

# EBM Curriculum Development & Evaluation

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## Overview

- Rephrase and re-focus
- Review and apply the evidence
- Why is education an effective intervention
- Evaluating education
- CREATE – a practical framework
- Top tips summary

## Language challenges

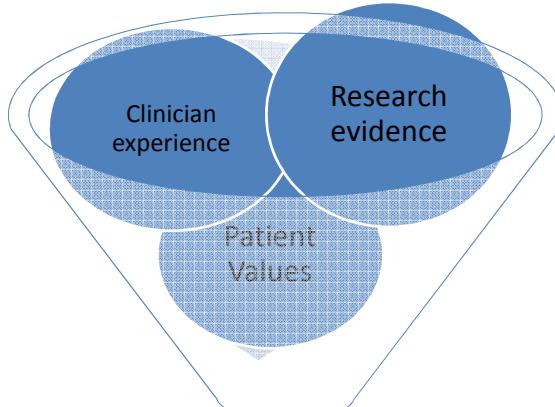
### What are the differences between...

- Curriculum vs Learning
- Development vs Design
- Evaluation vs Assessment

## The meaning of language

- Curriculum vs Learning  
*“Planned educational experience”*
  - Development vs Design  
*“bring out the capabilities or possibilities”*
  - Evaluation vs Assessment  
*“determine the value or worth of”*
- = **Designing effective learning**

## Review the purpose



**Evidence-based Medicine, Practice, Health Care, Management, Policy, Thinking?**

## Review the evidence

### Continuing Practice Development

3 Cochrane Reviews

- **Continuing education meetings and workshops:** effects on professional practice and health care outcomes: Forsetlund et al, 2009
- **Interventions to improve question formulation** in professional practice and self-directed learning: Horsley, 2010
- **Local Opinion Leaders:** effects on professional practice and healthcare outcomes: Flodgren et al, 2011

### Evaluating Education in Evidence-Based Practice

3 systematic reviews

- **What is the evidence that postgraduate teaching in evidence based medicine changes anything?** A systematic review : Coomarasamy & Khan, 2004
- **Instruments for Evaluating Education** in Evidence-Based Practice A Systematic Review: Shaneyfelt et al, 2006
- **Evidence based practice in postgraduate healthcare education:** A systematic review: Flores-Mateo & Argimon, 2007

## Consider the evidence in relation to your practice



### Evidence for educational meetings, workshops

- *Educational meetings* alone or combined with other interventions, *can improve professional practice and healthcare outcomes* for the patients.
- The *effect is most likely to be small* and similar to ... audit and feedback, and educational outreach visits.
- *Strategies to increase attendance* at educational meetings, *using mixed interactive and didactic formats*, and *focusing on outcomes that are likely to be perceived as serious* may increase the effectiveness of educational meetings.
- *Educational meetings alone are not likely to be effective for changing complex behaviours.*

Continuing education meetings and workshops: effects on professional practice and health care outcomes: Forsetlund et al, Cochrane Effective Practice and Organisation of Care Group, 2009

## Improving Formulating Questions?

Interventions to increase the quality of questions formulated in practice produce ***mixed results*** at short- term, and moderate-term follow up (< 9 months).

- 3 studies reported educational intervention ***increased the quality of question formulation within the short term***
- 1 study examined the ***effectiveness in after 1 year and revealed that search skills had eroded over time.***
- ***Sustainability of effects from educational interventions for question formulation are unknown.***

Interventions to improve question formulation in professional practice and self-directed learning: Horsley, Cochrane EPOC Group, 2010

## Using Local Opinion Leaders

Opinion Leaders are people who are seen as likeable, trustworthy and influential; they can use their influence to help and persuade others

- Opinion leaders delivered educational initiatives (meetings, materials)
- Many trials supplemented with audit & feedback, chart reminders
- Opinion Leaders delivering education generally ***leads to 12% absolute increase in compliance to evidence-based practice.***
- The ***effectiveness*** of opinion leaders ***is observed in single and multiple interventions, and for multidisciplinary opinion leaders.***

Local opinion leaders: effects on professional practice and health care outcomes: Foldgren et al, Cochrane EPOC Group, 2011

