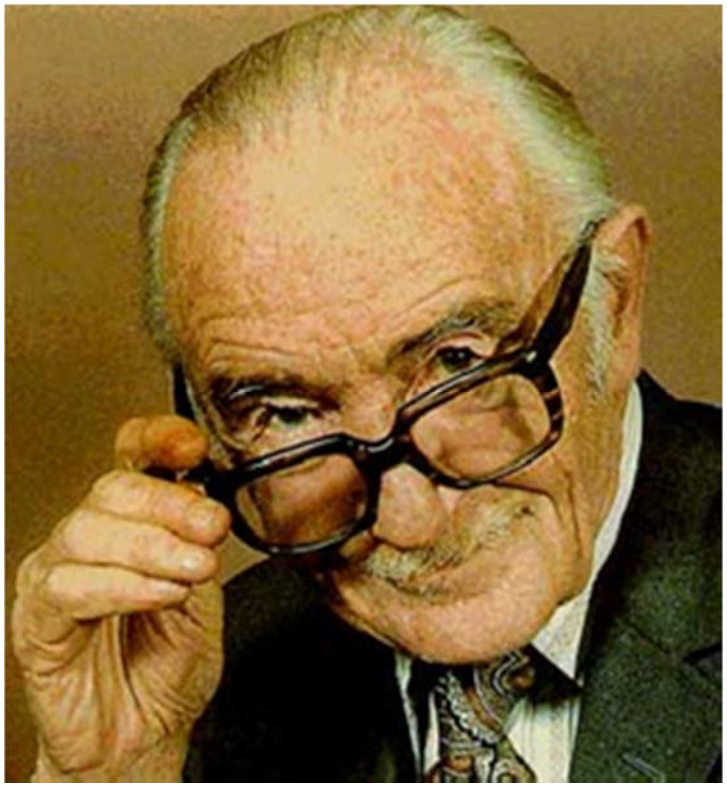
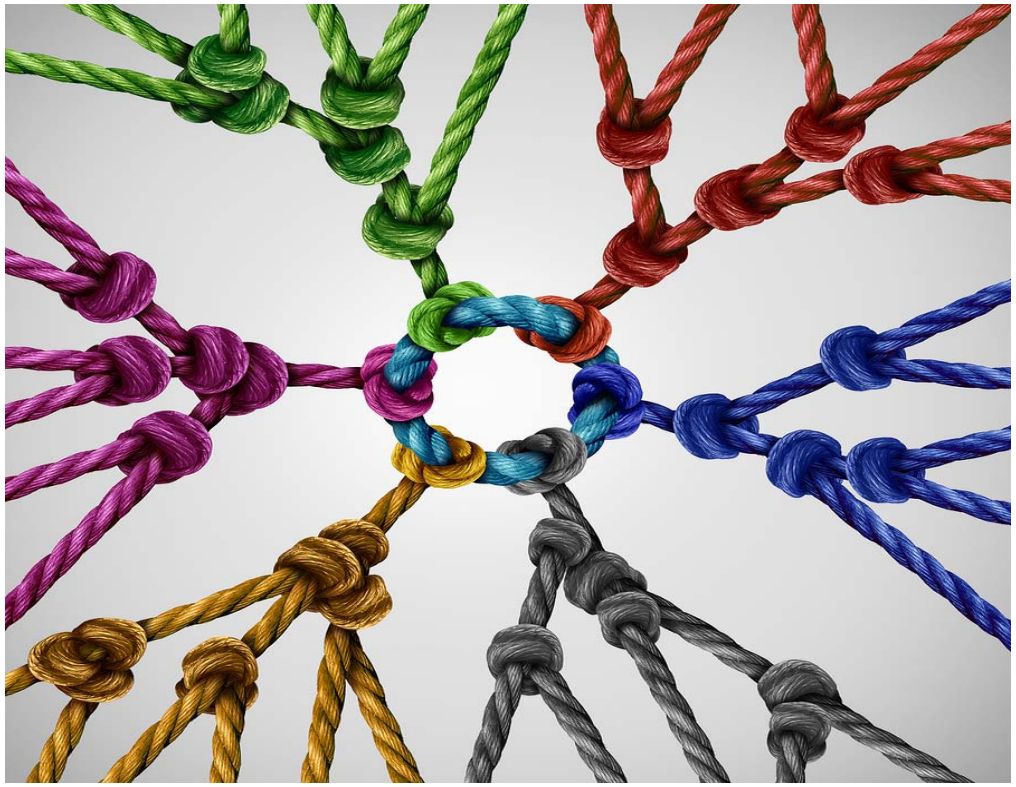
KCE REPORT 291

Federaal Kenniscentrum voor de Gezondheidszorg
Centre Fédéral d'Expertise des Soins de Santé
Belgian Health Care Knowledge Centre

TOWARDS AN INTEGRATED EVIDENCE-BASED PRACTICE PLAN IN BELGIUM

PART 4 – EBP IMPLEMENTATION IN PRIMARY HEALTH CARE IN BELGIUM





KCE REPORT 291
HEALTH SERVICES RESEARCH

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TOWARDS AN INTEGRATED EVIDENCE-BASED PRACTICE PLAN IN BELGIUM

PART 4 – EBP IMPLEMENTATION IN PRIMARY HEALTH CARE IN BELGIUM

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
IKNL	Integraal Kankercentrum Nederland
NHG	Nederlands Huisartsen Genootschap - Dutch college of GP
NICE	National Institute for Health and Care Excellence
SIGN	Scottish Intercollegiate Guidelines Network
S1	Synthesis in French and Dutch on the governance structure for the EBP Programme
S2	Synthesis in French and Dutch on implementation and performance management of EBP in primary care in Belgium
SB	Scientific Background chapter of this report
FOD – SPF	Federale Overheidsdienst – Service Public Fédéral – Federal Public Service
FAGG – AFMPS	Federaal Agentschap voor Geneesmiddelen en Gezondheidsproducten – Agence Fédérale des Médicaments et des Produits de Santé – Federal Agency for Medicines and Health Products
RIZIV – INAMI	Rijksinstituut voor ziekte- en invaliditeitsverzekering – Institut national d'assurance maladie-invalidité – National institute for health and disability insurance

SUMMARY

This report was written in a context of the development of a national Plan for Evidence Based Practice (EBP) in Belgium. This EBP Plan should allow to install an EBP Programme, and should strengthen the efficiency and quality of care by steering and coordinating EBP related activities in Belgium at the federal level. This document is the fourth of a set of five chapters that served as scientific background for the development of the EBP Plan.

Among others, the EBP Plan aims to improve implementation of EBP guidelines and EBP products in the Belgian primary health care.

Implementation refers to the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings. Implementation does not refer to spontaneous distribution of information (diffusion) or targeted distribution of information and intervention materials (dissemination). In practice, the phases of dissemination and implementation are often closely intertwined.

Evidence is available on which strategies are effective for implementation of clinical practice guidelines. Audit and feedback, educational strategies and/or opinion leaders, educational outreach visits, or reminders are examples of effective implementation strategies. Although significant impact on clinical practice is possible, it should be kept in mind that the effect of these strategies is usually small.

Specific interventions or implementation techniques based on insights from the broader social sciences have recently been considered to ameliorate the use of evidence. Examples are social marketing, behavioural “nudges” or persuasive communication techniques. The real impact of such strategies on the use of evidence in health care is yet unknown because their application in this context only started recently.

Recent insights of implementation science show that the choice of an implementation strategy should be guided by an evaluation of the needs of the end-users, as well as the barriers and facilitators that exist in the broader context in which the guideline or EBP product will be implemented. The implementation strategy should then be tailored to address these needs and barriers while taking advantage from the facilitators. Most of the time, these needs and barriers are diverse and complex, and therefore multifaceted interventions are more likely to give positive results. There is indeed evidence that multifaceted interventions for the implementation of clinical practice guidelines usually provide greater impact on clinical practice than single interventions.

Implementation is a part of the EBP Life cycle (see SB2, and S1). Its fulfilment requires the set-up of an implementation platform that will be responsible for the coordination of the scientific methods and procedures linked to guideline implementation. The activities of the platform should be closely connected to the activities of the dissemination platform (the previous stage of the EBP Life cycle). Currently, implementation activities for EBP guidelines or products are only rarely set up in Belgium. To make this platform a success, input from expert(s) with knowledge such as social marketing or persuasive communication techniques should be foreseen. Guideline development agencies abroad who work already with implementation specialists, such as NICE, IKNL or NHG, could be contacted to learn from their strategies and experiences[1].

SCIENTIFIC REPORT

1 AN IMPLEMENTATION PLAN FOR EBP: BASIC PRINCIPLES

About this document

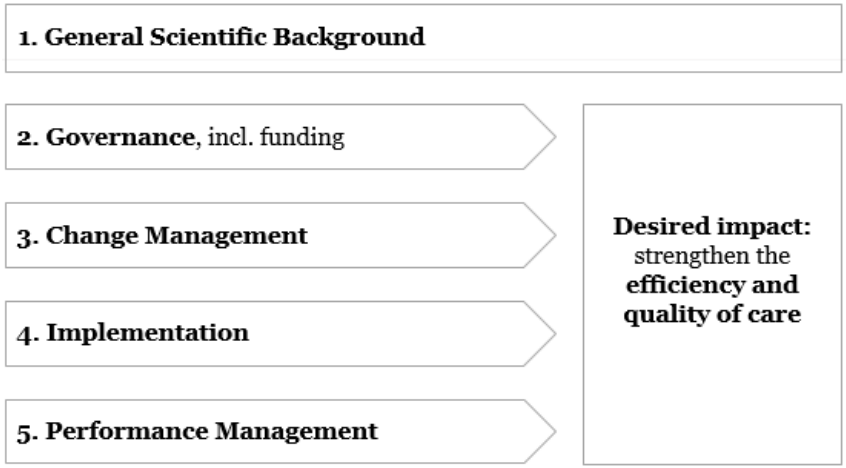
In June 2016, the Minister of Social Affairs and Public Health wrote a conceptual note regarding the need to strengthen the Evidence Based Practice (EBP) policy in Belgium. At the same time, the Minister commissioned KCE to provide the scientific background necessary to develop an EBP Plan for Belgium. This EBP Plan should allow to install an EBP Programme, and should strengthen the efficiency and quality of care by steering and coordinating EBP related activities in Belgium at the federal level. In a first time, it should address primary health care professionals. After evaluation, extension to secondary care will be considered.

Two Syntheses available in French and Dutch summarize the EBP Plan developed by KCE. The first Synthesis deals with the overall aim of the national EBP Programme, and with its governance structure. It was developed in close collaboration with the Steering Group appointed by the Minister, and composed by representatives of RIZIV/INAMI, FOD Volksgezondheid – SPF Santé publique, FAGG – AFMPS, KCE, Cabinet of the Minister of Social Affairs and Public Health). A second Synthesis deals with issues on change management, implementation, and performance management. We use S1 to refer to the first Synthesis, and S2 to refer to the second Synthesis.

This document is the fourth of a set of five chapters that served as scientific background for the development of the EBP Plan. The first of these chapters provides a general scientific background while the second chapter focuses on the governance structure of the EBP Programme. The third scientific background chapter is related to change management and leadership, and the fourth chapter aims to discuss EBP implementation issues in primary health care. The fifth chapter is dedicated to performance management of EBP implementation in primary health care in Belgium. An overview is visualised in Figure 1.

When we refer to one of these chapters, we use the abbreviation SB with the number associated to the chapter. E.g. the third scientific background chapter related to change management is referred to as SB3.

Figure 1 – Key themes in the development of the EBP Plan



Aim of the fourth chapter

The 'Conceptnota Evidence-Based Practice 21.06.2016' of the Belgian Minister for Social Affairs and Public Health stated that one of the main aims of the national EBP Programme is to improve implementation of EBP guidelines and other EBP products. This chapter focuses on how the EBP Programme can effectively improve implementation of EBP in Belgium. It aims to draw basic principles to support the design of a fully elaborated EBP implementation plan that will be developed in a later step.

Methods

The methods for SB1 are stipulated in the document. The draft of this chapter was discussed with the federal Steering Group in a dedicated meeting on March 9th 2017.

The point of departure for SB2, SB3, and SB5 was the science based knowledge in the field of leadership & change theory, network governance theory, organizational learning theory, and evaluation theory brought to the fore by the Technopolis Group[a] in collaboration with experts from the Antwerp Management School[b]. This was combined with their extensive practice based experience in governance, change management and evaluation of health care. For SB4, an existing systematic review served as a basis, updated with a limited literature search and grey literature, as stipulated in the document.

For each theme (Governance, Change and leadership, Implementation and Performance Management), intensive discussions and exchange of views took place, in order to settle on a basic draft for the chapter, relying on theory and practice, taking also into account the scientific information on EBP compiled in SB1.

In parallel, a consultative cycle commenced. Each cycle comprised the following steps:

- a thematic workshop with the KCE team and the federal Steering Group (April 6th 2017: Governance; May 8th 2017: Implementation and Performance management; May 9th 2017: Change and leadership);
- a consultative expert meeting with experts involved in development, validation and dissemination of EBP guidelines in Belgium (May 3th 2017: Governance; June 23th 2017: Change and leadership, Implementation and Performance management);

a http://www.technopolis-group.com/

b https://www.antwerpmanagementschool.be/

- a conclusive meeting with the federal Steering Group (June 8th 2017: Governance; October 25th 2017: Change and leadership, Implementation and Performance management).

Each thematic workshop comprised two to three presentations by experts from the Technopolis Group and the Antwerp Management School, followed by a discussion, in order to stimulate a balanced appraisal of the different views. Each meeting resulted in a common understanding of the theme.

Similarly to the thematic meetings, the consultative expert meetings were aimed to inform the experts about state of the art insights in relevant thematic areas. It started from two to three presentations and was followed by a discussion. About 15 experts participated in each of the meetings (see colophon). The results from these expert consultations were processed in the second draft of each of the chapters. Subsequently, in view of their extensive experience with EBP, the experts were invited to give written feedback on the second draft of the chapters.

In the next phase, the federal Steering Group concluded the final drafts of the chapters after discussion in a dedicated meeting.

Some key notions on the governance structure of the EBP Programme as proposed in this report.

For the governance structure during the initial transition phase, see S1 and SB2. At the final stage, six interconnected “phases” making up the so-called EBP Life cycle are recognised: prioritization, development, validation, dissemination, implementation, and evaluation. The scientific procedures related to each of these phases are under the responsibility of a cell or platform, which coordinates the scientific activities of the organizations participating in this phase. The overall programme and process management related to all of the 6 phases is under the responsibility of an independent administrative organization (NAO, Network administrative organisation). The NAO takes up the tactical and operational management of the EBP Programme. The Steering Group (RIZIV/INAMI, FOD Volksgezondheid – SPF Santé publique, FAGG – AFMPS, KCE, Cabinet of the Minister of Social Affairs and Public Health) is responsible for and has the power to strategically steer and finance the EBP Programme. The end users of the EBP products, primary health care professionals as well as patients, their relatives or patient representatives, can give feedback through the EBP Advisory Committee. More details can be found in S1 and SB2.

