**NDT Perspectives**

**Bridging the gap between what is known and what we do in renal medicine: improving implementability of the European Renal Best Practice guidelines**

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**ABSTRACT**

The increasing volume of evidence on how to treat kidney patients makes it difficult for nephrologists and renal nurses to keep up-to-date. This potentially widens the gap between what is known about best practice and how daily renal care is provided. Rigorously developed clinical practice guidelines can be important tools to bridge this gap. However, just developing and publishing guidelines does not ensure their use in actual practice. In this paper, we distinguish and illustrate three types of modifiable factors (i.e. barriers) that potentially impede renal healthcare professionals to provide care according to the guidelines: barriers related to knowledge, to attitudes and to behaviour. European Renal Best Practice (ERBP) produces guidelines for care of kidney patients in Europe and neighbouring regions. To facilitate implementation of its guidelines, ERBP aims to optimize ‘guideline implementability’, which regards the intrinsic characteristics of guidelines (i.e. format and content). The last section of this paper describes some of the associated ERBP activities, which are planned or pending.

**Keywords:** chronic renal insufficiency, guideline adherence, guidelines as topic

**THE GAP BETWEEN WHAT IS KNOWN AND WHAT WE DO**

Already in 2001, Shaneyfelt [1] suggested that a general internist would have to read almost 20 articles a day to keep his clinical knowledge up-to-date. An update of this anecdote was provided by Bastian et al., who reported a staggering 11 systematic reviews and 75 controlled trials being published every day. They showed an upward trend with no sign of a plateau and a curve for case reports and non-systematic narrative reviews that was even steeper [2]. Although only a small fraction of studies in renal medicine are trials or systematic reviews [3], the trend in the total number of publications is in the same direction (Figure 1).

Although an increasing volume of evidence on how to treat patients is encouraging, huge numbers of publications also make it difficult for healthcare professionals to keep up-to-date. Moreover, it hampers the drawing of straightforward conclusions on how to treat their patients. Systematic reviews and meta-analyses may partly address this problem by collating evidence on the effect of certain interventions, but studies have shown subjective variation in how they are interpreted by individual clinicians [4, 5]. This potentially contributes to increasing practice variation and a widening gap between what is known about best practice and how daily care is provided. The ultimate consequence may be that many kidney patients receive treatments based on their nephrologist’s personal preference, training or even exposure to sales representatives, rather than therapies most likely to benefit their health.

**WILL GUIDELINES BRIDGE THE GAP? NOT IF WE JUST ‘SPRAY AND PRAY’**

Rigorously developed clinical practice guidelines can be useful tools to bridge the gap between knowledge and practice. First
of all, because they are a systematic synthesis of the totality of evidence, including a formal procedure to appraise the risk of bias of this evidence by a group of methodological and clinical experts. Furthermore, they translate the findings into recommendations and suggestions on what should and should not be done in specific clinical situations, while taking into account the viewpoints of different stakeholders [6]. The European Renal Best Practice (ERBP) is one of the leading organizations producing guidelines for kidney patients in Europe and neighbouring regions [7].

Just developing and publishing guidelines—aptly referred to by Stevens and Tomson [8] as ‘the spray and pray approach’—does not ensure their use in daily renal practice [9–12]. Several theoretical frameworks have been proposed for categorizing and understanding the factors that affect the uptake of evidence into routine care [13–16]. One of the frameworks that has become widely accepted was developed by Cabana et al. [13]. Building on Woolf’s ‘mechanism of action’ by which guidelines result in improved patient outcomes [17], they categorized modifiable factors (i.e. barriers) that may impede clinicians to provide care according to the guidelines. They distinguished three types of barriers: those related to knowledge, to attitudes and to behaviour (Figure 2). We illustrate each of these three—often interrelated—categories below.

**Barriers related to knowledge**

The main barriers related to knowledge are lack of awareness and lack of familiarity with a particular guideline on a specific topic. The dazzling number of available guidelines is one of the alleged culprits: the US National Guideline Clearinghouse currently contains more than 2600 guideline summaries [18], while the number of guidelines and related documents in the International Guideline Library of the Guideline International Network (G-I-N) [19] even exceed 7500 [20]. However, two Australian studies investigating lack of awareness on a guideline of managing iron [21] and mineral-bone disorder [22] among nephrologists and renal nurses concluded that this was not a prominent reason for not following the recommendations. In contrast, a study among pharmacists caring for patients with chronic kidney disease (CKD) reported that almost half of the respondents were not (at all) familiar with the Kidney Disease Outcomes Quality Initiative (K/DOQI) guidelines from the National Kidney Foundation (NKF) [23].