## Effective behaviour change strategies: EPOC reviews (Grimshaw et al, 2012)

Intervention	# studies	Outcome	Effect sizes
Printed Educational Materials Farmer et al, 2011	12 RCTs II non randomised studies	Median absolute improvement of care on process outcomes	4.3% Range (-8, 9)
Educational Meetings Forsetlund et al, 2009	81 RCTs 11,000 health professionals	Median absolute improvement of care	6.0% IQR (1.8, 15.3)
Educational outreach O'Brien et al, 2008	69 RCTs 15,000 health professionals	Median absolute improvement in prescribing, other behaviours	4.8% IQR (3, 6.5) 6.0% IQR (3.6, 16)
Local opinion leaders (& education) Flodgren et al, 2010	18 RCTs 296 hospitals 318 primary care physicians	Median absolute improvement of care	12% IQR (6, 14.5)
Audit & Feedback Ivers et al, 2012	140 RCTs	Risk difference in health professional compliance	4.3% IQR (0.5, 16)
Computerised Reminders Shojania et al, 2011	28 RCTs	Median absolute improvement of care	4.2% IQR (0.8, 18.8)

## *What do you need to review in your teaching?*

### Continuing Practice Development

- **Continuing education meetings and workshops:** effects on professional practice and health care outcomes: Forsetlund et al, 2009
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## Evaluating EBP teaching



### Does postgraduate teaching in EBM change anything?

#### OBJECTIVE:

To evaluate the effects of standalone versus clinically integrated teaching in evidence based medicine on various outcomes in postgraduates.

#### RESULTS:

**Standalone teaching improved knowledge** but not skills, attitudes, or behaviour.

**Clinically integrated teaching improved knowledge, skills, attitudes, and behaviour.**

#### CONCLUSION:

***Teaching of evidence based medicine should be moved from classrooms to clinical practice to achieve improvements in substantial outcomes.***

[BMJ](#). 2004 Oct 30;329(7473):1017.

What is the evidence that postgraduate teaching in evidence based medicine changes anything? A systematic review.  
[Coomarasamy A, Khan KS](#).

## Instruments for evaluating education in EBP

### CONTEXT:

Teaching of EBP should be evaluated and guided by evidence of its own effectiveness.

### DATA SYNTHESIS:

104 instruments identified: most used with medical students, postgrad trainees  
Skills of acquiring and appraising evidence were most commonly evaluated.

### CONCLUSIONS:

**Instruments with reasonable validity are available for evaluating some domains of EBP and may be targeted to different evaluation needs.**

[JAMA](#). 2006 Sep 6;296(9):1116-27.

**Instruments for evaluating education in evidence-based practice: a systematic review.**

[Shaneyfelt T, Baum KD, Bell D, Feldstein D, Houston TK, Kaatz S, Whelan C, Green M.](#)

**Table 1.** Characteristics of EBP Evaluation Instruments\*

Characteristics	Instruments, No. (%) (N = 104)
Participants' health care profession discipline and training level	
Students†	43 (41.3)
Postgraduate trainees‡	35 (33.7)
Practicing physicians	30 (28.8)
Nonphysicians§	13 (12.5)
EBP evaluation domains	
EBP knowledge	39 (37.5)
EBP skills	59 (56.7)
Ask	13 (12.5)
Acquire	35 (33.7)
Appraise	40 (38.5)
Apply	13 (12.5)
EBP attitudes	27 (26.0)
EBP behaviors	39 (37.5)
Performing EBP steps in practice	34 (32.7)
Performing evidence-based clinical maneuvers in practice	3 (2.9)
Patient outcomes	2 (1.9)

Abbreviation: EBP, evidence-based practice.

\*See Box for definitions. Categories are not mutually exclusive.

†Medical students (n = 43), dental students (n = 1), and nursing students (n = 1).

‡Internal medicine (n = 19), emergency medicine (n = 1), surgery (n = 2), obstetrics/gynecology (n = 3), pediatrics (n = 1), and family medicine (n = 8) residents.

§Nurses (n = 7), physical therapists (n = 1), researchers (n = 1), and not specified (n = 4).

