested locally Strong clinical governance Culture of consensus Recognise legitimacy of provider Involvement of clinicians in guidelines Financial stability Expectation that compliance in mandatory Targeted audit of non-compliance.	**Theme I: credibility of content of clinical guideline** Evidence-based Flexible **Theme II: credibility of source of clinical guideline** National professional bodies National governmental bodies Published in respected sources **Theme III: presentation of clinical guidelines** Simple Systematic presentation **Theme IV: influential people in implementation** Presence of: Practice nurses / primary care team / primary care organisations / pharmacists /prescribing advisers **Theme V: organisational factors** Practice characteristics Information technology **Theme VI: disease characteristics** Rare or 'simple' disease **Theme VII: dissemination strategy** Ownership—local vs. national guideline Perceived need of first contact Enforced or supporting implementation	**Knowledge** Lack of knowledge Lack of awareness familiarity **Attitude** Lack of agreement with recommendation Lack of applicability Lack of outcome expectancy Lack of motivation (practice inertia) **Behaviour** *~ Patient factors* Patients' preferences / demands Patients' ability / behaviour *~ Guideline factors* Unclear / ambiguous Incomplete / not up to date Not easy to use / too complex *~ Environmental factors* Lack of time / time pressure Lack of resources / materials Organisational constraints Lack of reimbursement

Table 2: Cochrane et al's (2007) [9] 'Barrier Groupings' with their categories (Frequency)

Cognitive/behavioral barriers (65)	**Attitudinal/rational-emotive barriers (58)**
Knowledge (38)	Efficacy/perceived competence (16)
Awareness (13)	Perceived/outcome expectancy (16)
Skill/expertise (9)	Confidence in abilities (15)
Critical appraisal skills (5)	Authority (9)
	Accurate self-assessment (2)
Health care professional/physician barriers (62)	**Clinical practice guidelines/evidence barriers (41)**
Characteristics (29)	Utility (11)
Age/maturity of practice (11)	Evidence/disagree content (11)
Professional boundaries (7)	Access (10)
Legal issues (5)	Structure (5)
Peer influence, models (5)	Local applicability (4)
Gender (3)	Utility (11)
Inertia (2)	
System/process barriers (62)	**Support/resource barriers (69)**
Organizational (20)	Time (31)
System (17)	Support (15)
HR/workload/overload (10)	Costs/funding issues (12)
Team structure/work (9)	Resources (11)
Referral process (6)	
Patient barriers (30)	
Patient characteristics/factors (20)	
Patient adherence (10)	

Table 3: Gagliardi et al. (2011) [8] Final framework of guideline implementability

Domain	Element	Examples
Usability	Navigation	Table of contents
	Evidence format	Narrative, tabulated or both
	Recommendation format	Narrative, graphic (algorithms) or both; Recommendation summary (single list in full or summary version)
Adaptability	Alternate versions	Summary (print, electronic for PDA); Patient (tailored for patients/caregivers); Published (journal)
Validity	Number of references	Total number of distinct references to evidence upon which recommendations are based
	Evidence graded	A system is used to categorize quality of evidence supporting each recommendation
	Number of recommendations	Total number of distinct recommendations (sub-recommendations considered same)
Applicability	Individualization	Clinical information (indications, criteria, risk factors, drug dosing) that facilitates application of the recommendations explicitly highlighted as tips or practical issues using sub-titles or text boxes, or summarized in tables and referred to in recommendations or narrative contextualizing recommendations
Communicability	Patient education or involvement	Informational or educational resources for patients/caregivers, questions for clinicians to facilitate discussion, or contact information (phone, fax, email or URL) to acquire informational or educational resources
Accommodation	Objective	Explicitly stated purpose of guideline (clinical decision making, education, policy, quality improvement)
	Users	Who would deliver/enable delivery of recommendations (individuals, teams, departments, institutions, managers, policy makers, internal/external agents), who would receive the services (patients/caregivers)
	User needs/values	Identification of stakeholder needs, perspectives, interests or values
	Technical	Equipment or technology needed, or the way services should be organized to deliver recommendations
	Regulatory	Industrial standards for equipment or technology, or policy regarding their use
	Human resources	Type and number of health professionals needed to deliver recommended services
	Professional	Education, training or competencies needed by clinicians/staff to deliver recommendations
	Impact	Anticipated changes in workflow or processes during/after adoption of recommendations

	Costs	Direct or productivity costs incurred as a result of acquiring resources or training needed to accommodate recommendations, or as a result of service reductions during transition from old to new processes
Implementation	Barriers/facilitators	Individual, organizational, or system barriers that are associated with adoption
	Tools	Instructions, tools or templates to tailor guideline/recommendations for local context; Point-of-care templates/forms (clinical assessment, standard orders)
	Strategies	Possible mechanisms by which to implement guideline/recommendations
Evaluation	Monitoring	Suggestions for evaluating compliance with organization, delivery and outcomes of recommendations, including program evaluation, audit tools, and performance measures/quality indicators