

Adopting Health Behavior Change Theory Throughout the Clinical Practice Guideline Process

NATALIE E. CECCATO, MSc; LORRAINE E. FERRIS, PhD, CPsych, LLm;
DOUGLAS MANUEL, MD, MSc, FRCPC; JEREMY M. GRIMSHAW, MBChB, PhD, FRCGP

Adopting a theoretical framework throughout the clinical practice guideline (CPG) process (development, dissemination, implementation, and evaluation) can be useful in systematically identifying, addressing, and explaining behavioral influences impacting CPG uptake and effectiveness. This article argues that using a theoretical framework should increase the utility and probably the implementation of a CPG. A hypothetical scenario is provided using the theory of planned behavior (TPB) to aid in our explanation. While other theories may be viable, the TPB is chosen because it accounts for a wide spectrum of behavioral factors known to influence physician behavior, and because its flexibility allows it to be used for different populations (e.g., specialists), behaviors, and contexts (e.g., hospital, private clinic). In addition, evidence has indicated that the TPB can influence physician behavior. Empirical research examining whether CPG utility can be significantly improved by appropriately selecting and implementing theory throughout the CPG process is warranted.

Key Words: theory, clinical practice guidelines (CPGs), behavior influences, systematize, effectiveness, development, dissemination, implementation, evaluation

Introduction: Clinical Scenario

Reports begin to surface indicating pregnant women are not receiving thorough and consistent information regarding exercise during pregnancy. Subsequently a medical association systematically identifies a need to create a new clinical practice guideline (CPG) to help physicians discuss exercise with pregnant patients.

The medical association has a great deal of experience in creating and disseminating CPGs. The Task Force assigned to develop this particular CPG are aware of the obstacles that can affect a CPG's implementation. For ex-

ample, they note past challenges in making physicians aware of CPGs and in addressing practitioners' perceptions of their relevance and utility.¹ Therefore, while the Task Force knows it is essential to develop the guideline using a systematic and evidence-based approach, they also see the need to consider ways to increase the acceptability and uptake of the CPG. The Task Force hires a consultant on behavior change.

To ensure the guideline is effective, the behavior change consultant determines there is a need to identify and subsequently address factors influencing the (targeted) physicians' likelihood of adopting the guideline, including relevant personal (e.g., beliefs, self-efficacy/perceived behavioral control), social (e.g., peer support), and environmental (e.g., support staff, time, reminder systems) factors. The implementation of a theoretical framework is recommended to identify, understand, and address factors influencing the adoption of the CPG systematically.

The consultant points out that behavior change theory is seldom used in physician behavior change² and has never been used to guide *all* aspects of a CPG (development, dissemination, implementation, evaluation). As such, while the CPG Task Force is interested in using a behavior change theory, they ask the consultant for more information on behavior change theory, including recommendations on how it can improve the development and uptake of their guideline.

Ms. Natalie E. Ceccato: PhD student, Public Health Sciences Department, University of Toronto, Toronto, Canada; *Dr. Lorraine E. Ferris:* full professor, Public Health Sciences Department, University of Toronto, Toronto, Canada, Clinical Epidemiology, Sunnybrook Health Sciences Centre, Toronto, Canada, and Institute for Clinical Evaluative Sciences, Toronto, Canada; *Dr. Douglas Manuel:* assistant professor, Public Health Sciences Department, University of Toronto, Toronto, Canada, and Institute for Clinical Evaluative Sciences, Toronto, Canada; *Dr. Jeremy M. Grimshaw:* director, Clinical Epidemiology Program, Ottawa Health Research Institute and Department of Medicine, Ottawa, Canada.

Correspondence: Natalie Ceccato, Institute for Clinical Evaluative Sciences, G1 06, 2075 Bayview Avenue, Toronto, Ontario, Canada M4N 3M5; e-mail: natalie.ceccato@ices.on.ca.

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This article examines the use of a theoretical framework for improving the development, dissemination, implementation, and evaluation of CPGs. We continue to build on the preceding theoretical example—including the application of the theory of planned behavior to facilitate the adoption of a CPG about exercise recommendations to healthy pregnant patients. This example will illustrate the use of theory in developing relevant and applicable guidelines, effective dissemination and implementation strategies, and scientific evaluation methods.