Emergence of Domains for assessment

**EBP Knowledge**  
**EBP Skills**

Ask  
Acquire  
Appraise  
Apply

**EBP attitudes**  
**EBP behaviours**

Shaneyfelt et al, 2006

## EBP in postgraduate healthcare education

### BACKGROUND:

Systematic review of studies that assessed the effectiveness of EBP teaching & description of instruments available to evaluate EBP teaching.

### RESULTS:

15 outcomes within 10 studies for which effect size (E-S) could be calculated

Studies assessing skills, behavior and/or attitudes had "small to moderate" Effect sizes.

### CONCLUSION:

***Small improvements in knowledge, skills, attitudes or behavior are noted when measured alone.***

A large improvement in skills and knowledge in EBP is noted when measured together in a total test score.

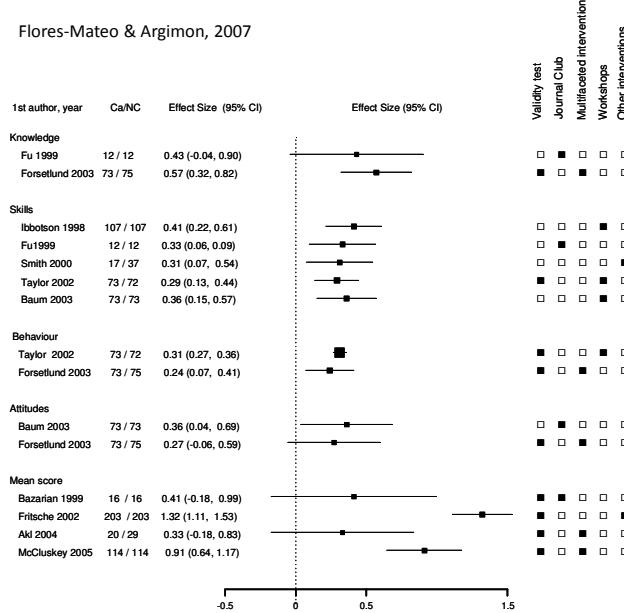
Very few studies used validated measures, tests.

[BMC Health Serv Res.](#) 2007 Jul 26;7:119.

**Evidence based practice in postgraduate healthcare education: a systematic review.**

Flores-Mateo G, Argimon JM.

Flores-Mateo & Argimon, 2007



## *What do you need to review in your evaluation of your teaching?*

### **Evaluation of Education in Evidence-Based Practice**

- *What is the evidence that postgraduate teaching in evidence based medicine changes anything?* A systematic review : Coomarasamy & Khan, 2004
- *Instruments for Evaluating Education* in Evidence-Based Practice A Systematic Review: Shaneyfelt et al, 2006
- *Evidence based practice in postgraduate healthcare education:* A systematic review: Flores-Mateo & Argimon, 2007

### **Education as a complex intervention**

- Education = built up of a number of components which may act independently and interdependently
- Positive result
  - Educational Intervention had a positive effect
- Negative Result
  - Was the educational intervention delivered as planned?
  - What the intervention ineffective?

Check MRC guidance Craig et al, 2008

## Why is education effective?



## Why is education effective?

### Importance of theory

- Theory = explanatory black box of why intervention works
- Useful theories
  - **Adult learning theory**
  - Self-directed learning
  - **Social cognitive theory** (Self-efficacy)
  - Reflective practice

## Adult Learning Theory

Knowles, 1978

- Establish a climate where learners feel safe and comfortable expressing themselves
- Involve learners in planning content and methods of what is taught
- Involve learners in diagnosing their own learning needs and formulating learning goals
- Encourage learners to identify relevant resources and learning strategies
- Support learners in practically solving problems
- Involve learners in evaluating their own learning

## Social Cognitive Theory: Bandura, 1977

- **self-efficacy** = belief in one's capabilities to organise & act to succeed in particular situations
  - influences the way tasks are approached, effort invested, persistence, confidence
- individual self-efficacy developed from
  - personal attainments
  - social modelling, observation
  - verbal persuasion (from a credible source)
  - internal emotional and physiological states
    - *Success builds self-efficacy while failure lowers it.*