1.1 Diffusion, dissemination, implementation and implementability: definitions

Implementation and dissemination are closely intertwined, but nevertheless two different concepts.[1, 2]

Implementation refers to the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings. This involves the identification of and assistance in overcoming barriers to the application of new knowledge obtained from a disseminated message or program.[3] Dissemination on the other hand, is the targeted distribution of information and intervention materials to a specific public health or clinical practice audience[3], as opposed to diffusion, which is a spontaneous distribution and unaided adoption of information[4] (see also section 3.2 in SB1).

In other words, while dissemination refers to the tools and techniques used to (purposely) *communicate* evidence to end-users, implementation refers to the transfer of empirically supported interventions into real-world settings. Implementation is thus the part of the EBP product life cycle in which systems are introduced to *influence* clinicians' behaviour toward guideline adherence.[1] Notwithstanding these differences, many authors refer to dissemination and implementation as one concept, because of their close relationship.

In this chapter, the main focus will be on implementation. However, aspects of dissemination will be taken into account when relevant for the implementation process.

Another concept is implementability: this refers to a set of characteristics that “predict ease of (and obstacles to) guideline implementation”. As already pointed out in SB1, implementability relates to a number of factors, some of which are intrinsic to the guideline itself, and therefore are under the control of the developers, and some of which are extrinsic, related to the

processes following the development phase or related to the health care system in which the guideline is used. This implies that implementation of a guideline does not start after the development of this guideline but has to be taken into account extensively during the development phase, and also during the phases between development and actual implementation.

1.2 Intervention research vs implementation research

In the past decades, the science related to developing and identifying "evidence-based practices and programmes" has improved. However, the science related to implementing these programmes with fidelity and outcomes for consumers/patients/end-users lags far behind.[5]

For instance, Pronovost et al. (2004) indicate that 99% of the medical research budget is devoted to understanding disease biology and developing effective therapies, and 1% is devoted to learning how to implement those therapies safely with patients.[6] While this is better than it used to be (up from 0.25% in 1977, Brown & Flynn, 2002)[7], the disparity may help explain the current science to service gap.

KCE report 212 (2013) draws a similar conclusion: "Only few experiences relate to the evaluation of the impact on the practice. All interviewees regret that so much time, energy and financial resources were spent to develop and disseminate Clinical Practice Guidelines (CPG) without knowing whether these strategies have an impact on change of practice or not."[8]

Generating real impact through EBP guidelines, requires effective intervention practices as well as effective implementation practices, as is shown in Figure 2 below. This Figure, developed for a business context, shows that only the combination of effective intervention practices (implying good consumer outcomes) and effective implementation practices (implying good implementation outcomes) leads to real impact.

Figure 2 – Generating impact for Interventions

Impact = effective intervention practices * effective implementation practices

		Effectiveness of *Implementation* Practices	
		Effective	Ineffective
Effectiveness of *Intervention* Practices	Effective	Good Implementation Outcomes Good Consumer Outcomes	Poor Implementation Outcomes Poor Consumer Outcomes
	Ineffective	Good Implementation Outcomes Poor Consumer Outcomes	Poor Implementation Outcomes Poor Consumer Outcomes

Source: Fixsen et al., 2005[5]

1.3 Implementation frameworks

There is growing interest in the use of models and frameworks to gain insights into the mechanisms by which implementation is more likely to succeed. Many models have been developed to explain and visualize the implementation process of evidence-based practice[2]. Although empirical research is needed to study if the use of implementation models and frameworks contributes to more effective implementation, they are also useful in the sense that they create a meaningful context for individual facts (e.g. different implementation strategies) and they offer the advance of being explicit and open to question and examination.[9]

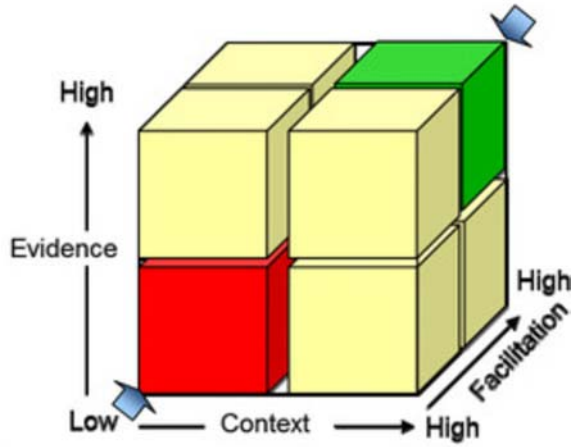
The Scientific Background part 1 (SB1) of this report and KCE report 284[1] present relevant frameworks and models in the context of EBP development and implementation. Two of them, specifically related to the phase of implementation, are further highlighted below: the PARiHS framework and the "research-to-practice pipeline" model. They can offer support during the further development of methods and procedures to make the implementation phase of the EBP Life cycle operational. A third model, related to the concept of implementability, will also be highlighted: the GUIDE-M model.

Attempts to change the behaviour of health professionals may be impeded by a variety of different barriers, obstacles, or factors, or supported by certain facilitators. These terms, often used in implementation literature, will collectively be referred to as determinants or determinants of practice.

1.3.1 The PARiHS framework

The PARiHS framework (Promoting Action on Research Implementation in Health Services) (Figure 3) is a framework that has been developed by Kitson and Rycroft-Malone[9-11]. It has been applied, for instance to evaluate what enables or hinders person centred continence care in rehabilitation settings for older people[12]. It emerged from the observation that successful implementation of evidence into practice in health care environments is determined by and more likely to occur in situations where (1) the research evidence is strong, there is a consensus about it among professionals and it matches patients' preferences, (2) the context is receptive to change, and (3) appropriate approaches and mechanisms of facilitation are in place.

Figure 3 – The PARiHS framework



Source: Kitson et al (2008)[11].

The two main aims of this framework are:

- (1) assessing change readiness, based on the three dimensions of the model, and defining weak and strong elements;
- (2) building implementation strategies while taking into account these weak and strong elements.

Several authors point to the complexity of the determinant "context", and recognize contextual variables, as well as barriers or facilitators for implementation, at three levels:[9]

- Micro-level: related to the individual practice of health care professionals or indivual patient;
- Meso-level: related to health care organisations and institutes;
- Macro-level: related to the broader social environment or policy level.

Nilsen et al (2015) further analysed eight of the most commonly cited frameworks in implementation science (among which the PARiHS framework)[9]. Five core implementation determinants emerged from this analysis. The PARiHS framework illustrates this well:

- characteristics of the implementation object itself (e.g. guideline);
- characteristics of the users/adopters (e.g. health care practitioners), i.e. micro-level;
- characteristics of the end users (e.g. patients), i.e. micro-level;
- characteristics of the (broader) context, i.e. meso- and macro-level;
- characteristics of the strategy or other means of facilitating implementation.

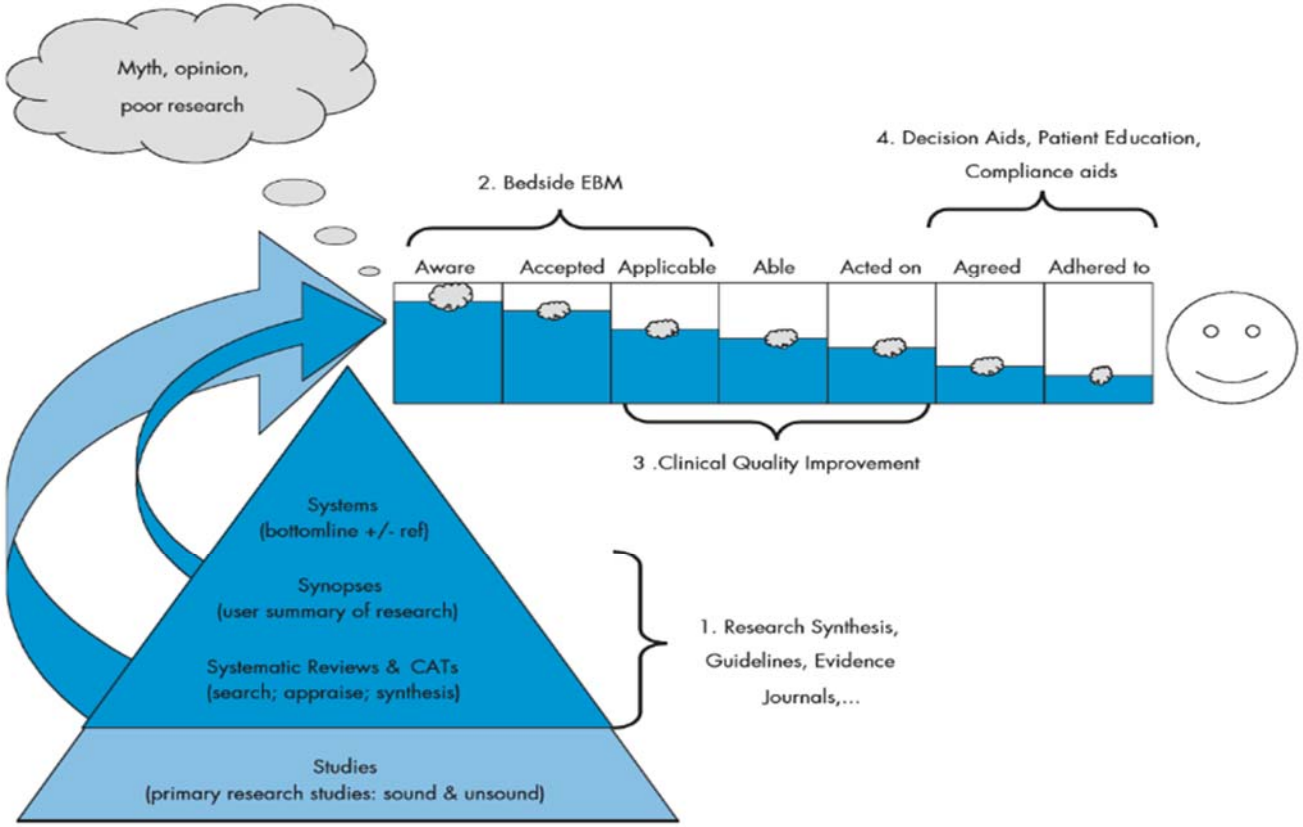
The different types of determinants specified in determinant frameworks such as the PARiHS framework can be linked to classic theories from other fields such as psychology, sociology and organizational theory. Thus, psychological theories that delineate factors influencing individual behaviour change are relevant for analysing how characteristics of users/adopters or end users affect implementation outcomes, whereas organizational theories concerning organizational climate, culture and leadership are more applicable for addressing the influence of the context on implementation outcomes[9].

In summary, initiatives to enhance implementation should start from an analysis of the actual situation, taking into account the three levels of implementation (micro-meso-macro), and the five core implementation determinants as described by Nilsen and illustrated in the PARiHS framework. Depending on the weak and strong elements emerging from this analysis, implementation strategies should be developed. This implies that multiple factors have to be taken into account to create the highest odds for implementation success[13]. It is worthwhile to consider psychological, sociological and other theories when developing implementation strategies, since they give insight in how human behaviour can be influenced or contextual factors can be addressed.

1.3.2 The "Research-to-Practice Pipeline" model

When evaluating change readiness, barriers and facilitators as proposed in the PARiHS framework, it is also worthwhile to consider the "research-to-practice pipeline" model (see Figure 4). This model, described by Glasziou et al (2005), defines 7 different consecutive stages where factors can hamper effective uptake in the transfer from EBP recommendations to clinical practice: awareness and availability, acceptance, and applicability of information, ability of users to work with EBP, intention to act on EBP in practice, and agreement and adherence of end users. Every stage implies barriers that might lead to a drop-out of clinicians, resulting in a lower impact of EBP on patient outcomes. Therefore the term 'leaking' is sometimes added to the name of the model. More details can be found in SB1 of this report and in KCE report 284.[1]

Figure 4 – The Research-to-Practice Pipeline



CAT: critical appraisal topic (EBP summary that answers a clinical question).
Systems: integrated ICT solutions that link EBP evidence directly with health care data and provide decision support

Source: Glasziou et al (2005)

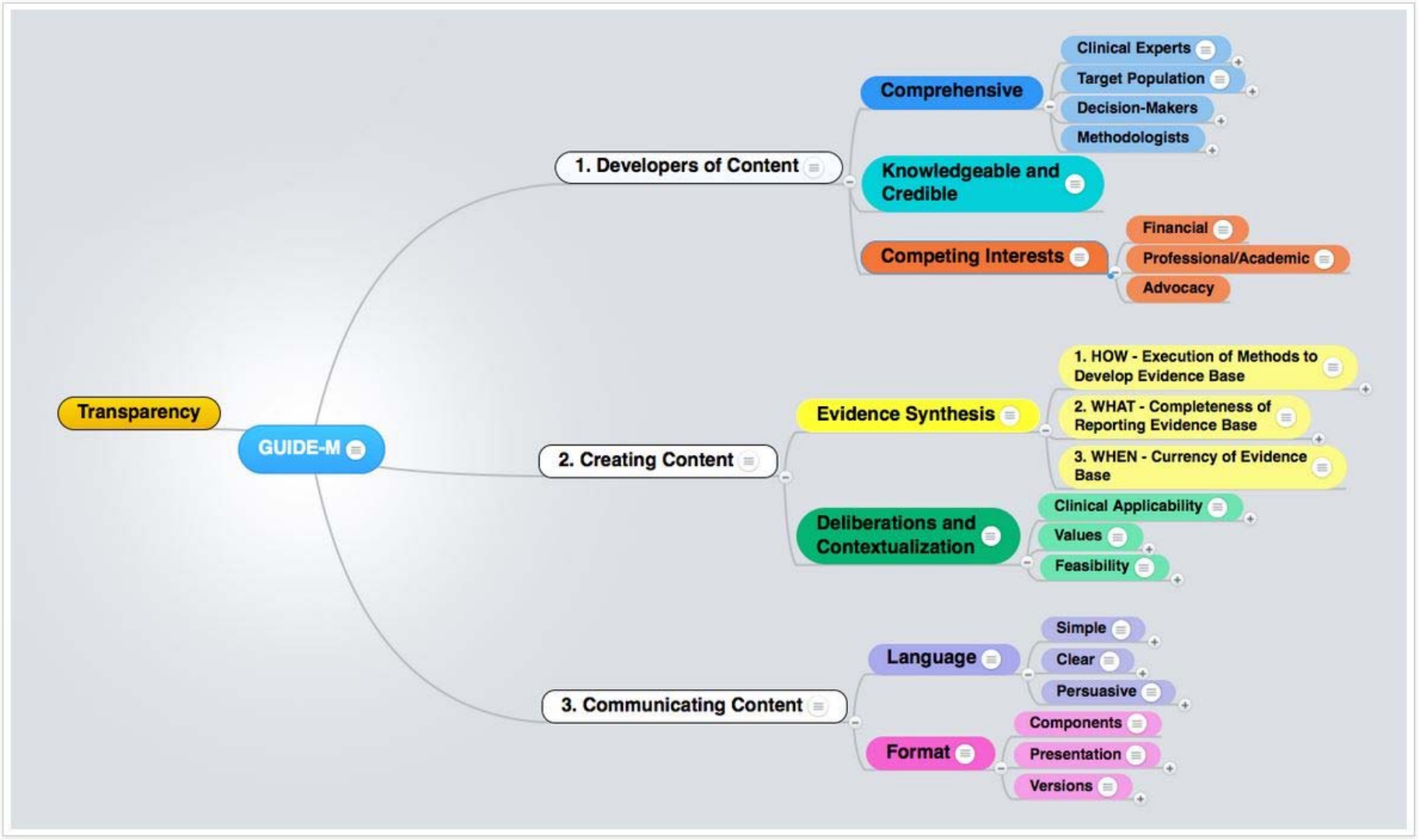
1.3.3 The GUIDE-M model

The GUIDE-M model (Guideline Implementability for Decision Excellence Model) consists of components intrinsic to CPG (Clinical Practice Guidelines) that play a role in optimizing the implementability of these CPG. This recently developed comprehensive model is based on a realist review of the literature and input of a collaborative network. It distinguishes between a broad set of potential facilitators or inhibitors. Several other models to identify implementation barriers have been presented in the last decade, such as the work of the GLIA group, GIRANet, IOM, FIN, GUIDE-IT and GRADE. However, these have (at least partly) been taken into account for the development of the GUIDE-M model[1].

