Fresno Test of Evidence Based Medicine

Grading Rubrics (Form A)

The practice of Evidence-Based Medicine (EBM) involves some basic knowledge and skills related to searching and evaluating medical literature. This UCSF-Fresno Medical Education tool is designed to assess the level at which you are already utilizing EBM skills. Please complete the entire test in one sitting. There are 7 short answer questions, 2 questions that require a series of mathematical calculations, and three fill-in-the-blank questions. Allow yourself at least 30 minutes to complete the test.

Answer questions 1-4 based on the following clinical scenarios:

- ered a healthy baby. She plans to breastfeed, but also wants to start oral contraception. You generally prefer to prescribe combination oral contraceptives (estrogen + progesterone) but you have been told that these might more negatively affect her breastmilk production than progesterone only pills.
- John is an 11 year old boy who presents with primary enuresis. He has grown frustrated with the inconvenience and embarrassment of his problem. You have excluded the possibility of urinary tract anomalies and infection as possible causes. You consider recommending a bedwetting alarm, but a colleague tells you he thinks they're "worthless" and suggests that you treat with imiprimine or desmopressin.

1. Write a focused clinical question for each of these patient encounters that will help you organize a search of the clinical literature for an answer and choose the best article from among those you find.

   Scoring Rubric for breast-feeding/contraception question. (When in doubt, consider whether what is written will contribute to an optimally specific search of the clinical literature.)

	Population	Intervention	Comparison	Outcome
Excellent (3 pts)	Multiple relevant descriptors e.g., "post partum woman," "breast feeding/lactating mother" or "breastfeeding mom desiring contraception," or "breast	Includes specific intervention of interest; e.g. *combined* contraceptives (estrogen and	Identifies specific alternative of interest since pt. wants to use *oral* contraception e.g. *progesterwith infant satiety or milk flow*	

fed newborn"

Note: "breastfeeding

Not Evident (0 pts)	None of the above present	None of the above present	None of the above present	None of the above present

2. Where might clinicians go to find an answer to questions like these? Name as many possible types or categories of information sources as you can. You may feel that some are better than others, but discuss as many as you can to demonstrate your awareness of the strengths and weaknesses of common information sources in clinical practice. Describe the most important advantages and disadvantages for each type of information source you list.

	Variety of Sources	Convenience	Clinical Relevance	Validity

Excellent (6 points)	At least four types of sources listed. Types include: • electronic databases of original literature (Medline, Embase, CINAHL) • journals (JAMA, NEJM) • text book (Merck, Harrisons, monographs) • Systematic Reviews (Cochrane) • EBM publications or databases of pre-appraised information (Best Evidence, InfoRetriever, DynaMed, EBM, ACPJC, EBP, Clinical Evidence) • Medical website (MDConsult, PraxisMD, SumSearch) • General internet search (google, yahoo) • Clinical Guidelines (Guideline Clearinghouse, • Professional Organization (AAFP, La Leche League, NIH website) • People (colleague, consultant, attending, librarian)	Discussion includes at least 2 specific issues related to convenience, or mentions the same issue while discussing two different sources. Issues may include: • Cost (e.g. "free," "subscription only") • Speed (e.g. "fast," "takes time") • Ease of search (e.g. "must know how to narrow search," "easy to navigate") • Ease of use (e.g. "concise" and "NNTs already calculated") • Availability (e.g. "readily available online")	Discussion includes at least 2 specific issues related to relevance, or mentions the same issue while discussing two different sources. Issues may include: • Clinically relevant outcomes • Written for clinical application (e.g. "pertinent" "info on adverse effects" or "has patient information sheets") • Appropriate specialty focus (e.g. "directed at FPs") • Information applicable to patient in question (e.g. "can go over details of this particular patient" or "most of studies are from Europe") • Includes specific interventions in question • Specificity (overview vs. targeted) (e.g. "can get basic

well as a method of delimiting.

	gets placebo…"	or "avoid selection bias" or "to be objective" or "to eliminate bias"
Limited (6 pts)	Describes or names a less desirable study design: e.g. "Cohort study" or "Prospective clinical trial" or meta-analysis of such studies, "longitudinal" or "prospective"	Justification is present, and raises legitimate issues unrelated to randomization or blinding, such as cost effectiveness, ethical concerns, recall bias. May mention randomization or blinding but without explanation. (e.g. "best in a random and blind setting") e.g. "impossible to recruit women to get a placebo instead of birth control" or "chart reviews provide lots of data without much cost"

