

Evidence-based Dentistry

OS 512
 Research Design
 October 20,2003

What is evidence-based dentistry?

The “conscientious, explicit, and judicious use of the current best evidence in making decisions about the care of individual patients.”

----Sackett, et al., 1996

Why learn EBD?

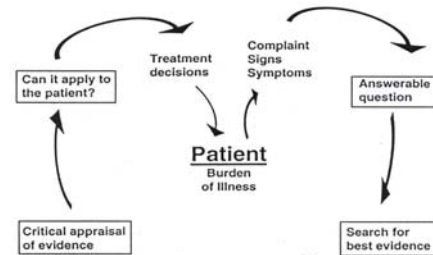
- You become an expert
- You become up-to-date
- You have
 - a rational basis for decision making
 - a way to counter the salesperson
 - a way to avoid the evangelism of the mesmerizing speaker

Is there a down side?

- More work
- Some hostility
- May not like the answer
 - May be no clear answer to question
 - Favored treatment may not have support

What is the process of EBD?

1. Start with a clinical problem
2. Formulate a searchable question
3. Perform a search
4. Evaluate the evidence from the search
5. Return to the clinical problem



Stolen from Ed Monaco, who can't remember where he stole it.

Hierarchy of Evidence

Pre-Experimental (case reports)
 Quasi-Experimental (non-random groups)
 True Experimental (randomized groups)
 Review Articles

Pre-Experimental Studies

Strength: Initial description of syndromes
 Weakness: Poor treatment evaluation
 Notable case report publications:
 Parkinson, 1817
 Costen, 1934
 Ramfjord, 1961
 Gottlieb, et al., 1981

Quasi-Experimental Studies

Strengths: Best available for diagnosis, sometimes only available option
 Weakness: Possible bias in treatment studies
 Notable example:
 (case control for smoking & cancer)

True Experimental Studies

Strengths: Can exclude most biases.
 Weakness: Effort and resources.
 Characteristics:
 Random assignment to treatment group
 Patient blind to treatment assigned
 Examiner blind to patient's treatment
 Withdrawals and drop outs described

Review Articles

Narrative
 Structured (or Systematic)
 Meta-Analysis

Narrative Review

Structure: Read some papers, write.
 Potential problem: Bias, omission of uncomfortable papers.
 Notable example (not biased):
 Mohl, et al. 1990

Structured Review

Search process & terms to locate papers.
 Inclusion & exclusion criteria.
 Table summarizing elements of papers.
 Notable example:
 T.M. Cummings and A.R. White, Needling
 therapies in the management of myofascial
 trigger point pain: a systematic review, Arch
 Phys Med Rehab 82: 986-992, 2001.

The Jadad Scale

Assessing the quality of reports of
 randomized clinical trials: Is blinding
 necessary?
 Alejandro R. Jadad and 6 others,
 Controlled Clinical Trials 17: 1-12, 1996

The Jadad Scale

One point for each "yes" answer to:
 Was the study described as randomized?
 If so, was the method stated and okay?
 Was the study described as double-blind?
 If so, was the method stated and okay?
 Were drop outs & withdrawals described?

Cummings and White, 2001

Search: 61 potential trials
 Excluded: 38, not myofascial pain or not
 true experimental design
 Scored: 5 points: 4 papers
 4 points: 3 papers
 3 points: 6 papers
 <3 points: 10 papers

Conclusions of Cummings and White, 2001

"... the effect was independent of the
 injected substance."
 "No trial ...[could] ... test the efficacy of any
 needling technique beyond placebo ..."

Meta-Analysis

Search: process, terms, inclusion criteria.
 Abstraction: Form. Tested. Agreement. Table.
 Quality: Scale. Tested. Quantitative.
 Statistics: Use statistical analysis to combine
 data to obtain an estimate of the overall effect
 of a particular procedure or variable on a
 defined outcome.

1987

Morley Rubinoff, Alan Gross, & W.D. McCall, Jr.

Conventional and nonoccluding splint therapy for patients with myofascial pain dysfunction syndrome.

General Dentistry 35: 502-506, 1987

1986

A.A. Antczak, J. Tang, & T.C. Chalmers

Quality assessment of randomized clinical trials in dental research I. Methods

J. Periodontal Research 21: 305-314, 1986

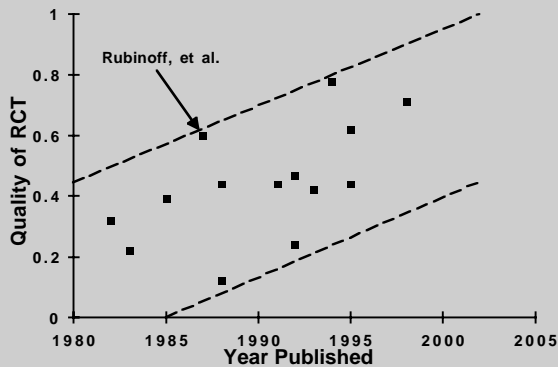
	adequate	fair	inadequate
Selection description	3	1.5	0
Rejection log	3	1.5	0
Therapy description	3	1.5	0
Placebo appearance	3	1.5	0
Follow-up schedule	3	1.5	0
Test compliance	3	1.5	0
Randomization blind	10	5	0
Patient blinded	8		0
Observer blinded			
to treatment	8	4	0
to results	4	2	0
Tested randomization	3	1.5	0
Tested blinding	3	1.5	0
Stopping rules	3	1.5	0
Estimated sample size	3	1.5	0
Error measurement	3	1.5	0

1999

H. Forssell, E. Kalso, P. Koskela, R. Vehmanen, P. Puukka, & P. Alanen

Occlusal treatments in temporomandibular disorders: a qualitative systematic review of randomized controlled trials

Pain 83: 549-560, 1999



Other Meta-Analyses

Rohling, et al., 1995

...financial compensation and ...chronic pain.

Effect size ($\Delta x/\sigma$) about 0.5 for quasi-experimental designs.

Other Meta-Analyses

Morley, et al., 1999

...cognitive behavior therapy ... for chronic pain ...

Median effect size 0.5 compared to waiting list controls.

Summary: The Meta-Analysis Process

Search: process, terms, inclusion criteria.

Abstraction: Form. Tested. Agreement. Table.

Quality: Scale. Tested. Quantitative.

Statistics: Use statistical analysis to combine data to obtain an estimate of the overall effect of a particular procedure or variable on a defined outcome.

Summary: Meta-Analysis in the Hierarchy of Evidence

Pre-Experimental (case reports)

Quasi-Experimental (non-random groups)

True Experimental (randomized groups)

Review Articles

Narrative

Structured or systematic

Meta-analysis

Summary: The Process of EBD

1. Start with a clinical problem
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