The model consists of 3 core tactics (developers of content, creation of content and communication of content), 7 domains, 19 sub-domains, 44 attributes and 40 sub-attributes and elements. Figure 5 gives a clear visualisation of the model. More details can be found in KCE report 284[1] and an extensive description can be found online[c]. All of the elements, integrated in the model, have to be taken into account in the development of CPG, as they can impede or facilitate the effective implementation of evidence based practice in every day delivery of health care[c]. The GUIDE-M model is systematically used at the McMaster University (Canada) to improve implementability of their EBP products. Taking into account the current state of the science, the GUIDE-M model should be used as the reference model in the context of the Belgian EBP Programme, and should be included in the procedures of the development phase of the EBP Life cycle. The use of this model might be reconsidered when new evidence comes available.

c http://www.agreetrust.org/agree-research-projects/guide-m/

Figure 5 – The GUIDE-M model[1]



1.4 Implementation strategies: a classification

A multitude of possible strategies can improve implementation of guidelines. An often used classification system for these interventions, is the EPOC framework, developed by the Cochrane Group for Effective Practice and Organisation of Care.[14] This taxonomy of health systems interventions was revised in 2015 and has four main domains (for an overview, see appendix 1.1):

- delivery arrangements,
- financial arrangements,
- governance arrangements,
- implementation strategies.

All four domains should be considered for action in the context of better CPG implementation, but the most specific one is the domain of implementation strategies (see Table 1). A definition is given for each strategy. Although this taxonomy is very useful for this report, not all strategies are relevant, for instance “critical incident reporting” might be more relevant in the context of quality improvement processes.

Table 1 – EPOC classification of implementation strategies (2015)[14]

Implementation Strategies **Interventions designed to bring about changes in health care organizations, the behaviour of health care professionals or the use of health services by health care recipients**	
Category: **Interventions targeted at health care organisations**	
Subcategory	**Definition**
Organisational culture	Strategies to change organisational culture
Category: **Interventions targeted at health care workers**	
Subcategory	**Definition**
Audit and feedback	A summary of health workers' performance over a specified period of time, given to them in a written,
	Electronic or verbal format. The summary may include recommendations for clinical action.
Clinical incident reporting	System for reporting critical incidents,
Monitoring the performance of the delivery of health care	Monitoring of health services by individuals or health care organisations, for example by comparing with an external standard.
Communities of practice	Groups of people with a common interest who deepen their knowledge and expertise in this area by interacting on an ongoing basis
Continuous quality improvement	An iterative process to review and improve care that includes involvement of health care teams, analysis of a process or system, a structured process improvement method or problem solving approach, and use of data analysis to assess changes
Educational games	The use of games as an educational strategy to improve standards of care.
Educational materials	Distribution to individuals, or groups, of educational materials to support clinical care, i.e., any intervention in which knowledge is distributed. For example this may be facilitated by the internet, learning critical appraisal skills; skills for electronic retrieval of information, diagnostic formulation; question formulation
Educational meetings	Courses, workshops, conferences or other educational meetings
Educational outreach visits, or academic detailing.	Personal visits by a trained person to health workers in their own settings, to provide information with the aim of changing practice.
Clinical Practice Guidelines	Clinical guidelines are systematically developed statements to assist health care providers and patients to decide on appropriate health care for specific clinical circumstances'(US IOM).
Inter-professional education	Continuing education for health professionals that involves more than one profession in joint, interactive learning

Local consensus processes	Formal or informal local consensus processes, for example agreeing a clinical protocol to manage a patient group, adapting a guideline for a local health system or promoting the implementation of guidelines.
Local opinion leaders	The identification and use of identifiable local opinion leaders to promote good clinical practice.
Managerial supervision	Routine supervision visits by health staff.
Patient-mediated interventions	Any intervention aimed at changing the performance of health care professionals through interactions with patients, or information provided by or to patients.
Public release of performance data	Informing the public about health care providers by the release of performance data in written or electronic form.
Reminders	Manual or computerised interventions that prompt health workers to perform an action during a consultation with a patient, for example computer decision support systems.
Routine patient-reported outcome measures	Routine administration and reporting of patient- reported outcome measures to providers and/or patients
Tailored interventions	Interventions to change practice that are selected based on an assessment of barriers to change, for example through interviews or surveys.
Category: Interventions targeted at specific types of practice, conditions or settings	
• Health conditions	• Acute stroke • Acute surgery • Alcohol
• Practice and setting	• Health promotion in dental settings

Another taxonomy of guideline implementation strategies has been published by the GIRAnet network (Guideline Implementability Research and Application Network)[d]. This Working Group, affiliated with the Guidelines International Network (G-I-N), is an international collaboration of guideline developers, implementers and implementation researchers who aim at generating knowledge on, and promoting the practice of, guideline implementation and evaluation. The GIRAnet revised taxonomy of guideline implementation strategies can be found in appendix 1.2. It was generated from a scoping systematic review of 32 studies published from 2004 to 2013 that evaluated the implementation of guidelines on arthritis, diabetes, colorectal cancer and heart failure.

An interesting publication by Powell et al. (2015) reports on the Expert Recommendations for Implementing Change (ERIC) study.[15] This study refined a compilation of implementation strategy terms and definitions. The complete list and definitions of these implementation strategies can be found in appendix 1.3.

[d] http://www.g-i-n.net/working-groups/implementation

1.5 Implementation strategies: what works?

The focus of this section is on effectiveness of specific implementation interventions or techniques. However, interventions in delivery arrangements, financial arrangements, and governance arrangements (see section 1.4) should also be considered for improvement of EBP implementation. It was beyond the scope of this report to study these types of interventions.

To gain an understanding on what are effective and less effective implementation strategies for EBP implementation, especially insights of comprehensive literature reviews are relevant; as opposed to individual studies focusing on specific interventions, specific clinical practice guidelines, and/or specific type of health professionals as target audience.

Implementation strategies are discussed in medical and classical implementation science literature, as well as in the social science literature. In the medical and classical implementation science literature, there is a large focus on health care interventions, including some literature specifically about EBP implementation. In the social science literature evidence on implementation recently came available based on experiences in other contexts such as business marketing, management and psychology. They hold a body of knowledge on areas such as behaviour change, organisational change, learning and motivation. These insights can be very informative for implementation of CPGs as well. Many of these interventions or implementation principles are not mentioned in existing classifications of implementation strategies in health care, such as the EPOC classification. It might be that the recognition of the importance of such principles has only started recently.

The overview of the medical and classical implementation science literature in this report is based on a systematic review on effectiveness of strategies to disseminate and implement EBP guidelines among health care professionals, published in 2013 in a previous KCE report.[8] This review, based on a search up to November 2012, was built on Cochrane reviews and other high quality systematic reviews.

Due to time constraints, it was not possible to conduct an update of this publication. However, a quick search on relevant Cochrane reviews in the Cochrane Database of Systematic Reviews from November 2012 until July 2017, yielded two extra publications: Flodgren et al. (2016) on the effectiveness of tools developed and disseminated by guideline producers to promote the uptake of their guidelines[16], and Baker et al. (2015) on the effectiveness of tailored interventions to address determinants of practice.[17]

A Norwegian systematic review with an English summary, conducted by The Knowledge Centre for the Health Services which is part of the Norwegian Institute of Public Health, was mentioned by one of the experts during an expert meeting. The authors, Fretheim et al. (2015), report a meta-analysis on the effectiveness of different guideline implementation strategies in health care.[18]

The overview of the social science literature in this report is based on a broad grey literature search (see section 3.2.2 in SB1). This yielded a review published by the UK based "The Alliance for Useful Evidence".[e] The Alliance champions the use of evidence in social policy and practice; it is a network that promotes the use of high quality evidence in decision making. This organisation adopts a broad view on use of evidence in professional practice, paying some attention to the health care sector, but not limiting to it.

[e] http://www.alliance4usefulevidence.org/

1.5.1 *Which implementation strategies for clinical practice guidelines?*

The KCE report 212 on dissemination and implementation of EBP guidelines in Belgium revealed that audit and feedback, educational strategies and/or opinion leaders have a greater impact on the practice in multifaceted interventions than in single interventions. Reminders seem to be more effective as single interventions. Electronic dissemination strategies have the advantage to be incorporated in the work process of the clinicians and to combine different strategies as for example reminders, electronic educational materials. It was concluded that a dissemination strategy should be multifaceted, tailored to the characteristics of the clinicians and the patients, and with active participation of the actors.

A general remark was that although the impact on clinical practice of these implementation strategies was significant, the effect remained relatively small. Further, a limitation of this study is that only interventions aiming at professionals were included: other main categories of the EPOC taxonomy were excluded, namely financial interventions, organisational interventions or regulatory interventions. Also, most recent interventions (e.g. internet-based learning) were not yet included given the lack of reviews on this topic. Future strategies to improve uptake of EBP in the context of the EBP Programme should also consider these types of implementation strategies.

For instance, a lot of attention is being paid currently to Clinical Decision Support (CDS) systems, also called computerised decision support systems. CDS is a technology that provides patient-specific medical knowledge at the point of need: during the (medical) consultation, through links with the patient file. However, although promising, the benefits so far remain modest[19, 20]. The development of a checklist and tools to improve the use of CDS is underway: the GUIDES (Guideline Implementation with Decision Support) project funded through the European Union's Horizon 2020 Research and Innovation Programme[21].

It should be mentioned that some debate on the added value of multicomponent interventions exists. Some reviews state that although multicomponent interventions in general have more effect than single component interventions, in some circumstances single component interventions have shown to be as effective.[22-24] Insight in the underlying implementation barriers might be the explanation for this finding (see further).

Table 2 – Results of KCE report 212 on dissemination and implementation of EBP guidelines in Belgium[8]

A significant but small impact on clinical practice

- Reminders, educational meetings, educational outreach visits and opinion leaders have a significant impact on the clinical practice of health professionals, with median changes ranging from 5% to 23 %, according to the intervention and type of outcome.
- Audit and feedback have the smallest impact (median improvement in compliance with the desired practice of below 3%). The effect is noted for audit and feedback as a single intervention, but it is larger when it is used in a multifaceted intervention combined with educational outreach visits.
- Printed educational materials as single interventions also have a limited effect (median improvement in compliance with desired practice of between 3% and 13% according to the outcome). An interesting finding is that electronic guidelines do not produce a greater change in practice than printed educational material.
- Inter-professional education is a type of educational meeting that has been developed recently: health and social care professionals use interactive learning to improve inter-professional collaboration and/or health/wellbeing of patients. Inter-professional education as a single intervention has a non-significant impact on practice but does have an effect on clinical practice and patient satisfaction when integrated into multifaceted interventions.
- The search did not identify any systematic reviews on patient-mediated and mass media interventions.

Scarce evidence for beneficial patient outcomes

- The primary studies rarely analysed the effect of specific dissemination strategies on patient outcomes. A few studies showed a positive, though very limited impact of the following three strategies: audit and feedback, reminders, educational meetings.

Effectiveness of multifaceted interventions: yes, but which ones?

Multifaceted interventions were supported by many literature reviews. However, there is a lack of evidence on which would be the crucial components or optimal combination of strategies that would most likely improve adherence to guidelines. Moreover, the ideal number of interventions to be included in multifaceted interventions cannot be defined

The findings of the KCE review are largely confirmed in the more recent review by Fretheim et al. (2015)[18]. This publication consists of a review of 19 systematic reviews, 11 from a Cochrane overview and eight from supplementary searches. Included were systematic reviews published between 2005-2015, describing any strategy for implementing clinical practice guidelines in health professionals, as compared to no intervention or another strategy for guideline implementation.

A detailed comparison between the results of the KCE review and the results of the review by Fretheim et al. can be found in appendix 1.4.

In their meta-analysis, Fretheim et al. (2015) specifically reviewed the certainty of evidence regarding different guideline implementation strategies. Based on that review, they created a concise overview. It is important to note that "very low certainty" does not necessarily mean that these strategies are ineffective, rather that the quality of evidence is generally too weak to draw conclusions about effects on patient outcomes, utilisation of health services, or resource use.

[f] Personal visit to health professionals at their workplace, by someone educated for it, with the aim to ameliorate clinical practice in line with CPGs. The information presented to the professionals can include feedback on their practices.

Table 3 – Certainty of evidence that these strategies will increase adherence to clinical practice guidelines

Moderate certainty	Very low certainty
• Clinical decision-support systems (including reminders) • Educational outreach visits (including practice facilitation[f]) • Audit and feedback • Local opinion leaders • Tailored interventions • Educational meetings	• Internet-based learning • Inter-professional education • Printed educational materials • Economic incentives • Inter-professional collaboration • Checklists • Strategies to change organisational culture • Public release of performance data

Source: Fretheim et al. (2015) [18]

Fretheim et al. (2015) concluded that those responsible for guideline implementation should routinely consider rigorous evaluation as a component of any implementation strategy.[18] They also specifically stated that the impact of an implementation strategy may depend on specific characteristics of the strategy and the targeted health problem and professionals. Context is relevant.

