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Integration Of EBM Into Undergraduate Medical Curriculum Workshop

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FOUR QUESTIONS

WHY?
WHAT?
HOW?
IMPACT?
Introduction

Many medical schools around the world have incorporated EBM teaching into their curricula.
Evidence-based medicine (EBM) is a movement which aims to increase the use of high quality clinical research in clinical decision making.
Practice Of Evidence Based Medicine

1. Ask Clinical Questions
2. Acquire The Best Evidence
3. Appraise The Evidence
4. Apply the best Evidence
5. Assess Your Performance

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Objectives of the integration

- Clinical
- Behavior
- Skills
- Knowledge & Attitude
WHY?
Managing Medical Information Explosion

Daily:
2000 medical articles
75 RCTs
11 SR
PubMed: SR : > 5000
Increasing Information

Example: HTN

Articles

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Increasing Information

Example: HTN

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Why EBM approach?

Doubling time:

- In 1950, 50 years
- In 1980, 7 years
- In 2010, 3.5 years
- In 2020, 73 days!
Managing Medical Information Explosion

At the individual level:
1. Which resources
2. Proper searching skills
3. Appraisal, Interpretation and use
4. Point of care
5. Mobile medicine
6. Push & Pull
Medical Decision Making (MDM)

EBM approach Assists health professionals in guiding their decisions & manage uncertainty.
Quality Of Care & Patient Safety

EBM mandates the use of best current evidence practices that are effective, whilst eliminating those that are ineffective or harmful.
Major Accreditation Bodies

ACGME *(Accreditation Council for Graduate Medical Education)*

AAMC *(Association of American Medical Colleges)*

GMC *(General Medical Council)*

CanMEDS *(Royal College of Physicians & Surgeons of Canada)*
WHAT?
EBM Curriculum

Sicily statement 2005
Sicily Statement

This statement was conceived by the delegates of the second international conference of EBHC Teachers and Developers held in Sicily in Sep 2003 "Signposting the future of EBHC“
Sicily Statement

5 EBM steps
This five-step model forms the basis for both clinical practice and teaching EBP

“An immediate attraction of evidence-based medicine is that it integrates medical education with clinical practice”

Rosenberg and Donald; BMJ, 1995
Practice Of Evidence Based Medicine

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EBP Curriculum

Educational Outcomes

1. Translation of uncertainty into an answerable question
2. Search for and retrieval of evidence
3. Critical appraisal of evidence for validity and clinical importance
4. Application of appraised evidence to practice
5. Evaluation of performance
What Researches Say?

Although students of medicine at University of Split School of Medicine are taught EBM from the first day of their study and in all courses.

their experience of evidence searching and critical appraisal of the evidence, in real time with real patient in front of them is not large

What Researches Say?

Since its arrival to the scene of medicine and despite its worldwide incorporation into both undergraduate and postgraduate curricula, the implementation of evidence has been extremely slow.


Hassan IA: Moving from knowledge to practice: is it time to move from teaching evidence-based medicine (EBM) to knowledge translation competency? *Perspect Med Educ*, 2013 (2) 104-105


There are many barriers!!

But . . .

Is teaching the 5 steps sufficient to do the move from evidence to practice?
Miller Theory (Pyramid)

- **Knows**: Knowledge
- **Knows How**: How to apply knowledge
- **Shows How**: Patient: Demonstration of clinical skills
- **Does**: Daily patient care

Anatomy-Surgery Model

Basic Anatomy
Applied anatomy
Clinical (Surgery)
Beyond Appraisal Teaching

Applied EBM Science
Clinical EBM Practice

Slawson & Shaughenssy, J Assoc AMC, 2005
Ebell & Shaughenssy J Cont edu in health professional, 2003
Hassan IA, Prospectus med edu, 2013
Jane P. 2012
Lai 2009
1. Applied EBM Science

1. Point of care
2. Clinical Practice Guidelines
3. Knowledge Translation
4. Medical Decision Making
2. Clinical EBM Practice

Unless taught in clinical settings, it doesn’t work

Real Time EBM

✓ Post-call round
✓ Morning rounds
✓ Out-patient clinic
HOW?
Link Between Theory And Decision Making

A Norwegian study on undergrad: medical students & uptake of EBM principles may be positively modified if educators can demonstrate the link between competency in EBM & its direct influence on medical decision making

Pradly P et al, Evaluation Review, 2005
EBM
Teaching Methods
Clinically integrated teaching is more effective than theoretical teaching
A variety of methods exists for teaching and learning EBM. There is much debate about the effectiveness of various EBM teaching and learning activities. Two factors:

1. Clinical Vs. Classroom based (standalone)
2. Interactive Vs. Didactic
Empirical and theoretical evidence suggests that there is a hierarchy of teaching and learning activities in terms of their educational effectiveness:

