

# Learning in practice

## The case for knowledge translation: shortening the journey from evidence to effect

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A large gulf remains between what we know and what we practise. Eisenberg and Garzon point to widespread variation in the use of aspirin, calcium antagonists,  $\beta$  blockers, and anti-ischaemic drugs in the United States, Europe, and Canada despite good evidence on their best use.<sup>1</sup> Such variation is common not only internationally but within countries.<sup>2</sup> Large gaps also exist between best evidence and practice in the implementation of guidelines. Failure to follow best evidence highlights issues of underuse, overuse, and misuse of drugs<sup>3</sup> and has led to widespread interest in the safety of patients.<sup>4</sup>

Not surprisingly, many attempts have been made to reduce the gap between evidence and practice. These have included educational strategies to alter practitioners' behaviour<sup>5</sup> and organisational and administrative interventions. We explore three constructs: continuing medical education (CME), continuing professional development (CPD), and (the newest of the three) knowledge translation (box). Knowledge translation both subsumes and broadens the concepts of CME and CPD and has the potential to improve understanding of, and overcome the barriers to, implementing evidence based practice.

### Concepts of CME and CPD

#### Continuing medical education

CME refers to education after certification and licensure. It is arguably the most complex, and clearly the longest, phase of medical education. Most physicians think of continuing medical education in terms of the traditional medical conference, with rows of tables, pitchers of ice water, green table cloths, and a lecturer at the front of the room.<sup>7</sup> Many accreditation systems in the United States, United Kingdom, and Canada value attendance at such activities. This reinforces the teacher driven nature of continuing medical education, which gives little attention to the concept of professional development.

"Knowledge translation is defined as the exchange, synthesis and ethically sound application of knowledge—within a complex system of interactions among researchers and users—to accelerate the capture of the benefits of research ... through improved health, more effective services and products, and a strengthened health care system."<sup>6</sup>

### Summary points

CME and CPD are primarily teacher and learner driven and are unable to address questions of population health or attend to issues of the clinical environment

Knowledge translation offers a more holistic construct, subsuming and building on CME and CPD

Knowledge translation is set within the practice of health care and focuses on changing health outcomes using evidence based clinical knowledge

Knowledge translation can draw on people from many disciplines, including informatics, social and educational psychology, organisational theory, and patient and public education, to help close the gap between evidence and practice

### Continuing professional development

CPD embodies both professional learning and personal growth. It incorporates much of the theory and practice of adult learning,<sup>8</sup> self directed learning,<sup>9</sup> reflective practice,<sup>10</sup> and other models. It also offers the possibility of embracing topics beyond those included in traditional medical education—for example, bio-ethics, business management, and communication skills—topics rarely included in continuing medical education programmes.<sup>11</sup> Although the focus on subjective, learner centred curriculums is laudable, it means that continuing professional development can contribute only marginally to improving public health.

### Limits of CME and CPD

The effects of CME and CPD have been extensively studied.<sup>12</sup> Although it is an unstable and imperfect database,<sup>13</sup> the literature shows that most passive educational activities are poor at changing physicians' behaviour. The most effective strategies tend to be more active (such as reminders or educational outreach visits); multiple<sup>14</sup>; based on accurate assessment of need<sup>15 16</sup>; and aimed at overcoming barriers to change.<sup>17</sup> These strategies are not the staple of most providers of CME and CPD. Furthermore, the

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effectiveness of such methods may be limited by the target (primarily physicians), settings (lecture halls), cost recovery nature (derived largely from participant registration and pharmaceutical contributions), and the process (not outcome) based accreditation principles of these activities.

### Case for knowledge translation

If education and persuasion of doctors cannot close the gap between evidence and practice, other strategies are needed. We believe that knowledge translation is an important tool. Knowledge translation includes groups other than doctors and investigates issues more comprehensively than CME and CPD (table 1). Below we describe how knowledge translation differs from CME and CPD and why it is more effective in producing change.

*Settings and tools*—Since knowledge translation focuses on health outcomes and changing behaviour, it is set in the site of practice and its social, organisational, and policy environment rather than in learning situations. Furthermore, it identifies best evidence and pathways that make it easier for the target individual or group to follow this evidence. The production of these aids to knowledge translation, called tools or toolkits, is commonplace.<sup>18</sup>

*The targets* of the process of knowledge translation are different from those of CME and CPD. These two models both focus on groups of physicians seeking to accrue credits, although CPD may permit a greater emphasis on team and other group learning.<sup>19</sup> Knowledge translation, however, allows attention to be given

to all possible participants in healthcare practices, including patients, consumers, and policy makers.<sup>20</sup> Few models of CPD include patients.<sup>21</sup>

*Content*—The traditional clinical content of CME has given way to more practice based behaviours encompassed by CPD. In turn, knowledge translation builds on these areas, primarily by using evidence based research. Furthermore, as knowledge translation is less learner driven than CME and CPD, it permits a greater emphasis on initiatives to improve population health such as screening, early diagnosis, and preventive measures.