	The Question	Description of Subjects
Excellent (12 points)	Well-reasoned and thoughtful discussion of the relevance of the independent and dependent variables used in the study including **examples/specific reasons**. May refer to: • the feasibility of the test or intervention *e.g. "the test might work but if my practice can't afford to buy the machine it doesn't matter"* • the patient or disease-oriented nature of the outcome *e.g. "did they measure dry nights after a week or after several months?" or "should measure infant growth, not just amount of milk produced"* • the congruence between the operational definition and the research question *e.g. "whether their method of measuring the outcome is a realistic representation of the outcome we care about"*	Includes both: • A clear expression of the importance of the link between the study subjects and target population. • At least one example of a relevant disease or demographic characteristic *e.g. "were the patients similar to mine in terms of age and race?" or "was it a hospital or clinic sample like my patients?" or "did patients have same level of disease severity as my patient?" or "did selection or inappropriate inclusion criteria result in a study population that differs from mine by race, age,etc"*
Strong (9 points)	Less thoughtful discussion of the relevance of the independent and dependent variables used in the study. May include specific concepts or examples without clear rationale. May refer to: • the feasibility of the test or intervention *e.g. "is it feasible?" or "can I actually use it?"* • the patient or disease-oriented nature of the outcome *e.g. "look for patient-oriented outcomes" or "does the outcome matter to my patient?"* • the congruence between the operational definition and the research question *e.g. "did they measure what they set out to*	Includes one but not both: • A clear expression of the importance of the link between the study subjects and target population. • At least one example of a relevant disease or demographic characteristic *e.g. "is the patient like mine?" or "education level of population"*

	study?" or "what methods were used to determine lactation performance?"	
Limited (5 points)	Response **implies consideration** of how well the study addresses the question at hand, but offers little discussion about why this may be important *e.g. "what are the variables?"; "does it answer my question?"; "the*	

- Intention to treat analysis
- Consideration of appropriate covariates

	Magnitude	Statistical Significance
Excellent (12 pts)	Response must clearly discuss both: • clinical significance (*"what is the clinical significance?" or "how large a difference was found?")* • example(s) of effect size measurements *(e.g., specificity, sensitivity, likelihood ratio of a test, number needed to treat, relative risk, absolute risk reduction, mean difference for continuous outcomes, positive or negative predictive value)*	Well-reasoned and thoughtful discussion of the indices of statistical significance, including at least 2 specific examples of important related concepts such as: • p-values • confidence intervals • power • precision of estimates • Type 1 or Type 2 error
Strong (9 pts)	Response discusses one but not both: • clinical significance (*"what is the clinical significance?" or "how large a difference was found?")* • example(s) of effect size measurements *(e.g., specificity, sensitivity, likelihood ratio of a test, number needed to treat, relative risk, absolute risk reduction, mean difference for continuous outcomes, positive or negative predictive value)*	Lists more than one concept (as above) with insufficient or absent discussion (e.g. "p-value and confidence intervals") OR Lists and discusses only one concept (e.g. "p-value less than <.05")
Limited (5 pts)	Response only suggests consideration of clinical significance or size of effect. *(e.g. "does it matter?" "will it impact my practice")*	Mentions need to assess statistical significance or names only one concept from above without further discussion (e.g. "p-values")

8. A recent study of the diagnostic accuracy of arterial blood gas in diagnosis of pulmonary embolus included 212 patients with suspected pulmonary embolus, 49 of whom were subsequently determined to have pulmonary embolus. Of those with pulmonary embolus 41 had abnormal alveolar-arterial oxygen gradient ((A-a)DO2). Of the 163 patients determined not to have pulmonary embolus, 118 had abnormal (A-a)DO2.

(4 points each)

- Based on these results, the sensitivity of (A-a)DO2 for pulmonary embolus is .837 OR 41/49
- Based on these results, the specificity of (A-a)DO2 for pulmonary embolus is .276 OR 45/163
- Based on these results, the positive predictive value of (A-a)DO2 for pulmonary embolus is .258 OR 41/159 OR 41/(41+118)
- Based on these results, the negative predictive value of (A-a)DO2 for pulmonary embolus is .849 OR 45/53 OR 45/(8+45)
- Based on these results, the likelihood ratio positive for an abnormal (A-a)DO2 for pulmonary embolus is 1.156 OR .84/(1-.28)

9. A recent randomized trial of found that 29% of diabetics with coronary heart disease (CHD) treated with pravastatin suffered a recurrent coronary event during 5 years of follow-up, while 37% of the placebo group suffered recurrent coronary events.

(4 points each)

- The absolute risk reduction for recurrent events is 8% OR .37-.29
- The relative risk reduction for recurrent events is 22% OR (.37-.29)/.37 OR .08/.37 OR 1-(.29/.37)
- The number needed to treat (NNT) to prevent one recurrent event is 12.5 OR 1/.08 OR 1/(.37-.29)

10. The recent HERS study compared women on estrogen supplements to women on placebo. Results revealed a relative risk of venous thromboembolic events is 2.89 for the women on estrogen. This suggests that estrogen treatment poses a coronary risk, but we wonder if this difference is statistically significant, so we look at the confidence interval. Give an example of a confidence interval that would support the conclusion that the rate of venous thromboembolic events was indeed (statistically) different for these two treatment groups. ___ *(anything that encompasses 2.89 and doesn't include 1.0)*

(4 points)

11. Which study design is best for a study about diagnosis? cross-sectional study OR "comparison of test with gold standard"

(4 points)

12. Which study design is best for a study about prognosis? cohort studies OR "prospective" OR "longitudinal"

(4 points)