**Barriers related to attitude**

The lack of agreement with guidelines is one of the main attitude-related barriers. Irving et al. explored nephrologists’ agreement with Caring for Australasians with Renal Impairment (CARI) guidelines and found an overall high level of trust in the development process and the output. Although some participants valued opinion-based statements, they also reported that guidelines based on strong evidence were more likely to be put into practice [24]. This may imply that factors like the persistent low number of randomized controlled trials in renal medicine [3] or trial publications not meeting reporting standards [25, 26] potentially diminish clinicians’ agreement.
A related barrier is the lack of outcome expectancy, which refers to renal clinicians not being convinced that adhering to the guideline will lead to better patient outcomes. Whereas in some cases, adherence to guideline-based targets seemed to be positively associated with outcomes [27, 28], other guidelines needed significant revision based on the results from later, rigorous studies [29]. In addition, a lack of conclusive evidence that following the guideline is beneficial might also contribute to scepticism. For example, the MASTERPLAN study achieved a modest improvement in adherence to recommendations for cardiovascular disease risk management in CKD patients, but without any change in clinically important outcomes such as cardiovascular death and stroke [30]. The risk of scepticism further increases when guidelines are translated into clinical performance indicators to judge the quality of a service, or in pay-for-performance schemes. For example, the National Health Service in the UK recently established a pay-for-performance schemes. For example, the National performance indicators to judge the quality of a service, or in cardiovascular death and stroke [30]. The risk of scepticism further increases when guidelines are translated into clinical performance indicators to judge the quality of a service, or in pay-for-performance schemes. For example, the National Health Service in the UK recently established a ‘best practice tariff’ for vascular access in which haemodialysis via a fistula is reimbursed at a higher price than haemodialysis through a catheter. This financial incentive may drive centres to do ‘better’ at constructing arteriovenous (AV) fistulae, but at the same time, it disregards collateral harm when elderly people with vascular disease are ‘forced’ to have a fistula as permanent access [31, 32].

A last example of an attitude-related barrier is the lack of self-efficacy. This applies to situations where clinicians agree with the recommended practice and believe that adherence will contribute to improved outcomes for their patients, but do not know how to change their routine care delivery according to the guideline. Despite the many valuable initiatives that have been described in the literature [33], the lack of self-efficacy is expected to be common in a complex care domain like nephrology, where patients have life-long disease and frequent multimorbidity, and where multiple healthcare professionals and settings are involved. Implementing guidelines in this complex context requires clinicians to think at a system level rather than at a patient level and to get familiar with quality improvement techniques to redesign their own care delivery system [34].

**Barriers related to behaviour**

All external barriers—i.e. those not related to a clinician’s knowledge or attitude—are placed in Cabana’s ‘behaviour related’ category. This includes factors related to the patient, the guideline itself or the environment. The interaction between patient factors and guideline adherence is particularly delicate when it involves older and chronically ill patients suffering from more than one condition, like many patients with CKD. First of all, because guidelines seldom explicitly account for people with multimorbidity [35] and because following all guidelines relevant for patients with multiple conditions may not necessarily be the best thing to do. It may even cause harm, for example, because of unforeseen interactions or even conflicts between treatments recommended by different guidelines, or because of the unknown long-term consequences of certain medications [36]. Furthermore, older or sicker patients may perceive less need for guideline adherence since they do not always value the expected benefits, such as longer survival or prevention of adverse events, as much as other patients [37].

Features of the guideline itself form another potential barrier affecting the ability to perform a recommended behaviour, such as the wording of the recommendations: the more specific and concrete a clinical action is formulated, the more likely it is to be understood, remembered and carried out appropriately [38, 39]. This would assist clinicians’ familiarity with a guideline.

Inconsistent recommendations between different guidelines on the same topic, which have been reported within nephrology [40, 41], might decrease the trust clinicians have in guidelines. For example, Tong et al. compared 10 different guidelines on the topic of kidney donor assessment and found important differences regarding the strictness of criteria to preclude donation. They suggested that this variability was potentially explained by the fact that many of the criteria were based on expert opinion or sparse evidence [40].

Finally, environmental barriers include factors such as insufficient staff, shortage of equipment, lack of support from policymakers and poor reimbursement. For example, in an Australian study, clinicians perceived lack of formal policies for patient referral, long waiting times for surgical review and access placement and lack of a patient management system as organizational barriers for timely creation of AV fistulae [42].