CPGs and the Value of Behavioral Change Theory

Behavioral change theory provides an organized system for identifying and conceptualizing behavior facilitators and barriers. Theory can also explain the behavior change (or lack of change) process. These functions allow the identification of relevant behavior change techniques to address behavior influences and their impact on the desired behavior. When health behavior change theory is applied to CPGs, it can provide a systematic mechanism for developing relevant guidelines and for identifying, designing, and implementing intervention strategies that target salient physician behavior influences that could otherwise negatively impact physician uptake or the effectiveness of the CPGs.^{3,4} Behavioral change theory can also provide an opportunity to draw causal links among guideline dissemination, implementation strategies, and behavior as well as a guide for evaluation design to improve the evaluation of CPGs.⁵

Behavioral change theory should be applied across the entire CPG process (development, dissemination/implementation, evaluation). Within each of these processes there

are factors that influence physician behavior, which, when addressed, can facilitate physician uptake of the CPGs and improve their effectiveness. FIGURE 1 provides an overview of how theory can improve the CPG process.

Theory of Planned Behavior (TPB)

While many health behavior change theories exist and warrant exploration in this field (e.g., the transtheoretical model), the TPB is selected for our example because there is a considerable evidence base around its use. The TPB encompasses a comprehensive list of behavior influences known to affect CPG utility and physician behavior.⁶ The theory has been used to explain significant associations between beliefs, attitudes, social influences (social norms), and perceived abilities to perform the behavior (perceived behavioral control) and physicians' mammography screening use,⁷ sexually transmitted disease/human immunodeficiency virus (STD/HIV) counseling,⁸ antibiotic prescribing,⁹ and sigmoidoscopy screening rates,¹⁰ among other physician behaviors. The theory is flexible to accommodate different physician specialties, practice contexts, and behaviors targeted for change.¹¹

The TPB assumes human behavior is primarily rational, driven by systematic decision making derived from motivational factors. Once these factors are identified, they can be used to predict, alter, and explain health behaviors. According to the theory, intention (which represents the motivation to perform a given behavior) and perceived behavioral control (PBC) (which reflects an individual's perceived ability to perform the behavior) directly influence the targeted behavior. Attitude, social norms (SNs), and PBC moderate

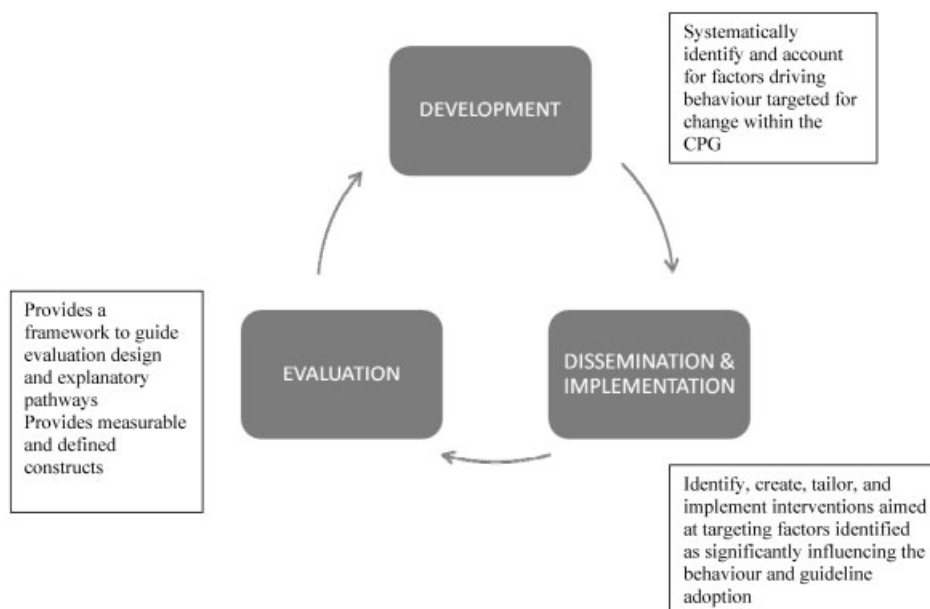


FIGURE 1. The role of health behavior change theory in clinical practice guidelines.

