

## Applying Prochaska's model of change to needs assessment, programme planning and outcome measurement

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### Abstract

A major goal of continuing medical education (CME) is to enhance the performance of the learner. In order to accomplish this goal, careful consideration and expertise must be applied to the three primary ingredients of CME planning: assessing learner needs, programme design and outcome measurement. Traditional methods used to address these three components seldom result in CME initiatives that change performance, even in the presence of sophisticated CME formats and capable learners. In part, performance may not change because the learner is not 'ready to change'. Planners of CME are aware of this concept but have been unable to measure 'readiness to change' or employ it in assessing learner needs, and planning and evaluating CME. One theory that focuses on an individual's readiness to change is Prochaska's model, which postulates that change is a gradual process proceeding through specific stages, each of which has key characteristics. This paper examines the applicability of this model to all components of CME planning. To illustrate the importance of this model, this paper provides examples of these three components conducted both with and without implementation of this model.

### Introduction

The ultimate goal of continuing medical education (CME) is to improve the health of individuals. One method to improve the health of patients is to shape the behaviour of health care providers towards using the most effective medical treatments. A multitude of initiatives aimed at changing physician behaviour have been offered in recent years. These initiatives often apply traditional educational research/strategies in their attempt to optimize learning. These tactics, however, seldom result in an actual change in physician behaviour (Davis *et al.* 1995). We propose that a key remedy for this problem is to improve the

quality of CME by applying knowledge of behaviour change to the CME planning process. Developing CME initiatives includes three imperative processes: assessment of learner needs, programme design to meet those needs and outcome measurement. If we, as educators, wish to shape the behaviour of physicians, surely we must incorporate behavioural change theories into our educational curriculum.

Theories on learning and behaviour change have been documented (Hergenhahn 1988; Fox *et al.* 1989). With the exception of Piaget (Hergenhahn 1988), most theories do not consider progression of the learner through distinct stages. In 1982, James Prochaska and Carlo DiClemente, two psychologists

in the practice of treating addiction, developed a theory that attempts to explain how individuals change their behaviour. Prochaska *et al.* (1992) assert that an individual attempting to change his behaviour progresses through a cycle consisting of five distinct stages. Movement between stages depends on a complex set of forces that alter an individual's thought processes. The strength of this model is 'a shift in emphasis from actual behavior change to encompass the majority of individuals who are either unsure or are not currently thinking about change' (Joseph *et al.* 1997). The model also asserts that a number of attempts through the stages of change are needed before a long-term behaviour goal is achieved. The model has been applied to studies that have sought to help people develop healthy behaviours (physical activity, Marcus 1992; breast mammography, Rakowski *et al.* 1992) and to eradicate problem behaviours (smoking, Prochaska & DiClemente 1985; overeating, O'Connell & Velicer 1988; excessive drinking, DiClemente & Hughes 1990). Studies have demonstrated the utility and validity of this model in a variety of contexts (Prochaska 1994).

Given the utility of the Prochaska model in behavioural change, we have formally adapted the model to CME (Parker & Parikh 1999), with the CME learner progressing through the five Prochaska stages: (i) pre-contemplation, with no perceived need or intention to change; (ii) contemplation, with awareness of a problem but no commitment to take action; (iii) preparation for action that combines intention and initial behaviour change; (iv) recent change, with significant modification of behaviour; and (v) maintenance, with sustained behavioural change. Learners will be at specific stages that differ depending on the precise subject or topic, reflecting their familiarity and expertise with each disorder.

This paper systematically applies the Prochaska model to all three processes in CME: assessing learner needs, programme planning and outcome measurement.

### Needs assessment

The purpose of assessing learner needs is to give the educator knowledge of what information the learner perceives is relevant or desirable. The assessment is

carried out prior to planning the content and format of the CME programme. Methods of assessing learner needs typically include the collection of quantitative (survey, questionnaire) data and/or qualitative (focus group, interviews) data. These data are then analysed accordingly and the information provides the educator with a better understanding of what the content and format of the programme should incorporate. Traditional processes, however, are flawed: they fail to illustrate the variance in learner needs. To illustrate the application of Prochaska to the process of assessing learner needs, we present two examples; one uses a traditional method to assess needs, the other incorporates the Prochaska model.

### Needs assessment without Prochaska

One of the many traditional methods used to assess learner needs is the written survey. A list of possible topics is provided and the respondent is asked to rate their interest in each topic on a scale from 1 to 5. A sample of this form is provided in Table 1.