A hierarchy of evidence-based medicine (EBM) teaching and learning

**Level 1:**
Interactive, and clinically integrated teaching and learning activities

**Level 2:**
(a) Interactive, classroom based teaching and learning activities
(b) Didactic, but clinically integrated teaching and learning activities

**Level 3:**
Didactic, and classroom or standalone teaching and learning activities

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STANDALONE DIDACTIC TEACHING

EDUCATIONAL NEED
- No active learning need assessment
- Learner receives topic from course organizers
- Lack of clinical context

REINFORCEMENT OF LEARNING
- In the absence of a clinical context acquired knowledge, if retained, is seldom applied to patient care.
- There is no active strategy to remove barriers at workplace

TEACHING & LEARNING
- Educational content delivered by teacher without interaction
- Knowledge and skills taught in hypothetical case scenarios
- The practicalities of EBM cannot be grasped
- Lack of learner activity encourages superficial learning

USE OF INFORMATION TAUGHT
- Information is quickly forgotten
- It cannot be easily retrieved when required
EDUCATIONAL NEED
- Learning needs determined by learner’s requirements
- Learner identifies a real clinical problem
- Evidence is sought actively

REINFORCEMENT OF LEARNING
- Practical use of acquired knowledge and skills reinforces deeper learning
- Resolution of clinical problems emphasizes relevance of learning
- Barriers are identified and dealt with at workplace

TEACHING & LEARNING
- Learner activity encourages deep learning
- Knowledge and skills learned while solving real clinical problems
- Ward round, Journal clubs, case discussions all used to learn how to incorporate evidence into practice

USE OF INFORMATION LEARNT
- Information is directly relevant to practice
- If stored electronically or included in local guidelines, can be easily retrieved and applied

INTEGRATED INTERACTIVE TEACHING
Long-term teaching is more effective than short-term courses

Green 1997
A spiral model is not simply the repetition of a topic taught. It requires also the deepening of it, with each successive encounter building on the previous one.
Levels of difficulty are increased, new learning is related to previous learning, and the students’ competency is increased.
Khan’s Hierarchy Needs To Be Expanded

Khan’s hierarchy is suitable for CME and CPD curricula

Two more factors for undergraduate

1. Curriculum Contents
   (Basic/Applied/Clinical)

2. Longitudinal (Spiral Vs. Single course)
Teaching Patterns

Green’s literature review of approaches to teaching EBM revealed few important modalities to teachers of EBM:

1. Small-group, learner-centered format
2. Immediate clinical relevance (Real time EBM)
3. Role modeling of EBM

Green 1997
Immediate Clinical Relevance

Any opportunity at different setting to discuss, explain, and challenge students with EBM interpretation:

Search the secondary EBM resources

Sn, Sp, LHR, SnOUT, SpPIN ??
RR, NNT ??

Applicability of the results to a specific patient?
Role Modeling Of EBM

When the trainer applies EBM on his daily practice, students consider it the norm and they will follow his steps.

One of the barriers to implementation is the disengagement between senior clinicians & EBM.
EBM should be clearly incorporated in the curriculum as part of the clinical training.

Radack & Valanis University of Michigan 2001
• Unless clearly incorporated in the clinical curriculum (with assessment scores)

• The other clinical demands of students will overpower their attention

Impact
Systematic Review

23 studies (RCTs & NRCTs)
It compared:

- Classroom (Standalone)
- Clinically integrated teaching.

Coomarasamy A, Khan K, 2004
Classroom-based Vs. Clinical-based

- Both improved knowledge
- Clinically integrated improved attitude, behavior and skills

Coomarasamy A, Khan K, 2004
• Teaching the principles of EBM to medical students increases knowledge, improves critical appraisal skills & attitude in both undergrad & postgrad

Coomarsamy A & Khan K, BMJ 2004
BradlyP et al, Med Edu 2005
Ghali WA et al, Med Edu 2000
Smith CA et al, JGIM, 2000
Parks J et al, Cochrane rev Database, 2001
Widyahening IS et al, Prospect Med Edu, 2012
Impact of Teaching EBM on Undergraduate

- SR of 17 studies of effectiveness of instruction in critical appraisal.
- Result: interventions implemented in the undergraduate programs resulted in significance gains in knowledge.

The principles & application of EBM is perceived by medical students to be important in both their current clinical training & perceived future work as clinicians

Dragan I & Kristian F, BMC Med Edu, 2010
Improves KAP

• A systematic review that includes two RCTs of teaching EBM to undergraduate medical students showed that EBP knowledge, skills and behavior has improved significantly.

(Ilic D, 2009)
Summary

• EBM approach assists managing Info explosion
• Sicily Statement Plus Applied and Clinical EBM
• Four Factors to consider when assessing EBM curriculum
  1. Clinical Vs. Standalone
  2. Interactive Vs. Didactic
  3. Curriculum Contents
  4. Spiral Vs. Single course
THANK YOU

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