intention and are influenced by behavioral, normative, and control beliefs, respectively. As such, personal beliefs regarding the behavior itself (e.g., need to change behavior), social groups' perceptions of the behavior (e.g., a colleague believes pregnant women should not be encouraged to exercise), and beliefs about being able to perform the behavior given certain barriers and facilitators form the backbone of behavior. External variables (EVs) such as practice policy, time, patient requests, and other environmental influences also impact physician behavior through the other TPB constructs.¹⁰ While the TPB is very applicable to the field of physician behavior change, the theory encompasses only motivational factors (with the exception of PBC). Other variables relating to actual performance of the behavior (as opposed to intention to perform it), such as action planning, have been identified as significantly contributing to the tar-

geted behavior's occurrence.¹²⁻¹⁴ While other health behavior change theories may be useful in this field, this article focuses only on the TPB's factors, as the principles discussed generalize to other theoretical models addressing other factors. FIGURE 2 provides additional information on the TPB's constructs as well as a visual image of how constructs operate independently and interactively to influence behavior.

Development

A review of Canadian guidelines submitted to the CMA Infobase shows there is a growing emphasis on systematic approaches that involve inclusion, grading, and evaluation criteria for evidence-based research.¹⁵ While the way evidence is identified, evaluated, and synthesized is critical for