Some interesting additional information comes from two recent Cochrane reviews.[17, 25]

Importance of tailoring the interventions

Baker et al. (2015) included 32 studies and evaluated whether tailored intervention strategies are effective in improving professional practice and health care outcomes.[17] This review was also included by Fretheim et al. (2015).[18] Tailored intervention strategies are frequently recommended among approaches to improve health professional performance. Change may be more likely if implementation strategies are specifically chosen to address the determinants impeding behavioural change. Tailored interventions to change professional practice are interventions planned following an investigation into the factors that explain current professional practice and any reasons for resisting new practice. The interventions applied in the studies included in the review were generally multifaceted. The findings indicated that tailored interventions can change professional practice, although they are not always effective and, when they are, the effect is small to moderate. There was insufficient evidence on the most effective approaches to tailoring, including how determinants should be identified, how decisions should be made on which determinants are most important to address, and how interventions should be selected to account for the important determinants. Knowledge on how to select and tailor implementation interventions to address contextual needs is currently under development, see e.g. the publication by Powell et al. (2017).[26]

Role of implementation tools developed by producers

Flodgren et al. (2016) evaluated the effectiveness of implementation tools developed and disseminated by guideline producers, which accompany or follow the publication of a CPG, to promote uptake.[25] Examples of such implementation tools are educational workshops, paper-based educational materials, order forms or reminders. Two randomized controlled trials could be included in the systematic review. The conclusion was that implementation tools probably lead to improved health care professionals' adherence to guidelines.

1.5.2 Which implementation strategies? Insights from the wider social science literature

The Alliance for Useful Evidence published a discussion paper "Using evidence, what works?" This discussion paper aimed to uncover the evidence on what works to increase the use of research by decision-makers.[27] It started from a systematic review of 36 existing reviews mostly on interventions in the health care sector. This was complemented by a second scoping review of research from the broader social science literature conducted by the EPPI-Centre (University College London).[28] More than 150 possible interventions were identified but there were many cases with mixed or no evidence. These interventions were not discussed in the review since the focus was on what did work as proved by evidence. The key findings from this literature review are summarised here. For the purpose of the review, the interventions were classified in a framework of 6 categories, based on the underlying mechanisms driving interventions as described in the literature. [28]

Figure 6 – Framework of mechanisms driving interventions implemented to increase the use of research by decision-makers [28]

Evidence-use mechanisms	
1	**Awareness** – Building awareness and positive attitudes towards evidence use
2	**Agree** – Building mutual understanding and agreement on policy-relevant questions and the kind of evidence needed to answer them
3	**Access and Communication** – Providing communication of, and access to, evidence
4	**Interact** – Facilitating interactions between decision-makers and researchers
5	**Skills** – Supporting decision-makers to develop skills accessing and making sense of evidence
6	**Structure and Process** – Influencing decision-making structures and processes

1.5.2.1 Awareness

The influence of building awareness and positive attitudes was mainly studied in the wider social science literature, including e.g. psychology and behavioural science, or management studies.

Strong evidence supported social marketing and awareness building campaigns[28]:

- Awareness building campaigns showed to be effective in increasing visibility and credibility of a specific issue. To raise awareness is to inform and educate people about an issue with the intention of influencing their attitudes and behaviors or beliefs towards a defined purpose or goal. Established principles of awareness building, such as to focus on an issue of concern, to use emotions like humor or surprise, or to present narratives can increase audience's attention.
- The value of social marketing and awareness building campaigns for building positive attitudes and creating a new social or professional norm was proven by strong evidence. This new professional norm might be that evidence use is the right thing to do.

  Social marketing is about marketing for social good, not just for profit. It aims to change behaviour, such as encouraging healthy eating habits, and has shown to work in areas such as health, management and social policy, according to the Alliance review. An example is given in the systematic review by McDermott et al (2005).[29] This review showed the effectiveness of social marketing for nutrition and food safety interventions.[29] Further information on the concept of social marketing can be found below (see 1.5.3).

Evidence was found for social incentives and identity cues[28]:

- Social incentives, identity cues and priming showed to reinforce behavioural norms and to support compliance with these norms.

  Social incentives refer to the provision of non-financial incentives to encourage a desired behaviour. Instead of monetary value, the presented reward is of social value. Rewards like prizes for excellence, certificates or public recognition nurture intrinsic motivation, are socially visible and further increase awareness of the desired behaviour.[28]

  Identity cues highlight a person's connection to an existing social identity or norm. Identity cues and priming aim to influence behaviour by highlighting a particular identity or norm that is aligned with the targeted behaviour.[28] An identity cue, which is linked to the professional identity of decision-makers that entails the use of evidence, could be presented to professionals when faced with an important practice decision. This intervention could thereby trigger the evidence use norm and increase awareness and motivation to use evidence.

1.5.2.2 Agree

When researchers (in the context of this report: producers of guidelines or other EBP products) and evidence users (in the context of this report: primary care professionals) share a mutual understanding of what information is needed, the use of evidence in decision making will become more likely. There should be agreement on what questions are relevant, and which kind of evidence is needed to answer these questions.

Several methods of consensus building exist, and evidence was found in the wider social science literature for some methods[28]:

- Delphi panels or other sociological group techniques can be efficient methods to build consensus.
- There was even strong evidence that journal clubs, besides their classical educational aspects, can also support the process of consensus building between researchers and evidence users. By joining a journal club, you can regularly catch up with colleagues to review a research paper.
- There was also evidence that user engagement could have an effect on behaviour change. This means that involving end users into the production of evidence, might have a positive effect on their use of the resulting evidence.

1.5.2.3 Access and Communication

Effective communication is required to make evidence users aware of relevant evidence, and facilitating convenient access is needed to increase their motivation and opportunity to use evidence.

"Tailoring and targeting" was supported by strong evidence from both the medical literature and the social sciences reviews[28]:

- "Give them what they need!" Form and timing of information delivery is crucial. Implying that services tailored to users' personal needs are important, enabling users to read and have access to the sources they want, and when they want (for instance while travelling). Ask your audience how they want their evidence packaged or which format they prefer, and make user-friendly, personalized and tailored messages[g] (e.g. LaRocca et al 2012).[24]
- Online repositories of evidence should be available, but should be accompanied by an intervention aiming at enhancing motivation to use evidence, such as a tailored alerting message or a user-friendly design technique. Passive dissemination, providing access to databases without follow-up, doesn't generate impact.
- Digital services should also allow for spontaneous and spot on queries: chatrooms and telephone services (hotline, this does not have to be a 24-hour turn-around service).

Persuasive communication techniques such as framing, branding and the use of narratives were supported by strong evidence from the wider social science literature[28]:

- Framing of content is crucial: the way you present information can have a dramatic effect on how it is understood. E.g. depending on the content and on your audience, the message can be put or "framed" in a positive or in a negative way. It has to be flexible too, meaning that user's information needs should be taken into account while also respecting the specific vocabulary used for recommandations in guidelines according to the level of evidence.[30-32]
- Storytelling, using narratives and metaphors and putting information in context is another important aspect to get the message across.
- Create a recognisable and respected brand. A positive image is a potent tool for evidence-communication. For busy professionals it might be immensely helpful to find quickly what they need, from a trusted source.
- Regarding 'dealing with uncertainties by users of evidence' the authors stress that information services have to be "balanced" in the sense that numbers and words should be combined in information packages.

Reminders and social media were also supported by strong evidence[28]:

- Support learning with reminders and repetitive services. Many research reviews indicated that this is a simple but effective tool.
- There was ample reliable evidence that using social and online media is an effective communication tool. Implying that digital services as organised by the National EBP Programme should not only cover 'closed communities' but also include the use of social media by primary care professionals (such as @cochranecollab, blogs from users and others).
    - Applying a mix of media seems to be a promising tool for effective communication, although not yet fully backed up by research evidence. An example can be a mix of online evidence portals, with email reminders, etc. The Alliance concluded that not much evidence is available yet on what medium or mix of media works best.

[g] Currently, software is being developed to support the publication of different formats starting from one guideline: the data model applied in MAGICapp breaks down the concept of a guideline document into discrete elements of content. This way of digitally structuring data allows content to be published in multilayered and flexible formats, usable on all devices and facilitates adaptation and dynamic updating of individual recommendations in a living guideline model (http://magicproject.org/; https://www.magicapp.org/)

Evidence was found for the use of information design[28]:

- User experience, making optimal use of "the beauty of information design" and visualisation techniques, is crucial. Digital data visualisation offers a lot of promising services[h]. The Alliance refers to the Norwegian Knowledge Centre for Health Services who use information designers to develop more appealing and user friendly evidence formats.

1.5.2.4 Interact

The Alliance couldn't find evidence of impact in areas such as fostering collaboration, or building relationships and trust e.g. in joint seminars, online communities, or by knowledge brokering[28].

- For instance, one review found a failure to encourage evidence-use amongst 'communities of practice', where professionals can meet and discuss with colleagues and researchers, usually in a virtual forum (La Rocca et al. (2012) [24]). The reason for the lack of impact might be that a sharper definition is needed to describe interventions based on "interaction" as an active component, underpinned by a stronger Theory of Change about what exactly they are trying to achieve. There is nevertheless some evidence from the broader social sciences that online networks using online and mobile technologies are not less effective or persuasive than traditional face-to-face networks: they can have impact on behaviour change, and social influence among their members is possible[28].

Although there was no evidence of impact in areas such as fostering collaboration, or building relationships and trust, there was one exception[28]:

- Opinion leaders, evidence champions, messengers, role models and 'change agents' are important when it comes to changing behaviour. The role of social influence was confirmed in the social sciences and literature by strong evidence. Social influence refers to the ability to spread information and behaviour through personal ties and networks. This relates to the concept of "shared leadership", introduced elsewhere in this report (see SB3).

1.5.2.5 Skills

There was reliable evidence from the medical literature reviews that educational interventions can lead to increased use of evidence. Training seemed even more effective if it was combined with a push to motivate learners to use it. Merely passive educational approaches (such as simple dissemination of knowledge, for instance provision of guidelines) were found to be ineffective[28].

Likewise, there was strong evidence from the wider social science literature that skills and training initiatives are effective[28]:

- Important literature exists on adult education and the best ways to design adult learning. For instance, proven concepts are an equitable relationship between teacher and learner, learning from each other, a coaching style, just-in-time training, avoiding trainings during a very limited number of hours only or in overcrowded classes far away from the office.

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h Or Infographics, see e.g. https://www.cihi.ca/en/infographic-wait-times-for-priority-procedures-in-canada-2017

- Learning via a mentor or supervisor fits also into the principles of adult learning. Mentors are workplace colleagues that are there to help you. They allow a more adult peer-to-peer support, allowing you to apply what you have learnt at your own pace in the work place. Supervisors can also play a role, not just in transferring knowledge but also in providing support and stimulating motivation.
- Online learning also appeared to be effective, and was supported by a large and strong body of review evidence; it might be worthwhile to consider it more often. Reviews on the use of evidence apps are still lacking but might become available in the future as their use continues to grow.
- In addition to the evidence provided by The Alliance, literature on 'technology enhanced learning' (TEL) offers some relevant insights[i]:
    - Core is an online forum for knowledge sharing
    - Similar possibilities as in regular face-to-face meetings should be possible
    - Duration of a communication session needs continuous attention: if the duration is too long, participants will retreat or loose attention
    - Possibility of splitting up in temporary 'break-out rooms', where people discuss a topic in smaller groups
    - Proper infrastructure and support of technology skills is important

[i] A comprehensive source is Goodyear, P. and Carvalho, L. (2014). The architecture of productive learning networks.

1.5.2.6 Structures and processes

Whether evidence is considered by professionals during the decision-making process might depend on factors related to the decision-making itself. Evidence from the broader social sciences field underlined the value of providing practical resources to incorporate research use. These resources could be related to the processes of decision-making, or to the organisational structures in which the professionals operate.

There was evidence for behavioural techniques that aim to reduce cognitive biases:

- A number of well-known biases affect individual decision-making[28], for example: cognitive burden (demands on mental capacity and memory), priors (established beliefs and values), confirmation bias (interpret and filter information to support preconceptions), loss aversion (perceiving losses more strongly than gains). Behavioural techniques such as presenting default options might mitigate effects of cognitive burden, e.g. evidence databases as a PC homepage. Other techniques are framing the evidence use as loss-averting behaviour, highlighting the immediate benefit of using evidence or incorporating evidence into mental shortcuts like checklists or protocols e.g. a protocol for nurses on how to use evidence in pain management.

Interventions like nudges making it more conducive to use evidence also showed effectiveness[28] :

- Nudges proved to have positive effects on the use of evidence. Nudges attempt to point people toward a particular choice by e.g. changing the description, or the reference point. They thereby present a form of gentle persuasion to engage in the desired behaviour. Examples of nudges include feedback, personalised language, social proofs.[28] "League tables" of evidence users might increase individual's motivation, as could information on how many colleagues used evidence in a past assignment. Personalised information or feedback similarly might increase the likelihood that evidence is used. Another

example is restructuring choice architectures to favour evidence use (e.g. changing order of choice presentation). Further information on the concept of nudging can be found below (see 1.5.3.2).

- More specifically, norms and identities also showed to have direct influence on the decision-making process. Behavioural interventions such as nudges use norms and identities to influence cognitive biases, and identity priming and social proof aim to remind of social or professional norms associated with the targeted behaviour change. The distinction between behavioural techniques, social marketing and communication techniques to support the formation of new norms is blurry and effective interventions are likely to combine aspects of each. For example, identity cues and framing are as much applied in nudges as they are in communication as social marketing.
- Behavioural frameworks have been proposed that combine several insights to allow for a more structured application of behavioural principles. An example is the EAST framework presented by the Behavioural Insight Team (UK)[j]. EAST suggests 4 simple ways of applying behavioural insights in intervention design: make it easy (reduce even very small barriers to make the desired behaviour more likely), attractive (create simple and clear messages, or new design features, to attract our limited attention), social (show or tell people that others are performing the desired behaviour), timely (launch interventions at times when people are most receptive to change). More information can be found in the publication by Hallsworth et al (2016).[33]

Effectiveness of facilitation at the level of the organisation was underpinned by strong evidence[28]:

- The implementation of IT systems that support the use of evidence appeared to be strong tools to increase evidence use, e.g. provision of decision support software tools.
- A vast body of evidence on the effectiveness of financial incentives to change professional behaviour was found.
- Providing audit and feedback was consistently found to lead to significant changes in professional behaviour.

1.5.3 Focus on some new concepts emerging from social sciences

A few of the concepts mentioned in 1.5.2 are further clarified in this paragraph since it is felt that this is necessary for a better understanding of their meaning. This does not imply that these implementation strategies proved to have a better effect than or should be preferred above other strategies.

