Measuring the Impact of an EBHC Curriculum

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Context

University of California San Francisco Fresno Family Practice residency program

3-year program with 10 residents per class

Rural and urban settings

Background

- **Previously taught research through a required original research project**
- **No apparent impact on the clinical practice of our residents and faculty**
- **Shifted to practice-based curriculum focused more on consuming research rather than producing research**

New EBM Curriculum

- **Didactic**
  - **Online tutorial / Workshops**
  - **Critical appraisal sessions**
- **Question & Answer loop**
  - **PICO "prescription" pads**
  - **Search skills tutoring**
  - **Weekly Discussions / Newsletter**
- **Applications**
  - **Journal Club**
  - **COPC Activities**

Subjective Outcomes

EBM Curriculum helped me…	2002 (n=20)	2003 (n=22)
Focus clinical questions	**90%**	**100%**
Know where to look for answers	**85%**	**100%**
Search medline	**85%**	**95%**
Search Cochrane/integrative database	**70%**	**100%**
Critically appraise research	**80%**	**95%**
Use research in patient care	**80%**	**100%**
Monitor important new research	**55%**	**90%**
Develop clinical guidelines	**65%**	**----**

The Test We Wanted

- **Comprehensive**
- **Objective**
- **Performance-based**
- **Demonstrated reliability and validity**

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The Fresno Test

Premise: clinical scenarios

Calculation

- **Sensitivity**
- **Specificity**
- **PPV / NPV**
- **LR**
- **ARR / RRR**
- **NNT**

Short Essay

- **PICO**
- **Sources**
- **Design**
- **Searching**
- **Relevance**
- **Validity**
- **Effect Size**

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Grading Rubrics for Short Essay Questions

- **Essay questions allow assessment of a higher level of learning than recognition / more clinically meaningful**

- **But grading can be difficult and subjective**

- **Rubrics standardize the grading of essay answers, make it easier and more objective**

Sample Rubric:
Formulating a Clinical Question

	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

Reliability & Validity

- **Inter-rater Reliability**
  - **Interrater correlation = 0.98**
- **Internal Reliability**
  - **Cronbach's alpha = 0.88**
- **Construct Validity**
  - **Novice mean = 96 (out of 212) points**
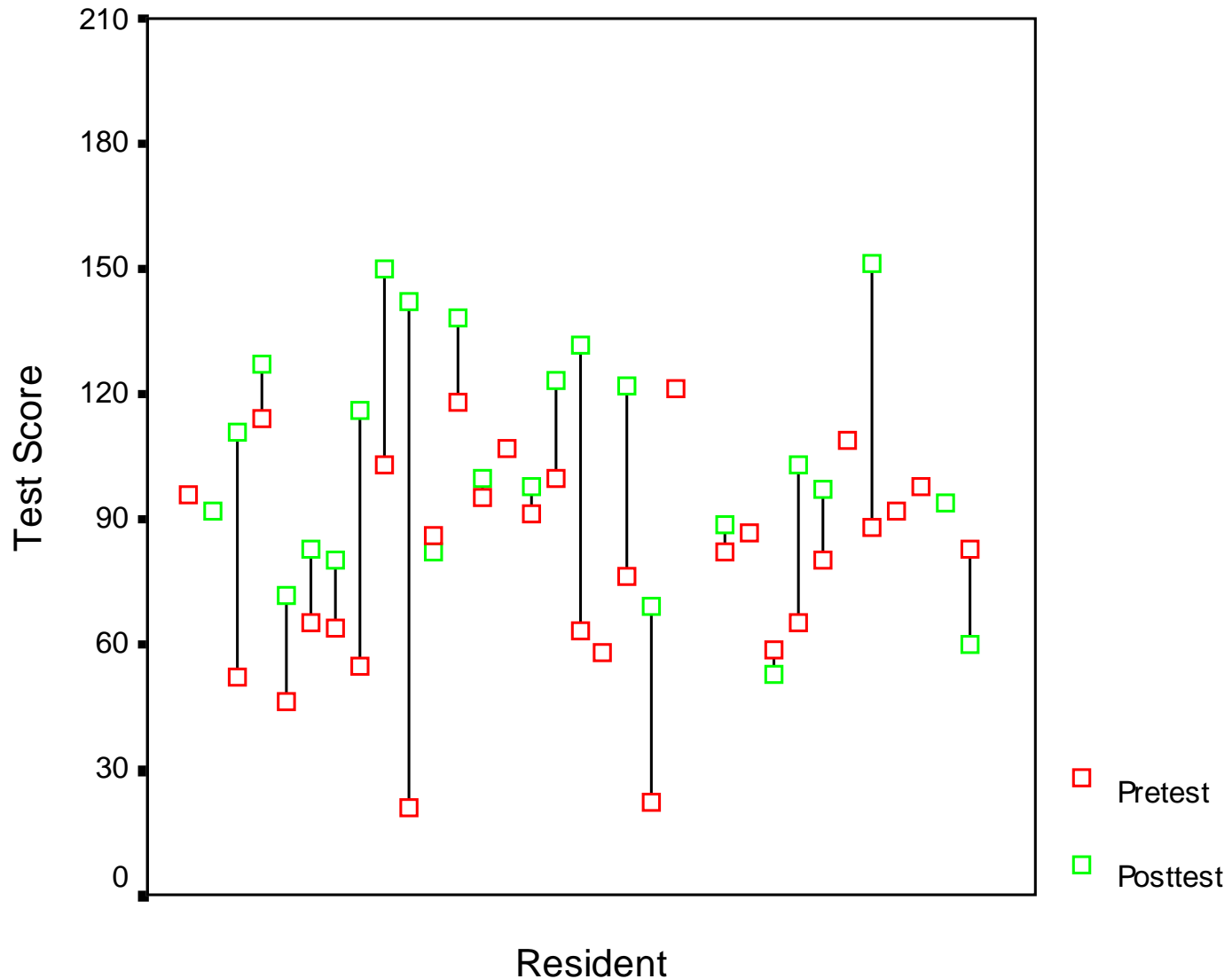 - **Expert mean = 148**

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Methodology

- **Two-year curriculum (interns experienced only one year)**

- **Everyone post-tested at the same time.**

- **Both pre and post data for 22 of 30 residents**

Total Test Scores

- **Repeated measures mixed analysis of variance**

- **Pretest Mean = 77; Post-test Mean = 104; $p < 0.001$**

- **19 residents improved.**

- **3 residents worsened.**

Individual Test Score Changes

Average Item Scores

Question	PreTest	PostTest	p-value
Focus clinical question (24 pts)	13	15	.061
Sources for answers (24 pts)	12	16	.083
Best study design (24 pts)	8	14	.001
Medline search skills (24 pts)	8	11	.036
Relevance (24 pts)	10	13	.151
Validity (24 pts)	13	12	.520
Magnitude & Significance (24)	5	10	.005
Calculations (40 pts)	7	14	.015

Links between participation in curriculum and outcomes

- **Data on participation in curricular components were harvested from resident files**
- **We tried to link participation and post-test scores**
- **The results were unclear**
  - **Curriculum evolved with our experience**
  - **Imprecise participation variables from archived data**

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Conclusions

- **A comprehensive EBHC curriculum resulted in objective improvement in our residents.**

- **We would like to be able to link specific participation variables to knowledge gains.**

- **Ultimately, we hope to identify how to teach EBHC in a way that measurably improves patient outcomes.**