**BUILDING THE BRIDGE: SELECTING THE RIGHT IMPLEMENTATION STRATEGY**

The previous section showed a large variety of potential barriers that may hamper the implementation of guidelines, making it impossible to identify one strategy that would target all of them. The Cochrane Effective Practice and Organisation of Care (EPOC) group defined a taxonomy of interventions designed to improve the delivery, practice and organization of healthcare services [43]. This includes health professional-oriented strategies (e.g. audit and feedback); organizational strategies (e.g. nurse taking over a physician’s task); financial strategies (e.g. pay for performance) and patient-oriented strategies (e.g. patient education). The systematic review of van der Veer et al. [33] used the EPOC taxonomy as the starting point for identifying implementation strategies within the domain of renal replacement therapy. Although they concluded that multifaceted strategies may be more effective than those consisting of a single element, no conclusions could be drawn on which combination of strategies was best. This was in line with the results of an extensive review on the effectiveness of guideline dissemination and implementation strategies [44]. What is most likely to be an effective strategy depends on the topic of the guideline as well as the context in which it is implemented. Several systematic approaches have been suggested to get knowledge into practice [45–47]. Most of them include steps like deciding what knowledge or guideline to implement, assessing barriers to knowledge use, selecting and tailoring a suitable strategy to target those barriers, evaluating the effect of the strategy and sustaining the effect in case the strategy appears successful.
ERBP ACTIVITIES TO FACILITATE IMPLEMENTATION: OPTIMIZING GUIDELINE IMPLEMENTABILITY

As a first step in facilitating implementation of its guidelines, ERBP will focus on improving ‘guideline implementability’. This regards optimizing the intrinsic characteristics of guidelines, i.e. format and content. Three main reasons support this choice:

(i) Leading reports and previous studies have advocated a focus on improving guideline implementability as a way to positively affect if and how guidelines are used in practice [39, 48–51]. Also the Cabana’s barrier framework, which we discussed before (Figure 2), suggests that optimizing guideline factors may positively affect attitudes of guideline users, as well as their familiarity with guideline content [13].

(ii) It is in line with the last part of ERBP’s mission statement: ‘To improve the outcome of patients with kidney disease in a sustainable way, through enhancing the accessibility of knowledge on patient care, in a format that stimulates its use in clinical practice’.

(iii) The guideline format and content are under direct influence of ERBP.

Below we describe some of the planned and pending ERBP activities aimed at improving guideline implementability (Table 1).

Increasing transparency of the guideline development process

As mentioned above, part of the current lack of agreement with renal guidelines could stem from the paucity of high-quality trials in nephrology. In the absence of strong evidence, renal guideline organizations are often compelled to depend substantially on expert consensus regarding the relative importance of specific outcomes, to what extent this may vary between patients and whether benefits outweigh the harms. To clarify what part is played by the quality of the evidence and what part by these other considerations, ERBP has adopted the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) framework [52]. To further ensure transparency of ERBP’s guideline development process, we also incorporated the methodological principles from the Appraisal of Guidelines, Research and Evaluation (AGREE) II framework [53]. It consists of 23 criteria in six domains, such as rigour of development (e.g. criteria for selecting evidence are clearly described) and editorial independence (e.g. competing interests of guideline development group members have been recorded and addressed). Each new ERBP guideline will be accompanied by a publicly available development protocol containing information on how the AGREE criteria have been addressed.

Making the recommendations actionable

AGREE II states that recommendations should be specific and unambiguous. Although a weak evidence base is often at odds with formulating directive and specific recommendations, ERBP strives to make its future guidelines as actionable as possible by integrating the electronic Guideline Implementability Appraisal (eGLIA) tool into the guideline development process [54]. This tool enables structured identification of expected implementability problems related to the recommendations. A separate panel of clinical and methodological experts performs the appraisal, based on which they provide suggestions to the guideline development group on how to reformulate the statements. For example, ‘we recommend ureteric stent insertion in transplantation’ would be more specific when reformulated as ‘we recommend prophylactic ureteric stent placement as a routine surgical practice in adult kidney

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<td>Targeting end-users’ lack of agreement with and trust in ERBP guidelines</td>
<td>Increasing transparency and rigour of the guideline development process</td>
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<td>• Grading the strength of guideline recommendations and the quality of the underlying evidence using the GRADE framework</td>
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<tr>
<td>• Providing guidelines with a publically available development protocol including information on how AGREE criteria have been addressed</td>
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<tr>
<td>Targeting barriers related to guideline factors</td>
<td>Optimizing the actionability of guideline recommendations</td>
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<td>• Integrating eGLIA into the ERBP guideline development methodology</td>
<td>Facilitating reconciliation of patient preferences with recommendations; increasing relevance of guidelines for patients</td>
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<td>Targeting barriers related to patient factors</td>
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<td>• Promoting the ADAPTE process and providing expertise for adaptation of ERBP guidelines by national guideline bodies</td>
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Table 1. Planned and pending ERBP activities to facilitate guideline implementation, grouped by the main barrier they are targeting

transplantation’. In case the evidence does not allow such further specification, the guideline group could state this explicitly in the rationale. The eGLIA appraisal was designed to also highlight other types of problems that might hamper future implementation of the guideline in daily clinical practice, such as a recommendation being inconsistent with clinicians’ existing attitudes and beliefs, or causing a substantial disruption in current workflow. After being made aware of such barriers, the guideline development group should decide whether they still feel the potential benefits of the recommended action justify its inclusion in the final guideline. If so, the barriers are summarized in a separate implementation section together with advice on how to overcome them and considerations of potential resource implications. However, if the guideline group appears to have substantial doubts about the action’s added value, they may consider omitting or changing the statement or acknowledging in the rationale that the expected implementation costs may outweigh the likely benefits.