1.5.3.1 Social marketing

Social marketing is the systematic application of commercial marketing concepts and techniques to the analysis, planning, execution, and evaluation of health or social programs.[34] These programs are designed to influence the voluntary behaviour of target audiences in a way that improves their personal health and/or welfare. Social marketing interventions have been shown to change or promote health behaviours on a wide range of health issues such as smoking, binge drinking, and cancer screening.[34] Social marketing interventions intend to remove barriers in order to increase the perceived benefits of changing a certain behaviour.

Four key elements of the marketing mix (4 Ps) are fundamental to social marketing practice:

j www.behaviouralinsights.co.uk

1. Product - the bundle of benefits;
2. Price - reducing the bundle of benefits or costs;
3. Place - delivering the benefits and costs to the right place at the right time;
4. Promotion - informing and persuading the costs and benefits.

Taking these elements into consideration, behaviour change through social marketing involves elements that go beyond education. Social marketing programs attempt to modify the relative attractiveness of specific behavioural options by using incentives and other benefits that positively reinforce the desired behaviour and by reducing the barriers or costs associated with this behaviour.[34]

Like other types of behavioural interventions, social marketing uses behavioural theories to guide program development. The first step in developing a social marketing program is to conduct audience research.[34] Audience research is formative research conducted within the target audience in order to: identify costs and benefits (price) associated with the desired behaviour; develop marketing offers (products) related to the target audience's needs; and identify channels (place) for product delivery. By using attributes of the target audience such as demographics, behaviour, or beliefs/attitudes, segments (smaller, more homogeneous, and meaningful subgroups) are created which can be used to influence program design and outcome. Finally, the product is delivered (promotion) to these segments through selected channels (e.g. mass media). See Figure 7.

Two interesting organizations were mentioned in the Alliance review[28]: the Institute for Social Marketing based at the University of Stirling (UK)[k] , and the National Social Marketing Centre (UK)[l]. The 4Ps model is at the base of their services and research.

More recently, the 4Ps model (Product, Price, Place and Promotion) has been adjusted, and expanded into the 7Ps marketing model[m]. The 7Ps is generally used in the service industries and introduces three other key elements: People, Process, Physical environment.

5. People: the company's employees are important because they are the ones who deliver the service. People who genuinely believe in the products or services that the particular business creates, will perform better.
6. Process: the systems and processes of the organization, e.g. IT or distribution systems, affect the execution of the service and should be well-tailored.
7. Physical environment: in the service industries, there should be physical evidence that the service was delivered. Additionally, physical evidence pertains also to how a business and its products are perceived in the marketplace, e.g. when you think of "fast food", you think of McDonalds.

These three additional concepts can be interesting for social marketing practices as well[n].

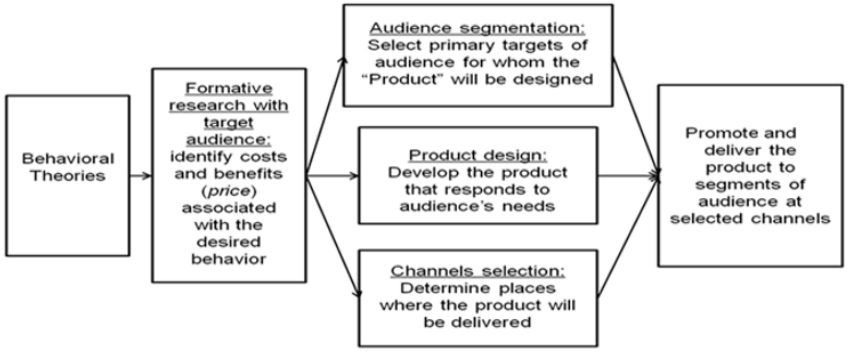
k http://www.stir.ac.uk/health-sciences-sport/research/groups/social-marketing/

l http://www.thensmc.com/

m http://marketingmix.co.uk/

n For further reading on these and other concepts such as 4Cs, see e.g. http://marketingmix.co.uk/

Figure 7 – Development and implementation of a social marketing intervention (Wei et al., 2011)[34]



http://onlinelibrary.wiley.com.gateway.cdlh.be/enhanced/figures/doi/10.1002/14651858.CD009337 - figure-viewer-CD009337-fig-0001

1.5.3.2 Nudging

For several decades already, psychological and behavioural sciences have been studying how behaviour could be changed in predictable ways by changing the environments within which people make choices. The book 'Nudge: Improving decisions about health, wealth and happiness', published by Thaler and Sunstein in 2008, draw a lot of attention in the medical world to the concept of nudging.[35] Thaler and Sunstein stated that there exists a "choice architecture" which involves all of the outside forces that may subtly guide one's decisions in one direction or another, without forbidding any options or significantly changing their economic incentives[o]. It is proposed that interventions of this kind typically require little conscious engagement on the part of the individual to realise their intended effects, mainly working via automatic or non-conscious psychological processes.[36] It is well-known that items placed at eye-level in a supermarket may be selected more frequently than those near the floor. Likewise, changing the size of plates or placing less healthy foods further away from customers in a cafeteria, may influence the amounts and types of food selected and consumed. Increasing the time taken for elevator doors to close may increase the likelihood of people using the stairs instead. Another example is changing the default option to take advantage of people's tendency to accept defaults passively, such as for opt-in/opt-out systems for organ donation. Nudges stand in contrast to traditional policy tools, which change behaviour with mandates or bans or through economic incentives such as subsidies or fines.[37]

This benignly intentioned manipulation has also been labelled as "libertarian paternalism", meant to improve the directions of people's choices while maintaining freedom of choice. There has been some debate about the morality of libertarian paternalism, which some consider to be an infringement of individual freedom of choice.[38] Some compromise might be justified between autonomy and this type of libertarian paternalism when it aims to increase impact of measures to improve health.[39]

1.6 Conclusion

This chapter highlights some important aspects of implementation and implementation science that could be useful in the context of the National EBP Programme. It is based on a limited search only, and does not give a comprehensive overview of existing publications. The results reflect some main principles in implementation science, and can serve as a handle to start implementation interventions in the context of the EBP Plan. This could be completed with more detailed information depending on the needs emerging when the National EBP Programme will be further developed.

Implementation science is a relatively young science. Main insights point to the relevance of evaluating needs as well as determining barriers and facilitators before starting implementation. Three levels (micro-meso-macro) and five core domains should be considered for determinants of implementation success or failure:

[o] The Nobel Prize in Economics 2017 has been awarded to Richard H. Thaler for his work on nudging

- the implementation object itself (e.g. guideline);
- the users/adopters (e.g. health care practitioners), i.e. micro-level;
- the end users (e.g. patients), i.e. micro-level;
- the (broader) context, i.e. meso- and macro-level;
- the strategy of facilitating implementation itself.

There is also a tendency to include insights from social sciences such as psychology, media and communication, management and business marketing to develop implementation interventions. They hold a body of knowledge on areas such as behaviour change, organisational change, learning and motivation.

Current knowledge on implementation principles in the domain of health care has been concisely summarized by Brian Mittman (2014)[40] (See also Brownson et al, 2012)[41]:

- "It was recognized that implementation strategies must be selected on the basis of (1) identified causes of quality and implementation gaps and (2) an assessment of barriers and facilitators to practice change, as well as (3) guided by appropriate behaviour change theory and conceptual models and (4) sensitive to features of the context and settings in which the implementation effort will occur. Furthermore, because most implementation or quality gaps have multiple causes and involve multiple barriers to change, implementation programs must generally include multiple components, each designed to address one or more identified causes of poor quality or barriers to adoption of recommended practices, and each guided by relevant theory from the social and behavioural sciences (…)

  The field's evolution from single-component studies to multicomponent approaches to theory-based and problem-based approaches was relatively slow in part because early studies found multicomponent approaches to be superior to single-component strategies even in the absence of careful selection and matching of components to barriers. In many cases this might have been caused by the simple fact that a multicomponent approach is more likely to successfully address one or more key barriers merely because including more components increases the odds of a fortuitous match to key barriers. Subsequent findings suggesting that multicomponent approaches were not always superior to single-component approaches helped trigger recognition that individual components must be carefully selected. Although only limited evidence is available regarding the benefits of tailoring and directly comparing a randomly selected package of implementation interventions to a package consisting of components explicitly selected to match identified barriers to change, the argument that intentional design of an implementation program based on a thorough diagnosis of observed quality or implementation gaps has considerable face validity and is a feature of key frameworks and published guidance for implementation in health care..."

Evidence is available on which strategies are effective for implementation of clinical practice guidelines. Although significant impact on clinical practice is possible, it should be kept in mind that the effect of these strategies is usually small.

Specific interventions or implementation techniques based on insights from the broader social sciences have recently been considered to ameliorate the use of evidence. Examples are social marketing, behavioural "nudges" or persuasive communication techniques. However, this type of interventions or implementation principles are not (yet) mentioned in existing classifications of implementation strategies in health care, such as the EPOC classification. It might be that the recognition of the importance of such principles has only started recently.

The literature reviews on effectiveness of implementation strategies (section 1.5) were focused on specific implementation interventions or techniques.

However, interventions in delivery arrangements, financial arrangements[p], and governance arrangements (section 1.4) should also be considered for improvement of EBP implementation. It was beyond the scope of this report to study these types of interventions.

Finally, it should be clear that changing practice takes time and considerable effort, and that people tend to resist change. A process of careful information provision and education, persuasion and support should gradually lead to the adoption of new professional insights. This has to improve the likelihood that the innovation (new evidence-based knowledge, technique or approach) will become a standard of care or 'institutionalized'. Policy makers have to be aware that a certain period of time (in terms of years) is needed to change professional behaviour.

From the previous paragraphs, it is clear that the competences needed to select, develop and execute adequate implementation strategies are not the same as the competences needed to develop clinical guidelines or other EBP products. To enhance the implementation of guidelines, it is interesting to include other competencies in the EBP Programme execution. Input from experts with knowledge such as social marketing or persuasive communication techniques should be foreseen right from the start. For instance, social marketing companies target their strategies on the needs of the end user in a very practical and hands on way; in doing so, stimulating change of user behaviour.

1.7 Operational aspects: implementation as part of the EBP Life cycle

1.7.1 Set-up of an implementation platform

As already pointed out in SB2 and S1 on the Governance of the EBP Programme, the NAO will be responsible for the overall management of the processes of the six life cycle phases, including dissemination and implementation. Cells and platforms will be responsible for the coordination of the scientific methods and procedures linked to the specific tasks of each phase: the dissemination platform for dissemination tasks, and an implementation platform for implementation tasks. These two platforms should collaborate intensively, since the specificity of dissemination interventions also influences implementation. Further, reflection on implementation should already start during the development phase of EBP products in order to improve their implementability. Therefore a close collaboration between the development platform and the dissemination and implementation platforms is also important.

Today, implementation activities for EBP guidelines or products are only rarely set up in Belgium (see SB1 section 3.4.3.6). However, improvement of implementation of EBP guidelines and other EBP products is one of the main aims of the national EBP Programme. One of the priorities of the EBP Programme should be to set up an implementation platform. To make this platform a success, input from expert(s) with knowledge such as social marketing or persuasive communication techniques should be foreseen. This type of knowledge can support the process of soft changes (see SB3) aiming at engaging the primary care professionals. Guideline development agencies abroad work already with implementation specialists, e.g. NICE[q], IKNL[r] or NHG[s]. The Belgian implementation platform has to learn from their

[p] E.g. Pay for Quality, the mechanism which directly relates the remuneration of delivered care to the achieved result on structure, process and/or outcome indicators (KCE report 118)

[q] https://www.nice.org.uk/

[r] www.iknl.nl

[s] https://www.nhg.org/

strategies and experiences (KCE report 284, chapter 4.3)[1]. Some additional interesting websites with practical information can be found in appendix 1.5.

Of course, this implementation platform may not be able to provide an answer to all barriers perceived to the implementation of EBP, for instance to barriers in the larger societal context. However, the examples abroad learn that a lot of obstacles can be addressed in a meaningful way with specific actions based on knowledge in this domain.

1.7.2 How to proceed?

- Reflection on implementation should already start during the development phase of EBP products in order to improve their implementability. Therefore a close collaboration between the development platform and the dissemination and implementation platforms is necessary. Taking into account the current state of the science, the GUIDE-M model (see section 1.3.3) should be used as the reference model in the context of the Belgian EBP Programme, and should be included in the procedures of the development phase of the EBP Life cycle. The use of this model might be reconsidered when new evidence comes available.
- A dissemination and implementation plan is necessary and should be developed for each guideline or EBP product that is elaborated in the context of the EBP Programme. This should be the core task of the dissemination and implementation platforms. Ideally, as explained in 1.6, this should start from an evaluation of the needs, barriers, facilitators and change readiness.
- This dissemination and implementation plan should take existing initiatives outside the EBP Programme into account, e.g. the new system of continuous professional education currently being developed (see S1). The incorporation of EBP in the system of continuous professional education of all health care professionals should be foreseen, e.g. stimulation to offer EBP guidelines or products in the program.
- One of the options to improve dissemination, is the development of different formats that take into account the preferred presentation of the different groups of EBP product users. The use of recently developed software tools, e.g. the open source software MAGICapp[t], can help to produce easily different formats from one guideline document. The dissemination platform should play a coordinating role by providing support and spreading knowledge on how to create, present and disseminate these different formats.
- The process of implementation of the current EBP Plan aims to improve EBP adherence among primary health care professionals and practices[u]. Ultimately change processes have to take place at the level of the primary health care professionals themselves. While hard change principles are necessary to set the overall direction and the goals for the EBP Programme, soft change principles are appropriate to engage the professionals (see SB3). Creating (multidisciplinary) networks of primary health care professionals could be a way to support the change processes. These expert networks should be facilitated by the NAO, and can be seen as dynamic groups of professionals who engage more or less actively around specific themes, based on temporary activities they have interest in.
- Scientific organisations and the “huisartsenkringen/ cercles de médecins » should be involved right from the start of the guideline development. Because of their direct connections with the health care professionals, they can play a crucial role in dissemination as well as

t https://www.magicapp.org/

u implementation in secondary and tertiary health care will be considered after evaluation of the implementation of this EBP Programme in primary health care,

implementation of EBP products. The NAO should facilitate their participation.