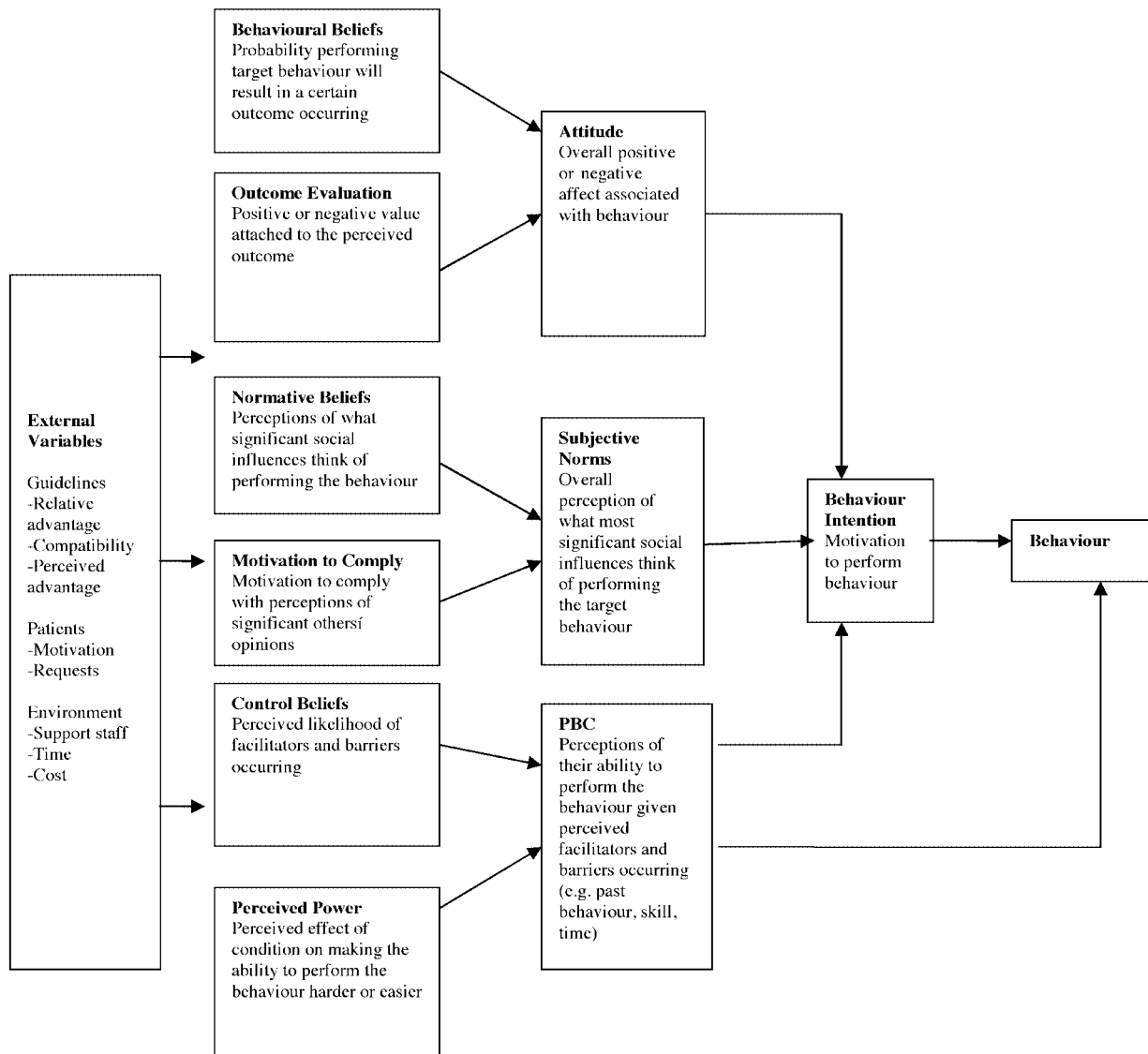


FIGURE 2. An overview of the theory of planned behavior: Physician behavior change.

development, it is important to ensure that targeted physicians believe the CPG is applicable to situations they face. Regardless of guideline quality, if a physician does not perceive it is applicable to his or her personal, social, and practice environment, then the guideline is unlikely to be adopted.^{6,16,17} Health behavior change theories can address the issue of relevancy and applicability by identifying and measuring pertinent personal (e.g., beliefs regarding need to change), social (e.g., colleague practices), and environmental (e.g., practice policy) factors influencing the physician's behavior. This information can then be incorporated into CPG content to address the barriers.¹⁸ By using theory in this way, physicians should be more likely to perceive a benefit to the indicated behavior change relative to current practices, compatibility with existing practices, and ease of use, thus increasing the likelihood physicians will not ignore the CPG or alter it to fit their setting (which could create risk of misapplication).^{4,6,17,19}

The TPB is a parsimonious theory that includes many factors identified as influential in physician behavior change, including guideline adoption. These encompass beliefs relating to the behavior, guideline, and social influences as well as attitudes, PBC (i.e., self-efficacy), and behavior intention (i.e., motivation). External variables relating to the physician (e.g., awareness, knowledge), patients (e.g., requests), guidelines (e.g., convenience), and environment (e.g., time, support staff)⁶ are also accounted for in the theory. As such, the TPB can be used empirically and systematically to identify factors influencing the intended behavior. Fortunately, the theory is flexible enough to enable salient influences relating to specific situations to be included. Once identified, the nature of the influence can be explained, allowing developers to tailor the content of the guidelines to address these factors.

Let us consider our example of using the TPB to improve adoption of a CPG aimed at physician exercise recommendations to healthy pregnant patients. In order to identify and evaluate behavior influences of the target audience (related to the CPG), a random survey is conducted by the consultant. Negative or conservative behavioral beliefs such as “encouraging a healthy woman to exercise during pregnancy creates unnecessary risk for the woman and her fetus” or “talking to a pregnant woman about exercise will not alter her exercise behavior” are identified among others as significantly related to their target populations' intention to provide exercise recommendations to healthy pregnant patients.²⁰ In this case, it is unlikely a physician will thoroughly read, let alone adopt, a guideline incongruent with his or her thinking. If the guideline content addresses these identified negative behavioral beliefs at the outset, for example, by providing empirical evidence of the benefits of physical activity during pregnancy and discussing the negative consequences of inactivity (e.g., excessive weight gain) in a bold and eye-catching way, this may serve to increase the uptake of the CPG (and its effectiveness).¹⁸ Therefore, using theory (such as the TPB) to identify dominant

barriers and facilitators related to a targeted behavior, such as exercise recommendations during pregnancy, before CPG development and addressing them in the content of the guidelines may facilitate the CPG development.