Data from completed surveys are analysed and mean scores for each topic are generated (results provided in last column of Table 1). These results indicate a greater learning need for topics such as depression and anxiety, with a lesser need for information on psychotic disorders. While this information is valuable to CME planners, the data only provide a one-dimensional picture of subjective learner needs. Using traditional methods to assess learner needs, such as the method illustrated above, gives the CME planner little information about the learner's readiness to change their behaviour with regard to these specific disorders.

**Table 1** Example of common needs survey and mean scores for each topic

Topic	Interest level					Mean score
	Low				High	
Depression	1	2	3	4	5	3.49
Bipolar disorder	1	2	3	4	5	2.96
Anxiety disorder	1	2	3	4	5	3.21
Psychosis	1	2	3	4	5	2.75

**Table 2 Results of Prochaska stage analysis: indicators by diagnosis**

Diagnosis	Self-rated knowledge/ability	Practice frequency	Need for diagnostic information	Need for treatment information	Prochaska stage
Depression	High	High	Low	High	Preparation for action
Bipolar disorder	Low	Low	High	High	Contemplation

### Needs assessment with Prochaska

As illustrated, the above example does not address the possibility that specific learner needs may differ by disorder. The Prochaska model, however, may help the CME planner distinguish particular learner needs that may vary across topics. To illustrate, the Primary Care Psychiatry Course is a longitudinal course for family physicians held once a month over a period of 8 months. Each session offers instruction on a particular mental illness commonly seen in primary care settings. For each diagnosis (course topics include depression, bipolar disorder, panic disorders and obsessive-compulsive disorder) a Prochaska stage analysis was conducted. For the analysis, data were collected using two self-report questionnaires. The first questionnaire asked the physician to rate their current knowledge and ability to treat each diagnosis, as well as how often they treat each illness. The second questionnaire asked them to report their perceived need to learn more about how to diagnose and treat each illness. Results for depression and bipolar illness are illustrated in Table 2.

Two important pieces of information are found in this table. Firstly, the educator now knows which stage (or cluster of stages) the learners are in. For the diagnosis of depression, these learners have little perceived need for information about how to diagnose the illness but they do have a need for more information on how to treat the illness. They treat depression frequently and feel confident in their ability to diagnose depression. Thus, these learners do not desire further information about the illness but are ready to improve their treatment methods. They need to be better educated about some of the more sophisticated methods of treatment and are not sure that the current treatment methods that they use are the

best for their depressed patients. These characteristics are indicative of individuals in the preparation for action stage (stage 3).

For bipolar illness, the learners' stage is different. The learners are not confident in their ability to treat or diagnose bipolar disorder. They treat the illness with less frequency than depression and indicate a high need for more information about how to diagnose and treat bipolar illness. They are not yet at the preparation for action stage (as they are with depression); they require more information about bipolar disorder and are not yet ready to make a change in behaviour. This is indicative of Prochaska's contemplation stage (stage 2).

The second piece of important information is the type of learning format and material to be used in each session. The material and format should be chosen so as to maximize the possibility to move the learner from his/her current stage to the next stage. For example, the format and material should support moving from the preparation for action stage to the action stage (stage 4) for the topic of depression and from the contemplation stage to the preparation for action stage for bipolar illness. For example, the session on depression should incorporate some information on some of the novel treatments, as well as instruction on how to handle treatment-resistant patients. Case illustration using standardized patients is an appropriate format for this purpose. The session on bipolar illness, however, should focus on improving the physicians' ability to recognize bipolar disorder and increasing the physicians' comfort with treating the illness. A didactic presentation followed by a video of a manic patient is a suggested format for this purpose.

By having this type of *a priori* information about the learner, educators are now in a better position to move the learner from one stage to another.

### Programme planning

Following the assessment of learner needs, the educator begins to construct the CME product. Many elements are incorporated into the process of programme design; format, duration, methods of instruction and content are the primary components. Typically, certain formats enjoy a better reputation than others. For example, large conferences are used frequently due to popularity with learners and an ease of design and familiarity with programme planners. However, Davis *et al.* (1999) concluded that the large conference or grand rounds are not effective in changing learner behaviour. Implicit in many purposes for conducting adult education programmes is the expectation of change as an outcome or result (Caffarella 1994). If behaviour change is the desired outcome, planners must choose formats that will optimize the possibility of change. Adapting the Prochaska model when planning a CME programme addresses this problem. The model takes into account that behaviour change is a gradual progression through stages, hence, different formats may work better for learners in different stages. Educators must know which stage the learner is in before an attempt to move them to the next stage can be made.