- For physicians, participation in continued education through a LOK (lokale kwaliteitsgroep) or GLEM (groupe local d'évaluation médicale) is required if the context of the accreditation system of the national health insurance system (RIZIV/INAMI) stays the same. These LOKs and GLEMs could also become a central partner when it comes to improve dissemination and implementation of EBP products. Other existing initiatives of continuous education, e.g. through e-learning or journals should also be invited to collaborate. For other professional groups, similar educational initiatives, linked or not to accreditation, begin to develop. Again, the NAO should stimulate this type of collaboration and partnership.
- The role of EBMPracticeNet as a central dissemination channel for EBP in Belgium should be confirmed and reinforced. An ongoing project hosted at the Federal Public Service Health, Food chain safety and Environment already aims at broadening access to EBMPracticeNet to 10 primary care professions. Through further development of this IT platform, other powerful dissemination and implementation tools should become available. Examples are "Evidence Linker": a pull system in which the validated guidelines on EBMPracticeNet can be consulted directly from the electronic patient file; or decision support systems that are "pushed" with alerts and reminders. Of course, a "conditio sine qua non" is that the eHealth system and the electronic patient files function well. Tools like "Evidence Linker" or decision support systems should become available not only for GPs, but also for other health care professionals. Investments in IT should systematically be planned and foreseen in the overall strategic planning of the EBP Programme.
- Finally, the educational system should remain conscious of their important role in creating awareness for as well as teaching competences in the use of EBP. All future health care professionals e.g. medical students, future nurses, manual therapists or speech therapists etc. should receive adequate teaching in this domain. They should also become partners in the programme for further health care quality improvement through EBP.

APPENDICES

Appendix 1.

Appendix 1.1. EPOC Taxonomy of health systems interventions

From: Effective Practice and Organisation of Care (EPOC). EPOC Taxonomy; 2015. Available at: https://epoc.cochrane.org/epoc-taxonomy

Table 4 – Main domains of the EPOC taxonomy of health systems interventions

Category	Definition
Implementation strategies	Interventions designed to bring about changes in healthcare organizations, the behaviour of healthcare professionals or the use of health services by healthcare recipients
Delivery arrangements	Changes in how, when and where healthcare is organized and delivered, and who delivers healthcare
Financial arrangements	Changes in how funds are collected, insurance schemes, how services are purchased, and the use of targeted financial incentives or disincentives
Governance arrangements	Rules or processes that affect the way in which powers are exercised, particularly with regard to authority, accountability, openness, participation, and coherence

Table 5 – EPOC Taxonomy – topics list

Implementation Strategies **Interventions designed to bring about changes in health care organizations, the behaviour of health care professionals or the use of health services by health care recipients**	
Category: **Interventions targeted at health care organisations**	
Subcategory	**Definition**
Organisational culture	Strategies to change organisational culture
Category: **Interventions targeted at health care workers**	
Subcategory	**Definition**
Audit and feedback	A summary of health workers' performance over a specified period of time, given to them in a written,
	electronic or verbal format. The summary may include recommendations for clinical action.
Clinical incident reporting	System for reporting critical incidents,
Monitoring the performance of the delivery of health care	Monitoring of health services by individuals or health care organisations, for example by comparing with an external standard.
Communities of practice	Groups of people with a common interest who deepen their knowledge and expertise in this area by interacting on an ongoing basis
Continuous quality improvement	An iterative process to review and improve care that includes involvement of health care teams, analysis of a process or system, a structured process improvement method or problem solving approach, and use of data analysis to assess changes
Educational games	The use of games as an educational strategy to improve standards of care.
Educational materials	Distribution to individuals, or groups, of educational materials to support clinical care, i.e., any intervention in which knowledge is distributed. For example this may be facilitated by the internet, learning critical appraisal skills; skills for electronic retrieval of information, diagnostic formulation; question formulation
Educational meetings	Courses, workshops, conferences or other educational meetings
Educational outreach visits, or academic detailing.	Personal visits by a trained person to health workers in their own settings, to provide information with the aim of changing practice.
Clinical Practice Guidelines	Clinical guidelines are systematically developed statements to assist health care providers and patients to decide on appropriate health care for specific clinical circumstances'(US IOM).
Inter-professional education	Continuing education for health professionals that involves more than one profession in joint, interactive learning

Local consensus processes	Formal or informal local consensus processes, for example agreeing a clinical protocol to manage a patient group, adapting a guideline for a local health system or promoting the implementation of guidelines.
Local opinion leaders	The identification and use of identifiable local opinion leaders to promote good clinical practice.
Managerial supervision	Routine supervision visits by health staff.
Patient-mediated interventions	Any intervention aimed at changing the performance of health care professionals through interactions with patients, or information provided by or to patients.
Public release of performance data	Informing the public about health care providers by the release of performance data in written or electronic form.
Reminders	Manual or computerised interventions that prompt health workers to perform an action during a consultation with a patient, for example computer decision support systems.
Routine patient-reported outcome measures	Routine administration and reporting of patient- reported outcome measures to providers and/or patients
Tailored interventions	Interventions to change practice that are selected based on an assessment of barriers to change, for example through interviews or surveys.
Category: **Interventions targeted at specific types of practice, conditions or settings**	
Health conditions	Acute stroke Acute surgery Alcohol
Practice and setting	Health promotion in dental settings

Delivery Arrangements **Changes in how, when and where health care is organized and delivered, and who delivers health care.**	
Category: **How and when care is delivered**	
Subcategory	**Definition**
Group versus individual care	Comparisons of providing care to groups versus individual patients, for example intensive group therapy, group vs individual antenatal care.
Queuing strategies	A reduction or increase in time to access a health care intervention, for example managed waiting lists, managing ER wait time.
Coordination of care amongst different provider	Organizing different providers and services to ensure timely and efficient delivery of health care.

Quality and safety systems	Essential standards for quality of health care, and reduction of poor outcomes related to unsafe health care.
Triage	Management of patients attending a health care facility, or contacting a health care professional by phone, and receiving advice or being referral to an appropriate service
Category: **Where care is provided and changes to the health care environment**	
Subcategory	**Definition**
Environment	Changes to the physical or sensory health care environment, by adding or altering equipment or layout, providing music, art.
Outreach services	Visits by health workers to different locations, for example involving specialists, generalists, mobile units
Site of service delivery	Changes in where care is provided, for example home vs. health care facility, inpatient vs outpatient, specialized vs. non-specialized facility, walk in clinics, medical day hospital, mobile units
Size of organizations	Increasing or decreasing the size of health service provider units
Transportation services	Arrangements for transporting patients from one site to another
Category: **Who provides care and how the health care workforce is managed** Changes in who provides care, to include the qualifications of who provides care; and the recruitment, distribution and retention of health workers	
Subcategory	**Definition**
Role expansion or task shifting	Expanding tasks undertaken by a cadre of health workers or shifting tasks from one cadre to another, to include tasks not previously part of their scope of practice.
Self-management	Shifting or promoting the responsibility for health care or disease management to the patient and/or their family.
Length of consultation	Changes in the length of consultations
Staffing models	Interventions to achieve an appropriate level and mix of staff, recruitment and retention of staff, and transitioning of health care workers from one environment to another, for example interventions to increase the proportion of health care workers in underserved areas.
Exit interviews	A verbal exchange or written questionnaire between employees' resignation and last working day
Movement of health workers between public and private care	Strategies for managing the movement of health workers between public and private organizations
Pre-licensure education	Changes in pre-licensure education of health professionals
Recruitment and retention strategies for underserved areas	Strategies for recruiting and retaining health workers in underserved areas

Recruitment and retention strategies for district health managers - LMIC	Interventions for hiring, retaining and training district health systems managers in LMIC
Category: **Coordination of care and management of care processes** Changes in how health workers interact with each other or patients to ensure timely and efficient delivery of health care.	
Subcategory	**Definition**
Care pathways	Aim to link evidence to practice for specific health conditions and local arrangements for delivering care.
Case management	Introduction, modification or removal of strategies to improve the coordination and continuity of delivery of services i.e. improving the management of one “case” (patient)
Communication between providers	Systems or strategies for improving the communication between health care providers, for example systems to improve immunization coverage in LMIC
Comprehensive geriatric assessment	A multidimensional interdisciplinary diagnostic process focused on determining a frail older person’s medical, psychological and functional capability to ensure that problems are identified, quantified and managed appropriately
Continuity of care	Interventions to reduce fragmented care and undesirable consequences of fragmented care, for example by ensuring the responsibility of care is passed from one facility to another so the patient perceives their needs and circumstances are known to the provider.
Discharge planning	An individualized plan of discharge to facilitate the transfer of a patient from hospital to a post-discharge setting.
Disease management	Programs designed to manage or prevent a chronic condition using a systematic approach to care and potentially employing multiple ways of influencing patients, providers or the process of care
Integration	Consolidating the provision of different health care services to one (or simply fewer) facilities.
Packages of care	Introduction, modification, or removal of packages of services designed to be implemented together for a particular diagnosis/disease, e.g. tuberculosis management guidelines, newborn care protocols.
Patient-initiated appointment systems	Systems that enable patients to make urgent appointments when they feel they cannot manage their condition or where something has changed unexpectedly
Procurement and distribution of supplies	Systems for procuring and distributing drugs or other supplies
Referral systems	Systems for managing referrals of patients between health care providers
Shared care	Continuing collaborative clinical care between primary and specialist care physicians
Shared decision-making	Sharing health care decision making responsibilities among different individuals, potentially including the patient.
Teams	Creating and delivering care through a multidisciplinary team of health care workers.
Transition of Care	Interventions to improve transition from one care provider to another, for example adolescents moving from child to adult health services.

Category: Information and communication technology (ICT) **ICT used by health care organizations to manage the delivery of health care, and to deliver health care**	
Subcategory	**Definition**
Health information systems	Health record and health management systems to store and manage patient health information, for example electronic patient records, or systems for recalling patients for follow-up or prevention e.g., immunization.
The use of information and communication technology	Technology based methods to transfer health care information and support the delivery of care.
Smart home technologies	Electronic assistive technologies
Telemedicine	Exchange of health care information from one site to another via electronic communication

Financial Arrangements **Changes in how funds are collected, insurance schemes, how services are purchased, and the use of targeted financial incentives or disincentives**	
Category: Collection of funds Mechanisms by which financial resources to pay for health care are obtained	
Subcategory	**Definition**
User fees or out of pocket payments	Charges levied on any aspect of health services at the point of delivery
Caps and co-payments for drugs of health services	Direct patient payments for part of the cost of drugs or health services
Prepaid funding	Collection of funds through general tax revenues versus earmarked tax revenues versus employer payments versus direct payments
Community loan funds	Funds generated from contributions of community members that families can borrow to pay for emergency transportation and hospital costs
Health savings accounts	Prepayment schemes for individuals or families without risk pooling
External funding	Financial contributions such as donations, loans, etc. from public or private entities from outside the national or local health financing system
Category: Insurance schemes Risk pooling to cover all or part of the costs of health care services	
Subcategory	**Definition**

Social health insurance	Compulsory insurance that aims to provide universal coverage
Community based health insurance	A scheme managed and operated by an organization, other than a government or private for-profit company, that provides risk pooling to cover all or part of the costs of health care services
Private health insurance	Private for-profit health insurance
Category: **Mechanisms for the payment of health services** NB Pay for Performance mentioned in more than one category	
Subcategory	**Definition**
Method of paying health care organisations	Global budgets, employer based insurance schemes, line- item budgets; case-based reimbursement; pay for performance; mixed payment
Payment methods for health workers	Fee for services, capitation, salary
Contracting out health services	Contracting is a strategy to use public sector funds to finance the provision of health care services.
Voucher schemes	Provision of vouchers that can be redeemed for health
	services at specified facilities
Conditional cash transfers	Monetary transfers to households on the condition that they comply with pre-defined requirements for health care
Pricing and purchasing policies	Policies that determine the price that is paid or how commercial products are purchased, for example health technologies, drugs.
Category: **Targeted financial incentives for health professionals and health care organisations.** NB Pay for Performance is mentioned in more than one category	
Subcategory	**Definition**
Pay for performance – target payments	Transfer of money or material goods to health care providers conditional on taking a measurable action or achieving a predetermined performance target, for example incentives for lay health workers.
Fund holding	Budgets allocated to a group or individual providers to purchase services with financial rewards for underspending or penalties for overspending (includes indicative budgets)
Incentives for career choices	Financial or material rewards for career choices; e.g. choice of profession or primary care

Governance Arrangements Rules or processes that affect the way in which powers are exercised, particularly with regard to authority, accountability, openness, participation, and coherence	
Category: **Authority and accountability for health policies**	
Subcategory	**Definition**
Decentralisation and centralisation	Decentralised versus centralised authority for health services. For example government regulation of health insurance; regional vs. national management of health budgets on efficiency and effectiveness of health care.
Stakeholder involvement in policy decisions	Policies and procedures for involving stakeholders in decision-making
Community mobilization	Processes that enable people to organize themselves
Patients' rights	Policies that regulate patients' rights, including access to care and information (includes regulation of information provided to patients)
Stewardship of private health services	Policies that regulate health services provided by the private sector
Decision-making about what or who is covered	Processes for deciding what is reimbursed and who is covered by health insurance Policies that regulate what drugs are reimbursed Policies that regulate what services are reimbursed Restrictions on reimbursement for health insurance Strategies for expanding health insurance coverage
Policies to reduce corruption	Regulations that are intended to reduce corruption in the health sector
Policies to manage absenteeism	Regulations for managing absenteeism
Category: **Authority and accountability for organisations**	
Subcategory	**Definition**
Ownership	Policies that regulate who can own health service organizations, for example for-profit vs not-for-profit; public vs private
Insurance	Policies that regulate the provision of insurance, for example insurance coverage of essential drugs
Accreditation	Processes for accrediting health care providers
Multi-institutional arrangements	Policies for how multiple organizations work together Policies that regulate interactions between donors and governments Social Franchising Governance arrangements for coordinating care across multiple providers Mergers

	Collaborations between local health and local government agencies for health improvement
Liability of health care organisations	Policies that limit liability of health care organisations, for example risk management.
Category: **Authority and accountability for commercial products**	
Subcategory	**Definition**
Registration	Procedures for registering or licensing commercial products, for example medical devices, drugs.
Patents and profits	Policies that regulate patents and profits, for example medical devices, drugs.
Marketing regulations	Policies that regulate marketing of commercial products, for example medical devices, drugs, the private provision of health care.
Sales and dispensing	Policies that regulate sales and dispensing of commercial products, for example over the counter and prescription drugs.
Liability for commercial products	Policies that regulate liability for commercial products
Category: **Authority and accountability for health professionals**	
Subcategory	**Definition**
Training and licensing	Policies that regulate training, specialty certification and licensure requirements for health professionals
Prescribing	Selection of a drug, by a suitably qualified health care worker, to treat a patient's health condition.
Scope of practice	Policies that regulate what health professionals can do
Emigration and immigration policies	Policies that regulate emigration and immigration of health professionals
Dual practice	Policies that regulate dual practice, e.g., working in public and privately owned health care settings

Appendix 1.2. GIRAnet Revised taxonomy of guideline implementation strategies

Revised taxonomy of guideline implementation strategies by the GIRAnet network (Guideline Implementability Research and Application Network)[v].

This taxonomy was generated from a scoping systematic review of 32 studies published from 2004 to 2013 that evaluated the implementation of guidelines on arthritis, diabetes, colorectal cancer and heart failure. Interventions they used were mapped against an existing taxonomy of guideline implementation strategies to create this expanded version. Individuals can refer to the options in this taxonomy when planning guideline implementation.