Merely identifying a factor as being influential is insufficient; it is critical that the CPG address it. For example, if physicians lack confidence in their ability to discuss exercise (negative PBC), they will be unlikely to adopt the guidelines, believing their perceived inability may result in costly errors. A section of the pregnancy exercise recommendations guideline could provide practical and concise information on how to prescribe exercise. For example, guidelines providing specific practical recommendations for treating and managing schizophrenia resulted in more positive attitudes, PBC, and intention to implement among service users.²¹ Alternatively, if PBC is highly positive, there is little need for the CPG to focus on practical components of exercise as the target audience is already confident they can perform exercise recommendations. If time is identified as a perceived barrier, the Task Force could include a breakdown of approximate time for each component in some graphical format (e.g., initial discussion and subsequent monitoring/follow-up) within the CPG as a way to provide physicians with information to change their perception of time constraints. If social groups are influential, they can be used as an alternative or supplemental way of tackling other beliefs such as confidence and lack of time. For example, if a particular social source is identified as a positive, significant influence that physicians are motivated to comply with, in addition to including a personal endorsement, personal accounts of how they overcame their own lack of confidence and fears of insufficient time may influence these beliefs. Such factors should also be considered when planning dissemination and implementation strategies (see later discussion).

Of course, our example is a hypothetical situation and different behavior factors may be influential in this situation as other techniques may also be effective in development. Clearly guidelines cannot address all significant behavior influences in the developmental phase as these may be unknown or their consideration may need to be brief. Walker and colleagues (2001) used the TPB to identify dominant beliefs influencing physician antibiotic prescriptions for patients presenting with sore throats. In doing so, they were able to address significant beliefs rather than wasting resources by including every possible belief relating to antibiotic prescriptions.⁹ As such, using theory empirically to identify the most salient behavior influences and identifying how to address them in a creative and parsimonious manner should improve guideline development.

Dissemination and Implementation

Theory can be useful during dissemination and implementation as it can lead to the identification of interventions that could target relevant behavior influences.^{4,16,22} Although

theory is seldom used in physician behavior change literature, some research does use theory to identify intervention strategies that focus on personal, social, and environmental factors influencing the likelihood of behavior change, including guideline adoption.¹⁹ Adopting theory during this stage can make outcomes more predictable and increase the probability intervention strategies will be more effective and efficient compared to randomly selecting and implementing intervention strategies.^{12,23,24}

To provide a more thorough picture of the role of theory in dissemination and implementation of CPGs, let us again consider our example. If feelings of insufficient knowledge and skills (PBC) contribute significantly to guideline uptake, then this problem can be addressed directly in dissemination and implementation strategies. For example, actively disseminating flowcharts or reference charts that physicians can post in their offices would be one method for reassuring physicians of their knowledge and skills in discussing exercise with pregnant patients. Using charts as a quick reference tool can help physicians who are not confident of their ability to address the topic and who may otherwise avoid discussing it with patients. This strategy could be coordinated with active implementation strategies such as small group interventions. Small group interventions may also allow for a number of factors to be addressed simultaneously. Interventions such as these could involve practical demonstrations and opportunities for practice and skill development to improve perceptions of control, confidence, and skills. Barriers and practical issues such as time constraints could be identified and solution planning addressed in small groups, allowing members to learn from one another. For example, the group could identify tips for reducing the physician's time such as involving office staff and using educational techniques to reduce one-on-one education time.

Audit and feedback may be a useful intervention to follow up skill-based workshops when perceived inability to provide exercise recommendations and numerous barriers are identified. Assessing the physicians' ability to include exercise recommendations in their practice as well as addressing individual physician questions and concerns will promote long-term behavior change.

When social influences (SNs) are important, they can be used to promote the behavior directly as well as indirectly by addressing other constructs. For example, local opinion leaders could be solicited to teach how to implement exercise recommendations in practice. Once opinion leaders have the skills to perform and educate on the behavior, they can be sent into the community to hold local level outreach and provide a convenient and accessible help resource. Opinion leaders can address other behavior factors as well by using personal accounts and promote the behavior by addressing beliefs, PBC, and barriers identified as salient to behavior change among targeted physicians. TABLE 1 identifies possible factors influencing the adoption of our hypothetical CPG and ways they might be addressed during develop-

ment, dissemination, and implementation to promote adoption of the guideline.

Evaluation

Clinical practice guidelines (CPGs) were originally developed to synthesize research with evidence-based practice and to assist health care providers in medical decision making. Without scientific evaluations of CPGs we cannot draw valid and clear conclusions regarding the potential impact of guidelines as well as future directions for the field.²⁵

Health behavior change theory is useful for evaluating a guideline because it provides explanations for why a guideline is or is not successful in achieving its objective(s).² This understanding is essential to improving a guideline's impact. Use of theory facilitates explanations of measured change in outcome and/or process measures because constructs contributing to an intended behavior change measure are identified and the pathway can be measured and explained. In addition, these constructs are defined and often include methods for measurement (e.g., TPB).