#### An illustration

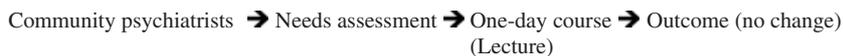
The value of applying the Prochaska model to programme planning is best illustrated by the recent creation of two psychopharmacology courses for community psychiatrists. In January 1999, the Clarke Institute of Psychiatry launched the Toronto Psychopharmacology Courses for Psychiatrists – Intermediate and Advanced. These two longitudinal

courses ran once a month for 6 months and each covered six topics, including depression, bipolar illness, obsessive-compulsive disorder, panic and psychosis. To illustrate the Prochaska influence on planning the above courses, two programme planning processes are illustrated below. The first process does not incorporate the Prochaska model.

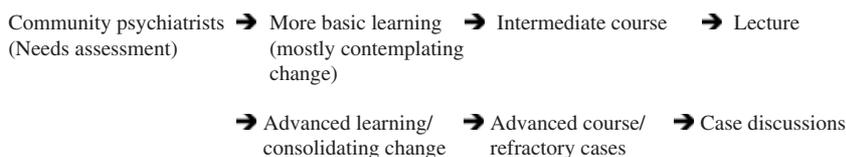
*Programme planning without Prochaska* The planning process traditionally begins with the assessment of learner needs. The results of the needs assessment indicate, as shown in Fig. 1, the most popular topics that community psychiatrists would like to know more about. A 1-day course, using didactic lectures, is then developed to address these needs. Outcome measurements are then developed to measure the presence or absence of change in learner behaviour as a result of attending the course. The course may illustrate a change in behaviour in a small proportion of the learners. However, the course planner knows very little about why those who did not exhibit a behaviour change failed to do so.

*Programme planning with Prochaska* Using the Prochaska model allows the programme planner to assess which stage each learner is in for each diagnosis. Having this knowledge allows the planner to choose the content and format that maximizes the opportunity to move the learner to the next stage. An example of programme planning using the Prochaska model is illustrated in Fig. 2.

A needs assessment using the Prochaska model was conducted with a group of community psychiatrists. The learning needs of this group of professionals formed two distinct groups, suggesting that two separate courses be developed to meet their specific



**Figure 1 Model for programme planning.**



**Figure 2 Model for programme planning incorporating the Prochaska stage analysis.**

needs. The first course, entitled the Toronto Intermediate Psychopharmacology Course for Psychiatrists or TIPP, was developed for learners with a basic knowledge of psychopharmacology but who are not yet ready to change their treatment methods. These learners are clustered in Prochaska stages 2 and 3. The second course, entitled Toronto Advanced Psychopharmacology Course for Psychiatrists or TAPP, was developed for learners who have a solid understanding of psychopharmacology and are ready to change or have made a recent change in their treatment methods. These learners are indicative of Prochaska's stage 4.

This information has direct implications for programme planners. Since the goal of programme planning using Prochaska is to move the learner to the next stage and the intermediate learners are at various stages, the focus is twofold. For the intermediate learners who are contemplating change the goal is to provide them with more basic knowledge, thus preparing them for change. This may be done using didactic teaching. Those in the advanced course already possess the basic knowledge about psychopharmacology and are consolidating change. The goal for programme planners for the advanced learner is to teach the learner to become more confident and competent in providing psychopharmacology practice. This may be accomplished by focusing more on small-group case-based discussions or role plays as part of the course format.

## Outcome measurement

### Outcome measurement without Prochaska

Measuring the value of CME typically focuses on two primary outcomes: participant satisfaction and, with less frequency, behaviour change in the learner. These outcomes are commonly measured using surveys or questionnaires completed by the participants at the conclusion of the course. Participant satisfaction provides the CME planner with valuable feedback on the elements of programme planning (format, duration, methods of instruction). Behaviour change in the learner is an important antecedent to enhancing the clinical abilities of the physician and, hence, ultimately improving patient care. A problem exists, however, in attempting to assess the value of a CME product by focusing solely on these two outcomes. The value of CME may also lie in the ability of the product to prepare the learner for change. To illustrate the importance of using the Prochaska model in outcome measurement, an example of outcome measurement using traditional methods of evaluation is presented below.

As Table 3 indicates, the use of traditional outcome measures, such as client satisfaction and perceived behaviour change, provides valuable feedback but may lead the programme planner to erroneously conclude that their programme was not successful due to the low percentage of learner's reporting that they

**Table 3 Summary of outcome indicators and percentage of learners reporting a behaviour change for CME programmes offered in the 1999/2000 academic year**

<i>CME programme</i>	<i>Client satisfaction/ reaction</i>	<i>Perceived change in learner behaviour</i>	<i>Percentage of respondents reporting a behaviour change</i>
General Psychiatry for Family Physicians Clinical Challenges in Psychiatric Practice Primary Care Psychiatry Course*	Measured	Measured	34.5%
Toronto Intermediate Psychopharmacology Course for Psychiatrists*	Measured	Measured	22.3%
Toronto Advanced Psychopharmacology Course for Psychiatrists*	Measured	Measured	25%
			21%
	Measured	Measured	41%

\*For the first session only (Depression).

have changed their behaviour. These traditional evaluation methods fail to inform the CME planner if the learner is ready to change their behaviour.