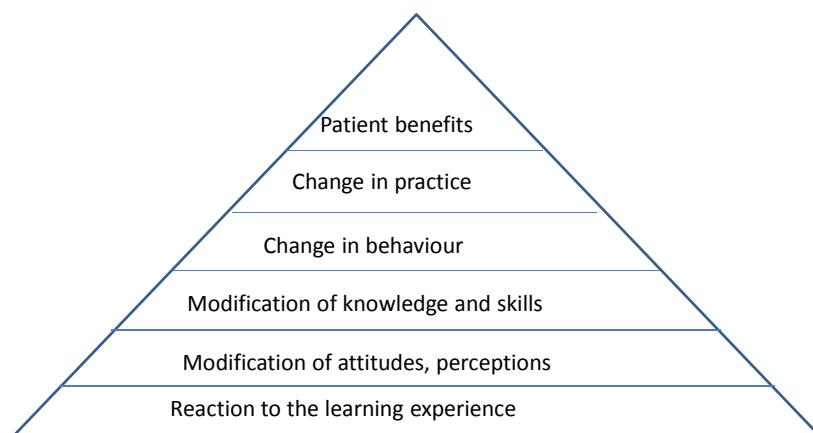
## *How do you use theories to support your teaching?*

- Theory = explanatory black box of why intervention works
- Useful theories
  - Adult learning theory
  - Self-directed learning
  - Social cognitive theory (Self-efficacy)
  - Reflective practice

## Evaluating learning?



## Kirkpatrick's model for learning



See Harris et al, 2011

## CREATE: A practical framework

- Consensus statement from International Conference EBHC Teachers and Developers, Sicily, 2009 = experience +evidence
- Aim to provide guidance for classification and development of EBP assessment tools
- Useful for designing assessment
- Validation ongoing mixed methods study

Assessment Category		Type of Assessment	Steps of EBP				
7	<b>Benefit to Patients</b>	Patient-Oriented Outcomes					
6	<b>Behaviors</b>	Activity Monitoring					
5	<b>Skills</b>	Performance Assessment					
4	<b>Knowledge</b>	Cognitive Testing					
3	<b>Self-Efficacy</b>	Self-Report/ Opinion					
2	<b>Attitudes</b>						
1	<b>Reaction to the Educational Experience</b>						

**CREATE**  
Classification Rubric for  
EBP Assessment Tools in Education

Ask	Search	Appraise	Integrate	Evaluate
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Audience Characteristics:

- Professional Students
- Clinicians
- Administrators
- Payers
- Policy Makers
- Patients
- Replicators
- Users
- Doers
- Interdisciplinary
- Specific discipline(s)

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- Cultural considerations

**Assessment Aims**

- Formative
- Summative

Tilson et al, 2011

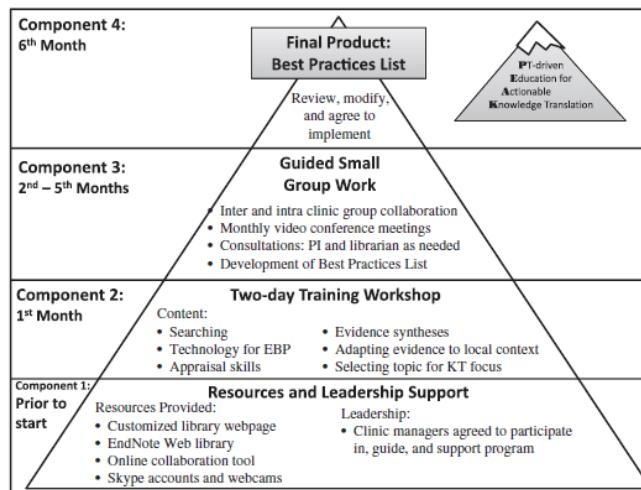
**Promoting physical therapists' use of research evidence to inform clinical practice: part 2 - a mixed methods evaluation of the PEAK program**