Table 6 – GIRAnet network Revised taxonomy of guideline implementation strategies

Approach	Strategy*
Professional	Identify barriers
	Distribute guideline material
	Advertise guideline material
	Present guideline materials at meetings
	Educate individuals about guideline intent/benefits
	Educate groups about guideline intent/benefits
	Recruit an opinion leader who recommends implementation
	Achieve consensus that guideline should be implemented
	Provide reminders to individuals/groups about intent/benefits
	Provide alerts when practice deviates
	Provide feedback on compliance
	Provide feedback about patients (outcome data, self-report)
	Provide feedback from patients
	Provide feedback from healthcare professionals
	Print material (summary, algorithm, referral forms, etc.)
	Tailor guideline
	Enable self-audit (training, material)
Patient or Consumer	*Education (single or group)*
	Counselling
	Group interaction (via social media)
	Print material (summary, etc.)
	Reminder
Financial - Health Professional	Incentive (individual financial reward or benefit for compliance)
	Incentive (group or institutional financial reward or benefit)
	Grant or allowance to individual (not tied to compliance)
	Grant or allowance to group/institution (not tied to compliance)
	Penalty (individual, for non-compliance)
	Penalty (group/institution, for non-compliance)
	Change in reimbursement (add/remove/substitute)
Financial - Patient	Incentive (individual financial reward/benefit for compliance)
	Grant or allowance (not tied to compliance)
	Penalty (for non-compliance)
	Incentive (individual non-financial reward/benefit for compliance)

[v] http://www.g-i-n.net/working-groups/implementation, accessed 25/08/2017

Approach	Strategy*
Organizational (Health Professional)	Additional human resources (number/type)
	Reallocated or new role
	Create an implementation/multidisciplinary team
	Communication between distant health professionals
	Improve health professional satisfaction (non-financial)
Organizational (Patient)	Consumer participation in governance
	Consumer feedback, suggestions, complaints
Organizational (Structural Changes)	Organizational structure (including reorganization)
	Setting/site of service delivery
	Physical structure, facilities or equipment
	Information/communication technology
	Quality improvement, performance measurement system
	Method of service delivery
	Integration of services
	Risk management provisions (including insurance coverage)
Regulatory	Legislation or regulation (which enforces or mandates)
	Ownership or affiliation
	Licensing, credentialing or accreditation

* definitions for/examples of strategies included in Additional file of original taxonomy publication: Mazza D, Bairstow P, Buchan H, Chakraborty SP, Van Hecke O, Grech C, Kunnamo I. Refining a taxonomy for guideline implementation: results of an exercise in abstract classification. Implement Sci. 2013 Mar 15;8:32.

Italicized items represent unique items that emerged from this study:

Gagliardi AR, Alhabib S and members of the Guidelines International Network Implementation Working Group. Trends in guideline implementation: a scoping systematic review. Implement Sci 2015;10:54.

Appendix 1.3. Compilation of implementation strategy terms and definitions: the ERIC project

From: Powell BJ, Waltz TJ, Chinman MJ, Damschroder LJ, Smith JL, Matthieu MM, Proctor EK, Kirchner JE. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implement Sci. 2015 Feb 12;10:21. doi: 10.1186/s13012-015-0209-1

Number of implementation strategies described: 73.

Table 7 – The Expert Recommendations for Implementing Change (ERIC) discrete implementation strategy compilation

Strategy	Definitions
Access new funding	Access new or existing money to facilitate the implementation
Alter incentive/allowance structures	Work to incentivize the adoption and implementation of the clinical innovation
Alter patient/consumer fees	Create fee structures where patients/consumers pay less for preferred treatments (the clinical innovation) and more for less-preferred treatments
Assess for readiness and identify barriers and facilitators	Assess various aspects of an organization to determine its degree of readiness to implement, barriers that may impede implementation, and strengths that can be used in the implementation effort
Audit and provide feedback	Collect and summarize clinical performance data over a specified time period and give it to clinicians and administrators to monitor, evaluate, and modify provider behavior
Build a coalition	Recruit and cultivate relationships with partners in the implementation effort
Capture and share local knowledge	Capture local knowledge from implementation sites on how implementers and clinicians made something work in their setting and then share it with other sites
Centralize technical assistance	Develop and use a centralized system to deliver technical assistance focused on implementation issues
Change accreditation or membership requirements	Strive to alter accreditation standards so that they require or encourage use of the clinical innovation. Work to alter membership organization requirements so that those who want to affiliate with the organization are encouraged or required to use the clinical innovation
Change liability laws	Participate in liability reform efforts that make clinicians more willing to deliver the clinical innovation
Change physical structure and equipment	Evaluate current configurations and adapt, as needed, the physical structure and/or equipment (*e.g.*, changing the layout of a room, adding equipment) to best accommodate the targeted innovation
Change record systems	Change records systems to allow better assessment of implementation or clinical outcomes
Change service sites	Change the location of clinical service sites to increase access
Conduct cyclical small tests of change	Implement changes in a cyclical fashion using small tests of change before taking changes system-wide. Tests of change benefit from systematic measurement, and results of the tests of change are studied for insights on how to do better. This process continues serially over time, and refinement is added with each cycle

Conduct educational meetings	Hold meetings targeted toward different stakeholder groups (*e.g.*, providers, administrators, other organizational stakeholders, and community, patient/consumer, and family stakeholders) to teach them about the clinical innovation
Conduct educational outreach visits	Have a trained person meet with providers in their practice settings to educate providers about the clinical innovation with the intent of changing the provider's practice
Conduct local consensus discussions	Include local providers and other stakeholders in discussions that address whether the chosen problem is important and whether the clinical innovation to address it is appropriate
Conduct local needs assessment	Collect and analyze data related to the need for the innovation
Conduct ongoing training	Plan for and conduct training in the clinical innovation in an ongoing way
Create a learning collaborative	Facilitate the formation of groups of providers or provider organizations and foster a collaborative learning environment to improve implementation of the clinical innovation
Create new clinical teams	Change who serves on the clinical team, adding different disciplines and different skills to make it more likely that the clinical innovation is delivered (or is more successfully delivered)
Create or change credentialing and/or licensure standards	Create an organization that certifies clinicians in the innovation or encourage an existing organization to do so. Change governmental professional certification or licensure requirements to include delivering the innovation. Work to alter continuing education requirements to shape professional practice toward the innovation
Develop a formal implementation blueprint	Develop a formal implementation blueprint that includes all goals and strategies. The blueprint should include the following: 1) aim/purpose of the implementation; 2) scope of the change (*e.g.*, what organizational units are affected); 3) timeframe and milestones; and 4) appropriate performance/progress measures. Use and update this plan to guide the implementation effort over time
Develop academic partnerships	Partner with a university or academic unit for the purposes of shared training and bringing research skills to an implementation project
Develop an implementation glossary	Develop and distribute a list of terms describing the innovation, implementation, and stakeholders in the organizational change

Develop and implement tools for quality monitoring	Develop, test, and introduce into quality-monitoring systems the right input—the appropriate language, protocols, algorithms, standards, and measures (of processes, patient/consumer outcomes, and implementation outcomes) that are often specific to the innovation being implemented
Develop and organize quality monitoring systems	Develop and organize systems and procedures that monitor clinical processes and/or outcomes for the purpose of quality assurance and improvement
Develop disincentives	Provide financial disincentives for failure to implement or use the clinical innovations
Develop educational materials	Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about the innovation and for clinicians to learn how to deliver the clinical innovation
Develop resource sharing agreements	Develop partnerships with organizations that have resources needed to implement the innovation
Distribute educational materials	Distribute educational materials (including guidelines, manuals, and toolkits) in person, by mail, and/or electronically
Facilitate relay of clinical data to providers	Provide as close to real-time data as possible about key measures of process/outcomes using integrated modes/channels of communication in a way that promotes use of the targeted innovation
Facilitation	A process of interactive problem solving and support that occurs in a context of a recognized need for improvement and a supportive interpersonal relationship
Fund and contract for the clinical innovation	Governments and other payers of services issue requests for proposals to deliver the innovation, use contracting processes to motivate providers to deliver the clinical innovation, and develop new funding formulas that make it more likely that providers will deliver the innovation
Identify and prepare champions	Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in an organization
Identify early adopters	Identify early adopters at the local site to learn from their experiences with the practice innovation
Increase demand	Attempt to influence the market for the clinical innovation to increase competition intensity and to increase the maturity of the market for the clinical innovation

Inform local opinion leaders	Inform providers identified by colleagues as opinion leaders or "educationally influential" about the clinical innovation in the hopes that they will influence colleagues to adopt it
Intervene with patients/consumers to enhance uptake and adherence	Develop strategies with patients to encourage and problem solve around adherence
Involve executive boards	Involve existing governing structures (*e.g.*, boards of directors, medical staff boards of governance) in the implementation effort, including the review of data on implementation processes
Involve patients/consumers and family members	Engage or include patients/consumers and families in the implementation effort
Make billing easier	Make it easier to bill for the clinical innovation
Make training dynamic	Vary the information delivery methods to cater to different learning styles and work contexts, and shape the training in the innovation to be interactive
Mandate change	Have leadership declare the priority of the innovation and their determination to have it implemented
Model and simulate change	Model or simulate the change that will be implemented prior to implementation
Obtain and use patients/consumers and family feedback	Develop strategies to increase patient/consumer and family feedback on the implementation effort
Obtain formal commitments	Obtain written commitments from key partners that state what they will do to implement the innovation
Organize clinician implementation team meetings	Develop and support teams of clinicians who are implementing the innovation and give them protected time to reflect on the implementation effort, share lessons learned, and support one another's learning
Place innovation on fee for service lists/formularies	Work to place the clinical innovation on lists of actions for which providers can be reimbursed (*e.g.*, a drug is placed on a formulary, a procedure is now reimbursable)
Prepare patients/consumers to be active participants	Prepare patients/consumers to be active in their care, to ask questions, and specifically to inquire about care guidelines, the evidence behind clinical decisions, or about available evidence-supported treatments

Promote adaptability	Identify the ways a clinical innovation can be tailored to meet local needs and clarify which elements of the innovation must be maintained to preserve fidelity
Promote network weaving	Identify and build on existing high-quality working relationships and networks within and outside the organization, organizational units, teams, etc. to promote information sharing, collaborative problem-solving, and a shared vision/goal related to implementing the innovation
Provide clinical supervision	Provide clinicians with ongoing supervision focusing on the innovation. Provide training for clinical supervisors who will supervise clinicians who provide the innovation
Provide local technical assistance	Develop and use a system to deliver technical assistance focused on implementation issues using local personnel
Provide ongoing consultation	Provide ongoing consultation with one or more experts in the strategies used to support implementing the innovation
Purposely reexamine the implementation	Monitor progress and adjust clinical practices and implementation strategies to continuously improve the quality of care
Recruit, designate, and train for leadership	Recruit, designate, and train leaders for the change effort
Remind clinicians	Develop reminder systems designed to help clinicians to recall information and/or prompt them to use the clinical innovation
Revise professional roles	Shift and revise roles among professionals who provide care, and redesign job characteristics
Shadow other experts	Provide ways for key individuals to directly observe experienced people engage with or use the targeted practice change/innovation
Stage implementation scale up	Phase implementation efforts by starting with small pilots or demonstration projects and gradually move to a system wide rollout
Start a dissemination organization	Identify or start a separate organization that is responsible for disseminating the clinical innovation. It could be a for-profit or non-profit organization
Tailor strategies	Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection

Use advisory boards and workgroups	Create and engage a formal group of multiple kinds of stakeholders to provide input and advice on implementation efforts and to elicit recommendations for improvements
Use an implementation advisor	Seek guidance from experts in implementation
Use capitated payments	Pay providers or care systems a set amount per patient/consumer for delivering clinical care
Use data experts	Involve, hire, and/or consult experts to inform management on the use of data generated by implementation efforts
Use data warehousing techniques	Integrate clinical records across facilities and organizations to facilitate implementation across systems
Use mass media	Use media to reach large numbers of people to spread the word about the clinical innovation
Use other payment schemes	Introduce payment approaches (in a catch-all category)
Use train-the-trainer strategies	Train designated clinicians or organizations to train others in the clinical innovation
Visit other sites	Visit sites where a similar implementation effort has been considered successful
Work with educational institutions	Encourage educational institutions to train clinicians in the innovation

Appendix 1.4. Effectiveness of implementation strategies: comparison between various sources of evidence

Table 8 – Overview of conclusions of various meta-analyses on the certainty and effectiveness of various intervention strategies for EBP implementation (pronounced results highlighted)

Intervention strategies	Fretheim et al. (2015) – Certainty of adherence	KCE (2012) – Practice outcomes	KCE (2012) – Patient outcomes	KCE (2012) – Other conclusions
Clinical decision-support systems (including reminders)	**Moderate certainty** that this will increase adherence to clinical practice guidelines	Reminders lead to **small improvements**	Reminders lead to **small improvements**	The **effect** of reminders is **more pronounced in a single intervention** compared to its effect as component of a multifaceted intervention
Educational outreach visits (including practice facilitation)	**Moderate certainty** that this will increase adherence to clinical practice guidelines	**Small improvements**	**Only a few studies report slam improvements**	Effect is **more pronounced in continuous practice outcomes**
Audit and feedback	**Moderate certainty** that this will increase adherence to clinical practice guidelines	**Small improvements**	**Minimal discernible effect** in dichotomous outcomes **Small positive effect** in continuous outcomes	A **larger effect** is obtained when audit and feedback are **core components of a multifaceted intervention**
Local opinion leaders	**Moderate certainty** that this will increase adherence to clinical practice guidelines	**Overall positive effect but variation** within and across studies	Not reported	**Similar** improvements found in **single and multifaceted interventions**
Tailored interventions	**Moderate certainty** that this will increase adherence to clinical practice guidelines	--	--	--
Educational meetings	**Moderate certainty** that this will increase adherence to clinical practice guidelines	**Small improvements**	**Small improvements**	Effects similar to other types of continuing medical educations (such as audit and feedback or educational outreach visits).
Internet-based learning	**Very low certainty** that this will increase adherence to clinical practice guidelines	--	--	--
Interprofessional education	**Very low certainty** that this will increase adherence to clinical practice guidelines	**Small improvements**	**Small improvements**	Effect is **more pronounced in multifaceted interventions**
Distribution of printed educational materials	**Very low certainty** that this will increase adherence to clinical practice guidelines	A **small beneficial effect** but with unknown clinical significance	Range from **small negative effect to no differences**	No data on effectiveness of multifaceted interventions