Referring again to the example, a random survey conducted by the consultant explores whether the CPG is adopted (including factors influencing the adoption and nonadoption of the CPG) by the audience of physicians targeted by the CPG. Feeling confident in the ability to perform exercise recommendations (PBC) significantly relates to adopting the guideline. Because the TPB outlines that PBC influences motivation (intent) and possibly behavior directly (guideline adoption) we can not only identify ways that PBC significantly influences adoption of the guideline but explain how it influences adoption. It is also possible to examine whether those who adopt the guideline have significantly greater PBC than those who do not, thereby shedding light on promising areas to promote adoption of the guideline. By using the TPB for evaluating the impact of the guideline we can systematically examine change in targeted behavior, understand and explain measured change(s) via identified behavior influences, and identify future directions for improvement.

By utilizing the TPB from the beginning of the pregnancy exercise recommendations guideline's development through dissemination and implementation, the stage is set to facilitate a systematic evaluation design. For example, baseline measures of behavior influences (e.g., beliefs, attitudes, social influences) as well as behavior (exercise recommendations provided to pregnant patients) are probably available (given that the TPB was used to guide development). These baseline measures could then be used in the evaluation's design, fostering a stronger scientific approach (e.g., possibility of repeated measures) particularly if evaluation design is considered at the outset (CPG development) rather than after interventions occur.

As such, adopting health behavior change theory can allow stronger scientific evaluations. This is particularly the case if evaluation design is considered during development planning, when steps such as randomization and control

groups could be considered.⁵ Waiting until behavior change interventions are implemented to consider evaluation methods limits possible measures and design opportunities.

Conclusion

This article has shown how health behavior change theory could be useful for improving clinical practice guideline utility. While the proposed role of theory to weave the guideline process together and improve development, dissemination, implementation, and evaluation of the guideline is important, evidentiary support is lacking. Future research should empirically explore the role of theory in CPGs. In addition, while it is our perspective that theory may be useful, it is not possible to ensure that good theories are selected or used as intended. It is important that strong theories (relevant and flexible enough to fit specific specialties, behaviors, and contexts) are adopted and evaluated in order to enhance understanding of the impact

Lessons for Practice

- Theory can be used to develop guidelines that are relevant to the targeted audience, behavior, and context.
- Theory can be used to identify and develop dissemination and intervention strategies that target factors influencing the likelihood of guideline adoption and subsequent intended behavior change.
- Theory can be an effective tool for allowing evidence-based evaluations of guidelines.
- Overall theory can unify the components of guidelines, potentially increasing the likelihood of guideline implementation.

TABLE 1. Examples of How the TPB Can Be Used to Influence Development, Dissemination, and Implementation

TPB Construct	Example	Development	Dissemination	Implementation
Behavioral beliefs	Women who exercise put themselves at unnecessary risk	Legitimize importance of exercise		Continuing education sessions invoking critical discussions on evidence
		<p>Include strong evidence exercise is beneficial and not harmful, harm of sedentary lifestyle, quality of life during pregnancy</p> <p>Endorsement, personal account from identified influential and motivational social organization or leader</p>		Explicitly address in workshop settings or audit and feedback interventions
Perceived behavioral control	Physicians lack confidence in their ability to discuss exercise	Section with practical and concise information	Mailing of flowcharts or reference charts to hang on office walls for quick reference and trigger patient requests	Small group-based workshops that are practical and provide opportunity to develop skills and build confidence
		Include flowchart, reference charts		Individual follow-up audit and feedback to assess translation into individual practice and questions to promote long-term adoption
Perceived barriers	Lack of time perceived for discussing exercise	Include statement identifying misconception related to time burden including the actual time required	Extra resources supplied to physicians including educational patient handouts to reduce education time required	Practical-based workshop demonstrating and practicing little time required
		Break down time allotment for each component of the behavior		Practical tips to reducing time such as involving staff, educational handouts for patients

of CPGs during the entire guideline process. While the field of clinical practice guidelines is working toward improved standards of development, dissemination, implementation, and evaluations, considering the role of theory throughout may be an important step.

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