*Primary operating models*—In CME, the major driver (despite the conscientious efforts of CME providers) remains the teacher, using 50 year old planning models.<sup>22</sup> CPD seems to be guided by more self directed or organisational learning principles. Both are predicated on a simple linear model linking learning to relicensing and recertification and only tangentially to performance or healthcare outcomes. In contrast, knowledge translation reflects the considerations of both the practitioner-learner and the educational or clinical policy provider or healthcare system.<sup>6</sup> This more holistic view makes it easier to close the gap between evidence and practice (see below).

*Interdisciplinarity*—Given the multidimensional problems inherent in closing the care gap, any studies of knowledge translation must involve people from all relevant disciplines. Models of CME and CPD have benefited from the expertise of educators, clinicians, social and educational psychologists, for example. Knowledge translation can be enriched by people with training in informatics, patient education, organisational learning, social marketing, continuous quality improvement, and a host of others.

### Models of knowledge translation

Many different models of implementing change have been described,<sup>19–25</sup> but we have chosen two to illustrate how knowledge translation works in closing the gap between evidence and practice. The perspective of the targeted consumer (practitioner, team, policy maker, patient, or population) is represented by a model developed by Pathman et al, which marks progress from awareness, agreement, adoption, to adherence with evidence based practice.<sup>26</sup> The perspective of the effector arm (the healthcare or educational system) is illustrated by Green et al's health promotion model.<sup>27</sup> Here, interventions work in three ways:

- To predispose to change by increasing knowledge or skills

**Table 1** Differentiating features of continuing medical education (CME), continuing professional development (CPD), and knowledge translation

	CME	CPD	Knowledge translation
Settings	Teaching settings	Any learning situation	Primarily practice settings
Tools	Primarily educational methods (lectures, print materials), some attention paid to barriers	Wide variety of learning methods	Methods for overcoming barriers to change—eg prompts, reminders, and patient mediated methods
Targets	Individual doctors; CME credits	Doctors, other health professionals, groups; CPD credits, creation of learning portfolio or self directed learning	Clinicians, teams, health systems, patients, populations, policy makers
Content	Mostly clinical	Clinical plus other practice related areas	As in CME and CPD, possible focus on evidence based information
Guiding model(s)	Primarily educational; CME credits and accreditation important	Self directed learning; CPD credits and accreditation important	Holistic: incorporates clinician-learner and educational delivery system; Evidence based: from content of activity to testing of interventions
Relevant disciplines	Medicine, education, educational psychology	As for CME plus organisational learning theory, social psychology	As for CME and CPD plus systems management, health services research, social marketing, patient education, bioinformatics, and others

**Table 2** Pathman-PRECEED model for knowledge translation

Intervention*	Perspective of target (policy maker, consumer, or clinician)			
	Awareness	Agreement	Adoption	Adherence
Predisposing	Distribution of printed information; journals; media campaigns; lectures, rounds; academic detailing			
Enabling		Opinion leaders; small group sessions for clinicians	Small group sessions for clinicians; patient education methods; clinical flowcharts or algorithms; academic detailing	
Reinforcing			Small group sessions for audit and feedback	Reminders (professional and patient), multiple interventions

\*Perspective of healthcare or educational system.

- To enable the change by promoting conducive conditions in the practice and elsewhere
- To reinforce the change, once it is made.

Table 2 shows a blend of these two models with our best guesses at what interventions might be effective at each stage of the change process.

Although much of this model is as yet intuitive and untested, evidence exists for the validity of some of its components. One recent example illustrates many principles of a holistic knowledge translation process. Tu and colleagues reported a sizeable increase in ramipril prescribing in Ontario as a result of the HOPE study.<sup>28</sup> Some knowledge translation activities included in the model (table 2) enabled the increase in prescribing. Firstly, awareness of the success of preventing cardiovascular events in patients at high risk was achieved by widespread media coverage of the trial followed by national specialist continuing medical education events and journal reporting. Secondly, agreement with the outcome was enabled by the fact that many of the opinion leaders in Ontario's cardiology community were trial investigators and participants. Thirdly, adoption and adherence were facilitated and reinforced by promotion of the drug by the pharmaceutical industry through marketing practices and hosting small group events.

## Next steps

We recognise that our arguments for knowledge translation need to be treated cautiously. Firstly, much of the evidence we have used derives from studies of changing the performance of physicians and health professionals. These studies are often less than robust and not intended for application to patients or policy makers. Secondly, the manner in which we have chosen and applied definitions and models of interventions has been somewhat arbitrary. Thirdly, the case of ramipril prescribing in Ontario is a relatively simplistic innovation; other more complex actions may take different pathways or exemplify different models.

Despite these reservations, we believe that the concept of knowledge translation will prove to be valuable in promoting the rapid uptake of evidence based knowledge by the public, patients, policy makers, and clinicians. Further research is needed to debate and test our model, filling in the empty cells in table 2, extending the dialogue, and broadening the field. We also need to determine which clinical domains or settings are most suitable for applying knowledge translation and which interventions change performance and healthcare outcomes. Training in quantitative, qualitative, and patient centred research methods will be essential to this process.

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