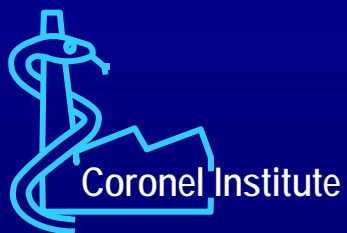


Testing knowledge and skills in EBM

Nathalie Hugenholtz
Coronel Institute of Occupational Health



EASOM Summer school 2008: Teaching Evidence-Based Occupational Medicine



5 Steps of EBM

1. Define an answerable question

- Does light cause discomfort to migraine sufferers in between attacks?

2. Search the literature

- Medline through PubMed

3. Critically appraise the results

- Read and judge articles

4. Apply the results to practice

- Is this patient different from those in the article?

5. Evaluate

- Was my approach effective?



Pyramid of Miller

Assessment of EBP progress involves:

1. Knowledge:

Knowing – assessed with knowledge tests

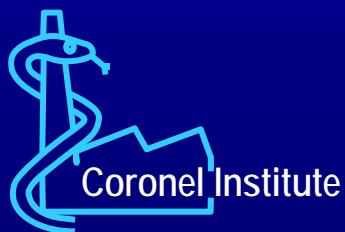
2. Skills/competence

Knowing how – assessed with case-based tests

3. Performance & action

Showing how – assessed with performance tests

Doing – assessment very difficult



EBP teaching evaluation instruments

Systematic Review:

“Instruments for Evaluating Education in Evidence-Based Practice”

By Shaneyfelt T, Baum KD, et al., JAMA. 2006;296:1116-1127.

347 articles were identified, 115 were included, representing 104 unique instruments



Review results

The Fresno Test¹ and Berlin Questionnaire² represent the only instruments that evaluate most of the EBM steps

¹ *Ramos KD, Schafer S, et al., 2003*

² *Fritsche L, Greenhalgh T, et al., 2002*



Fresno Test vs Berlin Questionnaire

- **In taking the Fresno Test, trainees perform realistic EBP tasks, demonstrating applied knowledge and skills. However, more time and expertise are required to grade this instrument**
- **The multiple-choice format of the Berlin Questionnaire restricts to EBP applied knowledge questions but makes it more feasible to implement**



Fresno Test: Contents

1. Knowledge

12 true/false questions

2. Skills

Two cases with fill-in-the-blank questions

- 6 case-specific questions (based on 1 of the cases, abstract of a relevant article included)
- 4 general questions



Fresno Test:

- **Designed for clinical-physicians**
- **In favour of our international EBM e-learning study → re-designed some of the knowledge questions, cases and corresponding article**



Fresno Test: Knowledge questions

Knowledge test:

- *Within EBM, expert opinion is not considered as a form of 'evidence'*

FALSE

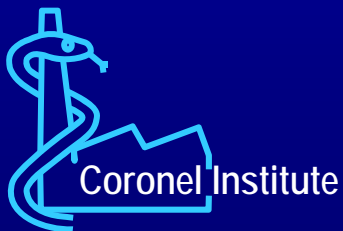
- *An etiological question is best answered through the use of a cohort study*

TRUE



Fresno Test: Case

A 54-year old bank employee consults you after a sickness absence of six weeks caused by a myocardial infarction (MI). A slightly higher cholesterol level is the only risk factor for MI that he had. He discussed this with his general practitioner and together they concluded that the high stress level at his workplace was the most important cause of the infarction. The employee works at a department that has been subject to insecurity and reorganisations for 10 years now. The employee asks you about the possibility that his MI was work-related.



Fresno Test: Case question

Formulate one concrete health question for this case that helps you to conduct a systematic literature search in order to answer it



Fresno Test: Case answer

	Patient	Intervention/ Exposure	Comparison	Outcome
Excellent (3 points)	> 1 appropriate descriptor	Specific intervention	Specific intervention	Objective, patient-oriented
Strong (2 points)	1 appropriate descriptor	Type of intervention	Type of intervention	Surrogate marker
Limited (1 point)	Descriptor lacking specificity	Intervention	Comparison	Non-specific outcome
Not Evident (0 points)	None of above	None of above	None of above	None of above



Fresno Test: Article

Rosengren A, Hawken S, et al. Lancet. 2004 Sep 11-17;364(9438):953-62.

‘Association of psychosocial risk factors with risk of acute myocardial infarction in 11119 cases and 13648 controls from 52 countries (the INTERHEART study): case-control study’

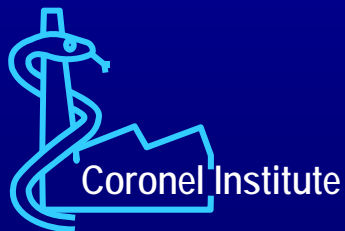
Conclusion:

Presence of psychosocial stressors is associated with increased risk of acute myocardial infarction, suggesting that approaches aimed at modifying these factors should be developed.



Fresno Test: Case/article question

Which aspects of the research described in the article would you study to determine whether the results described in the article are valid? Please, use as many arguments as possible



Fresno Test: Case/article answer

	Validity
Excellent (24 pts)	Lists or describes at least 5 issues important to internal validity, such as: <ul style="list-style-type: none">•Appropriateness of study design•Adequacy of blinding•Allocation concealment•Randomization of group assignment•Intention to treat analysis•Importance of follow-up of all study participants•Appropriate statistical analysis•Sample size / Power•Sponsorship, etc.
Strong (18 pts)	Identifies 3-4 specific issues as above.
Limited (10 pts)	Identifies 2 specific issues as above.
Minimal (5 pts)	Mentions internal validity or lists one specific concept from examples above.
Not evident (0 pts)	None of the above present



Fresno Test:

- **Essay questions allow assessment of a higher level of learning than recognition**
- **Grading can be difficult and subjective**
- **Rubrics standardize the grading of essay answers, make it easier and more objective**



Thank you for your attention!

n.i.hugenholtz@amc.uva.nl