Assessment Category		Example Qualitative Questions	Quantitative Outcomes Assessed				
7	<b>Benefit to Patients</b>	Do you think patients have benefited?					
6	<b>Behaviors</b>	What about your skills and behaviors has changed?	EBP Implementation Scale				
5	<b>Skills</b>		Modified Fresno Test				
4	<b>Knowledge</b>	What have you learned?					
3	<b>Self-efficacy</b>	How do you use and view EBP? (indirect)	EBP Self-Efficacy Scale				
2	<b>Attitudes</b>		EBP Beliefs Scale				
1	<b>Reaction to the Educational Experience</b>	What did you enjoy about the fellowship?	Ask	Search	Appraise	Integrate	Evaluate

**CREATE**  
The Classification Rubric for  
EBP Assessment Tools in Education

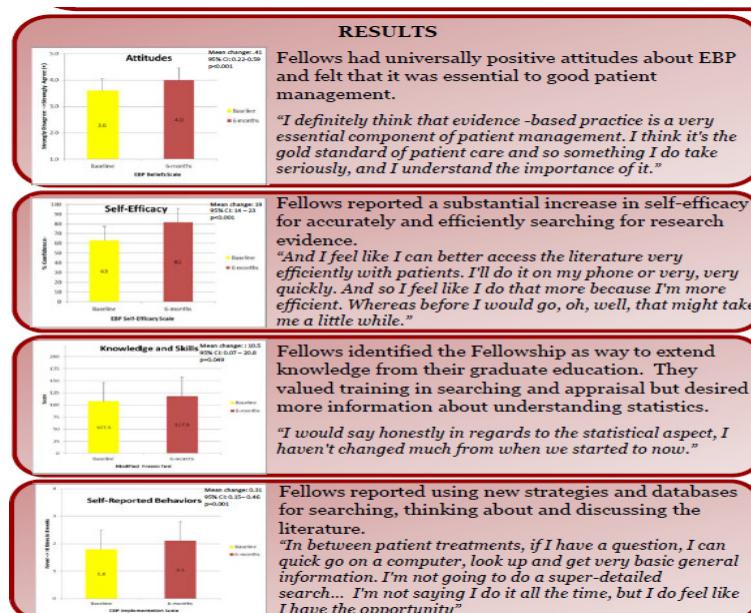
<http://www.evidencelive.org/sites/default/files/posters/2011-poster-sharon-mickan.pdf>

## Multifaceted Educational Program

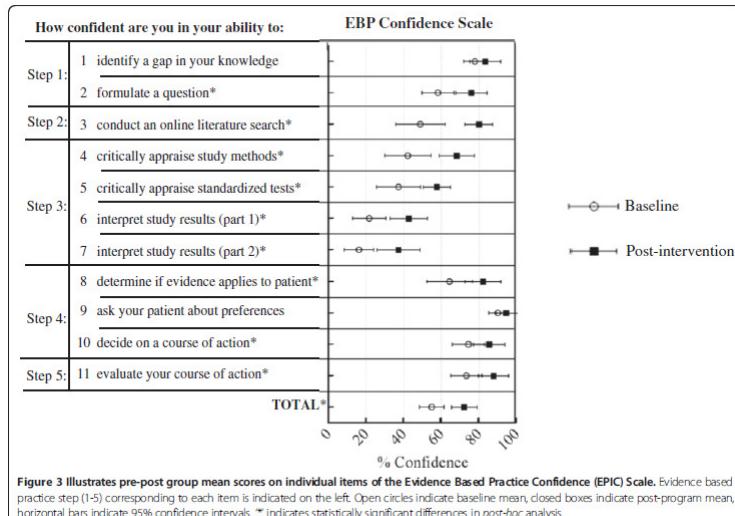


Tilson et al. BMC Medical Education 2014, 14:126

## Mixed methods evaluation of the PEAK program



## Comparative changes in self-efficacy: the PEAK program



Tilson et al. BMC Medical Education 2014, 14:126

## Top Tips Summary

1. Plan – design learning outcomes to meet needs of learners in their context
  - aim for positive **reaction to learning** experience
2. Use interactive learning experiences
  - engage via individual's use, views of EBP (**attitudes, self-efficacy, confidence**)
3. Include new **knowledge**, resources
4. Provide opportunity to develop **skills**
  - eg searching, critical appraisal
5. Integrate learning with clinical practice
  - practice new **behaviours**
6. Identify potential **benefits for patients**
7. PLAN TO EVALUATE EACH STAGE!!!