#### Outcome measurement with Prochaska

Using the Prochaska model when measuring CME outcomes accomplishes two important goals: measuring a behavioural outcome and measuring a learner's readiness to change their behaviour.

To illustrate, a questionnaire to characterize a learner's self-evaluation of behavioural change, based on Prochaska's model, was completed by 15 out of 20 family physicians (mean age 47.7, 12 female, 8 male) at the end of an eight-session course reviewing various psychiatric illnesses. For each of four disorders, respondents endorsed one of the following: (i) 'I do not treat XX illness, nor do I plan to this year' (Prochaska's pre-contemplation stage); (ii) 'I didn't treat XX illness before this course, but I'm thinking about treating it now' (contemplation stage); (iii) 'I do treat XX illness and the lecture confirmed that I don't need to change my treatment methods' (pre-contemplation/confirmation stage); (iv) 'I do treat XX illness and the lecture helped me change my treatment methods' (preparation for action stage) (Table 4).

A traditional course evaluation may have included only the preparation for action question, which includes initial behaviour change, with less than half of attendees reporting such change. Increased awareness of a problem (as a precursor to change) or decision not to change behaviour (since existing treatment confirmed) are also legitimate but more subtle measures of CME impact, and were reported

by significant numbers of respondents, varying by disorder. Those in the first pre-contemplation column indicated no intention to change, potentially identifying people with other reasons for attending CME programmes or those facing special barriers to change. If success had been measured with this table in terms of movement along stages, only those remaining pre-contemplative would have 'failed'. Thus, for dementia, 85.6% would have successfully used the course to change. These important outcomes would have been overlooked by traditional post-course evaluations. Such data suggest that traditional measures of behavioural change omit important dimensions of the impact of CME, and raise doubt about the numerous reports of the 'failure' of CME to change practitioner behaviour.

#### Conclusions and recommendations

The majority of CME initiatives that aim to change physician behaviour do not illustrate a change in behaviour. Furthermore, the quality of CME is often based on the ability of the initiative to demonstrate a behaviour change. Even with optimal formats being employed by educators, behaviour change is still inconsistent. This may be due to the learner not being ready to change their behaviour. The importance of assessing readiness to change using the Prochaska model has been the focus of a growing number of studies. This paper has illustrated the application of the Prochaska model to all three steps of developing a CME programme; needs assessment, programme planning and evaluation.

There is an important implication of applying the model to the assessment of learner needs. Variance

**Table 4 Behavioural stage response ('CME outcome') by disorder**

<i>Diagnosis</i>	<i>Stage n (%)</i>			
	<i>Pre-contemplation</i>	<i>Contemplation</i>	<i>Pre-contemplation/confirmation</i>	<i>Preparation for action</i>
Dementia	2 (14.3)	9 (64.2)	1 (7.1)	2 (14.3)
Psychosis	3 (20)	4 (26.7)	3 (20)	5 (33.3)
Hypochondriasis and somatization	2 (13.3)	5 (33.3)	0 (0)	8 (53.3)
Substance abuse	4 (30.8)	3 (23.1)	1 (7.7)	5 (38.5)

in learner needs across topics is often missed when using traditional approaches to needs assessments. We have illustrated that, in a group of family physicians, learning needs vary significantly across diagnoses. The Prochaska model helped us in identifying these different needs by investigating which stage each learner was in with respect to each diagnosis, thus enabling us to tailor our CME product to the specific needs of the learner. Further research using this model should incorporate a multidimensional measurement of various learner variables to further refine the needs of the learner.

Knowledge of the stage that the learner is in has direct implications for the typical components of programme planning, such as format, duration, methods of instruction and content. If the objective of the event is to change learner behaviour, planners must choose formats that optimize the possibility for behaviour change. The Prochaska model implies that different education formats may work better for learners in different stages. This paper illustrates the relationship between the model and programme format, methods of instruction and content. A possible relationship between Prochaska and programme duration requires further exploration.

Finally, one of the strengths of the Prochaska model is the consideration that the learner may not be ready to change or be thinking about change. Therefore, the success of an event should not be judged solely on the programme's capacity to produce an observable behaviour change in the learner. The value of an educational programme may lie in the ability of the programme to prepare the learner for change. Further research into the capability of a programme to move the learner across stages is warranted.

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