Distribution of electronic educational materials	--	**No effect**	**No effect**	**No difference between single and multifaceted interventions**
Economic incentives	**Very low certainty** that this will increase adherence to clinical practice guidelines	--	--	--
Interprofessional collaboration	**Very low certainty** that this will increase adherence to clinical practice guidelines	--	--	--
Checklists	**Very low certainty** that this will increase adherence to clinical practice guidelines	--	--	--
Strategies to change organisational culture	**Very low certainty** that this will increase adherence to clinical practice guidelines	--	--	--
Public release of performance data	**Very low certainty** that this will increase adherence to clinical practice guidelines	--	--	--
Practitioner selection				
Multifaceted interventions in EPOC interventions	--	**Multifaceted interventions are more effective** than single interventions	Not reported	No data on effectiveness of printed educational materials in multifaceted interventions, reminders as single intervention more effective than in multifaceted intervention
Multifaceted interventions for specific health professionals	--	**Multifaceted interventions are more effective** than single interventions	Not reported	One review found no difference between single and multifaceted interventions for allied health professionals

Table 9 – Definition of the reviewed interventions strategies

Intervention strategies	Fretheim et al. (2015) (translated from Norwegian into English via Google Translate)	KCE (2012)
Clinical decision-support systems (including reminders)	Clinical decision-support systems: computer systems that generate recommendations or reminders to health care professionals, based on information about the individual patient. Reminders on screen: reminders that appear on PC screen during patient consultations.	Reminders can be considered as an educational material adapted to the individual patient's encounter. The EPOC taxonomy classifies them in an apart category defined as "Patient or encounter specific information, provided verbally, on paper or on a computer screen, which is designed or intended to prompt a health professional to recall information". (See http://epoc.cochrane.org/epoc-methods).
Educational outreach visits (including practice facilitation)	Personal visit to health care professionals at their workplace, performed by the trained person. The purpose Is an improvement in practice. The information offered may include feedback from the health care staff practice.	The Cochrane review on this topic (O'Brien 2007) defines educational outreach visits (EOV) as "a trained person from outside the practice setting who meets with health care professionals in their practice settings to provide information with the intent of changing their performance. The information given may include feedback about their performance. The intervention may be tailored based upon previously identified barriers to change. The person delivering the EOV may be from the same organisation, if it is a multi-site organisation, but not from the same practice site." Educational outreach visits are also referred as "university-based educational detailing", "academic detailing", "practice facilitation" and "educational visiting".
Audit and feedback	A review of health personnel practice (e.g., prescribing pattern) over a given period, presented in writing, electronically or verbally.	The Cochrane review from Ivers (2012) defines audit and feedback as "any summary of the clinical performance of health care provider(s) over a specified period of time". Audit and feedback (A&F), also known as "clinical performance feedback", may include recommendations for clinical action and may be delivered in a written, electronic or verbal format.
Local opinion leaders	Identification and use of local opinion leaders to promote introduction of guidelines.	The Cochrane review from Flodgren (2011) mainly cites the work of Rogers to define an opinion leader (Rogers 1995): "an individual who is able to influence other individuals' attitudes or overt behaviour informally, in a desired way with relative frequency, and who are at the centre of interpersonal communication networks". The underlying theories are developed in the review.
Tailored interventions	Measures to improve practice is selected based on an assessment of what are likely barriers for change.	--
Educational meetings	Lectures, seminars, workshops, and courses.	The Cochrane review from Forsetlund (2012) defines educational meetings and workshops as follows: educational meetings may include courses and workshops in various formats, with interactive or didactic (lecture-based) sessions. Interprofessional education is classified in this report under the category of educational meetings.
Internet-based learning	Dissemination of clinical recommendations in electronic format. The material is usually distributed via email or published on web pages.	--

Interprofessional education	Completion of courses and other types of teaching plans for several professional groups together	In the updated version of a previous Cochrane review (Reeves 2009, previous review of Zwarenstein 2000), interprofessional education is defined as any type of educational, training, teaching or learning session in which two or more health and social care professions are learning interactively to improve interprofessional collaboration and/or health/well-being of patients/clients.
Distribution of printed educational materials	Distribution of clinical recommendations for clinical work in, including clinical guidelines, in printed format. The material may be distributed personally or via mail.	The EPOC taxonomy defines the distribution of educational materials as the distribution of published or printed recommendations for clinical care, including clinical practice guidelines, audio-visual materials and electronic publications (see http://epoc.cochrane.org/epoc-methods). Printed educational materials (PEMs) (e.g. clinical practice guidelines) can be delivered personally (i.e. addressed to a specific individual), through mass mailings or passively delivered through broader communication channels (printable documents on the internet, mass media) (Grimshaw 2004). The advances in electronic technologies led the electronic educational materials become more widespread in clinical practice: the access to this information will influence its impact on the providers (McGowan 2010).
Distribution of electronic educational materials	Dissemination of clinical recommendations in electronic format. The material is usually distributed via email or published on web pages.	
Economic incentives	Bonus payments to health care professionals if they achieve certain predefined mold.	--
Interprofessional collaboration	Establishment of interdisciplinary teams.	--
Checklists	Checklists (usually paper-based) prepared to improve work processes and better patient safety.	--
Strategies to change organisational culture	--	--
Public release of performance data	Quality indicators are measurable variables that provide information about quality within an area.	--

Appendix 1.5. Further reading on practical aspects of implementation

Practical information can come from websites of institutes such as the CIHR (Canadian Institutes of Health Research)[w]. Their webpage "Knowledge Translation in Health Care: Moving from Evidence to Practice" aims to facilitate the outline of knowledge translation strategies and implementation of knowledge translation activities. It has for instance a section on "Selecting, tailoring and implementing knowledge translation interventions".

Another interesting source of information could be the GIRAnet network (Guideline Implementability Research and Application Network)[x], a working group, affiliated with the Guidelines International Network (G-I-N).

NICE (National Institute for Health and Care Excellence, UK) provides several tools to help with planning or conducting improvement initiatives based on guidelines, and with estimating the resource impact of implementing guidance (https://www.nice.org.uk/about/what-we-do/into-practice/audit-and-service-improvement; email: implementation@nice.org.uk).

The Registered Nurses' Association of Ontario (www.rnao.ca/bpg) published: "Toolkit: implementation of best practice guidelines (2nd ed.) (2012)- Toronto, ON"

[w] http://www.cihr-irsc.gc.ca/e/40618.html#toc

[x] http://www.g-i-n.net/working-groups/implementation

REFERENCES

1. Benahmed N, Adriaenssens J, Christiaens W, Paulus D. Towards tailoring of KCE guidelines to users' needs. Method. Brussels: Belgian Health Care Knowledge Centre (KCE). 2017. KCE Reports 284.
2. Tabak R, Khoong E, Chambers D, Brownson R. Bridging research and practice: models for dissemination and implementation research. Am J Prev Med. 2012;43(3):337-50.
3. Morrato E, Battaglia C, Castillo B, Ciccutto L, Kempe A, Lambert-Kerzner A, et al. Dissemination and implementation in health: Training guide and workbook D&I training workshop 2013.
4. Parchman M. Diffusion, Dissemination and Implementation: What is the Difference? Seattle: GroupHealth - MacColl Center for Health Care Innovation; 2015. Available from: https://www.nihcollaboratory.org/Pages/GR-Slides-10-09-15.pdf
5. Fixsen DL, Naoom SF, Blase KA, Friedman RM. Implementation research: a synthesis of the literature. 2005.
6. Pronovost PJ, Rinke ML, Emery K, Dennison C, Blackledge C, Berenholtz SM. Interventions to reduce mortality among patients treated in intensive care units. Journal of critical care. 2004;19(3):158-64.
7. Brown BS, Flynn PM. The federal role in drug abuse technology transfer: A history and perspective. Journal of Substance Abuse Treatment. 2002;22(4):245-57.
8. Desomer A, Dilles T, Steckel S, Duchesnes C, Vanmeerbeek M, Peremans L, et al. Dissemination and implementation of clinical practice guidelines in Belgium. Health Services Research (HSR). Brussels: Belgian Health Care Knowledge Centre (KCE); 2013. KCE Reports 212.
9. Nilsen P. Making sense of implementation theories, models and frameworks. Implement Sci. 2015;10:53.
10. Kitson A, Harvey G, McCormack B. Enabling the implementation of evidence based practice: a conceptual framework. Qual Health Care. 1998;7(3):149-58.

11. Kitson AL, Rycroft-Malone J, Harvey G, McCormack B, Seers K, Titchen A. Evaluating the successful implementation of evidence into practice using the PARiHS framework: theoretical and practical challenges. Implement Sci. 2008;3:1.
12. Wright J, McCormack B, Coffey A, McCarthy G. Evaluating the context within which continence care is provided in rehabilitation units for older people. Int J Older People Nurs. 2007 2(1):9-19.
13. Harvey G, Kitson A. Translating evidence into healthcare policy and practice: Single versus multi-faceted implementation strategies - is there a simple answer to a complex question? Int J Health Policy Manag. 2015;4(3):123-6.
14. Effective Practice and Organisation of Care (EPOC). EPOC Taxonomy [Web page].2015 [cited 14/09/2017]. Available from: https://epoc.cochrane.org/epoc-taxonomy
15. Powell B, Waltz T, Chinman M, Damschroder L, Smith J, Matthieu M, et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implement Sci. 2015;10:21.
16. Flodgren G, Hall A, Goulding L, Eccles M, Grimshaw J, Leng G, et al. Tools developed and disseminated by guideline producers to promote the uptake of their guidelines. Cochrane Database Syst Rev. 2016;22(8).
17. Baker R, Camosso-Stefinovic J, Gillies C, Shaw E, Cheater F, Flottorp S, et al. Tailored interventions to address determinants of practice. Cochrane Database Syst Rev. 2015;29(4).
18. Fretheim A, Flottorp S, Oxman A. NIPH Systematic Reviews: Executive Summaries. In: Effect of Interventions for Implementing Clinical Practice Guidelines. Oslo, Norway: Knowledge Centre for the Health Services at The Norwegian Institute of Public Health (NIPH); 2015.
19. Moja L, Kwag K, Lytras T, Bertizzolo L, Brandt L, Pecoraro V, et al. Effectiveness of computerized decision support systems linked to electronic health records: a systematic review and meta-analysis. Am J Public Health. 2014;104(12):e12-22.
20. Roshanov P, Fernandes N, Wilczynski J, Hemens B, You J, Handler S, et al. Features of effective computerised clinical decision support systems: meta-regression of 162 randomised trials. BMJ. 2013;346:f657.
21. Van de Velde S, Roshanov P, Kortteisto T, Kunnamo I, Aertgeerts B, Vandvik P, et al. Tailoring implementation strategies for evidence-based recommendations using computerised clinical decision support systems: protocol for the development of the GUIDES tools. Implement Sci. 2016 5(11):29.
22. Francke A, Smit M, de Veer A, Mistiaen P. Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. BMC Med Inform Decis Mak. 2008;8:38.
23. Grimshaw J, Thomas R, MacLennan G, Fraser C, Ramsay C, Vale Le, et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. 2004.
24. LaRocca R, Yost J, Dobbins M, Ciliska D, Butt M. The effectiveness of knowledge translation strategies used in public health: a systematic review. . BMC Public Health. 2012 7(12):751.
25. Flodgren G, Parmelli E, Doumit G, Gattellari M, O'Brien MA, Grimshaw J, et al. Local opinion leaders: effects on professional practice and health care outcomes. The Cochrane Library. 2011.
26. Powell B, Beidas R, Lewis C, Aarons G, McMillen J, Proctor E, et al. Methods to Improve the Selection and Tailoring of Implementation Strategies. J Behav Health Serv Res. 2017 44(2):177-94.
27. Breckson J, Dudson J. Using Evidence. What works? A discussion paper. 2016. Available from: http://www.alliance4usefulevidence.org/
28. Langer L, Tripney J, Gough D. The Science of Using Science: Researching the Use of Research Evidence in Decision-Making. Technical Report. 2016. London: EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London

29. McDermott L, Stead M, Hastings G, Angus K, Banerjee S, Rayner M, et al. A systematic review of the effectiveness of social marketing nutrition and food safety interventions: final report prepared for Safefood. 2005. Stirling: University of Stirling, Institute for Social Marketing Available from: https://www.stir.ac.uk/media/schools/nursing/ism/documents/SAFEFOOD%20FULL%20REPORT%2008.04.05.pdf

30. Federaal Kenniscentrum Centre d'Expertise des soins de santé. KCE Process book [Web page]. Available from: http://processbook.kce.fgov.be/node/1

31. Hussain T, Michel G, Shiffman R. The Yale Guideline Recommendation Corpus: a representative sample of the knowledge content of guidelines. Int J Med Inform. 2009;78(5):354-63.

32. National Institute for Health and Clinical Excellence. The guidelines manual. 2012. London: National Institute for Health and Clinical Excellence Available from: www.nice.org.uk

33. Hallsworth M, Snijders V, Burd H, Prestt J, Judah G, Huf S, et al. Applying Behavioral Insights: Simple Ways to Improve Health Outcomes. 2016. Doha, Qatar: World Innovation Summit for Health Available from: http://38r8om2xjhhl25mw24492dir.wpengine.netdna-cdn.com/wp-content/uploads/2016/11/WISH-2016_Behavioral_Insights_Report.pdf

34. Wei C, Herrick A, Raymond H, Anglemyer A, Gerbase A, Noar S. Social marketing interventions to increase HIV/STI testing uptake among men who have sex with men and male-to-female transgender women. Cochrane Database of Systematic Reviews 2011;9.

35. Thaler R, Sunstein C. Nudge: improving decisions about health, wealth, and happiness. 2008. New Haven: Yale University Press

36. Hollands G, Shemilt I, Marteau T, Jebb S, Kelly M, Nakamura R, et al. Altering micro-environments to change population health behaviour: towards an evidence base for choice architecture interventions. BMC Public Health 2013;13:1218.

37. Benartzi S, Beshears J, Milkman K, Sunstein C, Thaler R, Shankar M, et al. Should Governments Invest More in Nudging? Psychol Sci. . 2017 28(8):1041-55.

38. Arno A, Thomas S. The efficacy of nudge theory strategies in influencing adult dietary behaviour: a systematic review and meta-analysis. BMC Public Health. 2016;16(676).

39. Aggarwal A, Davies J, Sullivan R. "Nudge" in the clinical consultation--an acceptable form of medical paternalism? BMC Med Ethics. 2014 15:31.

40. Mittman B. Chapter 19: Implementation Science in Health Care in Dissemination and Implementation Research in Health: Translating Science to Practice. Available online: https://www.izsummitpartners.org/content/uploads/2015/02/Implementation-science-health-care-chapter-Mittman-10-02-2014.pdf. Oxford Scholarship. 2012.

41. Brownson R, Colditz G, Proctor E. Dissemination and Implementation Research in Health: Translating Science to Practice. Chapter 19: Implementation Science in Health Care. 2012.