Involving patients in guideline development

By timely seeking the views and preferences of patients— which is another AGREE II criterion—we aim to anticipate patient-related barriers. There are different ways to involve patients: consultation (collecting information from patients, e.g. through a public poll or survey); participation (exchanging information with patients, e.g. by inviting a patient representative as a guideline group member) and communication (presenting information to patients, e.g. by producing plain language versions of guidelines) [55]. A review of existing patient and public involvement programmes showed that patients’ input was mainly asked for formulating recommendations, synthesizing the knowledge and revising drafts [56]. However, also earlier stages of the guideline development process may benefit from patient involvement [56, 57]. The same review showed a large variety of patient involvement strategies [56], but there seems no empirical basis for preferring one strategy to another [58].

For the upcoming ERBP guideline on permanent vascular access, our strategy for patient involvement will be a mix of consultation and participation. First of all, and in addition to consulting clinicians, we plan to consult an international patient panel in a three-round Delphi consensus procedure to identify which topics they consider high priority. The results will form input for determining the guideline scope. Since a Delphi procedure does not include face-to-face interaction between panelists, patients members can more easily act as equal partners in the discussion. Second, we will invite a patient representative as a member of the guideline development group. For this, we will build on the experience of other guideline organizations with how to best accommodate the patient’s role within the group [55]. Apart from being asked to articulate the patient view during the scoping phase, the patient representative will inform the drafting of the recommendations; for example, by signalling that certain recommended actions (e.g. strict dietary instructions; prescription of multiple medications; frequent home measurements) may interact with those for other conditions or are conflicting with general patient expectations. Especially for recommendations where high level evidence is lacking, additional information from the patient representative may play a pivotal role in the consensus process. Lastly, we plan a formal evaluation of the process and output of patient involvement in the vascular access guideline project. With this we hope to contribute to the—currently sparse—knowledge on optimal strategies for and added value of involving patients in guideline development.

A previous Cochrane review found limited evidence on how to increase healthcare professionals’ adoption of shared decision-making. Nevertheless, they suggested the use of patient decision aids as a potentially effective intervention [59]. Especially if recommendations are graded as ‘weak’, such decision aids may support clinicians with explaining the options and evidence to patients in a way that takes into account the weight that different patients attribute to different outcomes [52]. Therefore, ERBP plans to improve communication with patients by providing guideline-based tools for shared decision-making. Based on the recently published ERBP guideline on kidney donor and recipient evaluation, we will develop a tool to support potential donors with the decision whether to donate a kidney. Input for the tool will be collected by consulting individual patients during user tests [60].

Matching ERBP guidelines to national contexts

The international scope of ERBP guidance covers myriad national healthcare and reimbursement systems, which challenges the match between European guidelines and the variety of local contexts. Especially for some parts of dialysis care, such as vascular access creation, the local context of a national healthcare system strongly influences the level of adherence to guidelines. To map out system-level factors that may affect the implementation of vascular access guidelines, we have surveyed national experts from the ERA-EDTA community on how vascular access care is organized and reimbursed in their country. We will use the survey results as input for the development of the new ERBP vascular access guideline. This way, like with the eGLIA appraisal, we aspire to avoid recommending practices—especially those not supported by a strong evidence base—that are unlikely to be implemented. For example, because in the majority of European countries, there appears to be a lack of reimbursement or expertise.

Another strategy for optimizing the applicability of ERBP guidance within national contexts is promoting guideline adaptation among national guideline bodies in Europe. One well-known approach is the ADAPTE process. It provides a validated and systematic way to consider ‘the endorsement or modification of guidelines produced in one setting for application and implementation in another, […] while preserving evidence-based principles’ [61]. The process consists of 24 steps in three phases, which are described comprehensively in a freely available resource toolkit [62]. On request, ERBP provides methodological, information retrieval or implementation expertise to complement national ADAPTE panels (see Step 4 in the toolkit [62]).
CONCLUSION

Just developing and publishing guidelines is not enough to bridge the gap between what is known and what clinicians do in renal medicine. Many steps are required to ensure the actual uptake of guideline recommendations in daily care. As a first step on this long and winding road, ERBP will focus on improving implementability of its guidelines in renal practice and thereby contributing to more kidney patients receiving optimal care.

CONFLICT OF INTEREST STATEMENT

The authors have had no involvements that might raise the question of bias in the work reported or in the conclusions, implications, or opinions stated. The authors declare that this paper has not been published previously in whole or part.

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