STRIVING FOR EXCELLENCE WITH EBD

Jane Gillette, DDS
What is excellence?
Overview

- Are we practicing with excellence of knowledge?
- Why does some science fail us?
- What do our patients consider evidence?
- Where do we find evidence?
- How do we communicate evidence with our patients?
I really don’t think I need to change the way I practice.

I already practice according to the evidence.
Science Changes

- Advances in science: new technologies which advance diagnostic and treatment modalities, refined research and statistical methods
- Sometimes science gets it wrong but that’s Ok, because…..

Research
Sam needs sealants!

“I’ve heard sealants cause cancer.”
Does “practice make perfect”? 

In a meta-analysis:

- 62 published studies that measured clinician quality of care and time since graduation
- 73% of those studies suggested that clinician performance declines over time.
- Only one study suggested improved performance.

Choudry 2005
Does “practice make perfect”? 

*Figure 2.* Distribution of study results relating physician age to clinical performance in various domains.
How do our evaluation skills change over time?

- **Use non-analytical thinking**
  - Rely on patterns of recognition to treat diseases
  - Tends to be efficient
  - Leads to pre-mature closer
  - Only works as long as the science does not change
    - Antibiotic prophylaxis for HM

- In testing situations, providers perform better in areas in which the science does not change much
How good are we at self-assessing our clinical knowledge deficiencies?

A SR of practitioner’s ability to self assess the level of their competency compared with external measures of their competency suggest clinicians:

- “…have limited ability to self assess”
- “Finally, perhaps of greatest concern are the findings that those who perform the least well by external assessment also self-assess less well.”

Not very good!!!!!
Is this me?
The volume of data

Annually:
20,000 journals
17,000 new books

MEDLINE:
4,000 journals
6 Million references
400,000 new entries yearly
Lies, Damned Lies, and Medical Science

Ioannidis

2005
Why does some science fail us?

- Lack of an *a priori question*
- Lack of a proper **control**
- Lack of **randomization**
- **Bias:**
  - Lack of blinding (both investigators and/or subjects)
  - Selection bias: only selecting studies that support the topic of interest
  - Publication bias: the fact that more studies with positive results get published
    - Encourages researchers to portray findings as more significant than they really are
    - Distorts the findings in the literature
  - Conflict of interest
  - Measurement bias: observer, responder and instrument bias
- Lack of statistical **“power”**
- Small **sample size**
Why does some science fail us?

- The use of **surrogate outcomes** (i.e. using “attachment loss” instead of tooth survival as an end point of a study)

- **Confounding**: when the association of an exposure (i.e. smoking) and the outcome (i.e. cardiovascular disease) is mixed up with the real effect of another exposure (i.e. periodontal disease) and the same outcome (i.e. cardiovascular disease)

- **Researcher degrees of freedom**: researcher bias and choices they make about which variables to include, when to stop collecting data, which comparisons to make and which statistical analysis to use and how results are presented can have a profound influence on the outcome of a study

- Even the way statistics are presented in a study can make a finding appear more significant than it really is

- *Researchers are evil* and can find an association between anything!!!!
Correlation between pirates and global warming
Retraction of articles in journals

![Graph showing retraction notices from PubMed and Web of Science from 1977 to 2009. The graph indicates an increase in retraction notices over time, especially after 2005.]

Below the graph, a bar chart shows the percentage distribution of retractions due to different reasons:
- **Self-plagiarism**: 11%
- **Honest error**: 28%
- **Other**: 11%
- **Fabrication or falsification**: 17%
- **Plagiarism**: 16%

The graph and bar chart together illustrate the trend and reasons for retractions in scientific journals.
Post-republication of retracted citations

Figure 1

Incidence of post-republication citation at four-, eight-, and twelve-year intervals
"Results of sealant studies have demonstrated that caries progression is inhibited under intact sealants. Sealants now are used widely as an approach in the nonoperative management of incipient or early occlusal caries."

...and yet only 37.4% of GPs and 42.3% of ped DDS utilize this approach to care
Are we practicing according to evidence?

There is insufficient evidence from clinical trials that use of agents containing calcium and/or phosphates with or without casein derivatives lowers incidence of either coronal or root caries.

NW PRECEDENT preliminary data
What is the “evidence” by which dentists make clinical decisions?

<table>
<thead>
<tr>
<th>Study</th>
<th>Odds ratio (95% CI)</th>
<th>% Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allaqaband</td>
<td>1.23 (0.39, 3.89)</td>
<td>9.2</td>
</tr>
<tr>
<td>Baker</td>
<td>0.20 (0.04, 1.00)</td>
<td>6.4</td>
</tr>
<tr>
<td>Briguori</td>
<td>0.57 (0.20, 1.63)</td>
<td>9.9</td>
</tr>
<tr>
<td>Diaz-Sandoval</td>
<td>0.11 (0.02, 0.54)</td>
<td>6.4</td>
</tr>
<tr>
<td>Durham</td>
<td>1.27 (0.45, 3.57)</td>
<td>10.1</td>
</tr>
<tr>
<td>Efrati</td>
<td>0.19 (0.01, 4.21)</td>
<td>2.5</td>
</tr>
<tr>
<td>Fung</td>
<td>1.37 (0.43, 4.32)</td>
<td>9.2</td>
</tr>
<tr>
<td>Goldenberg</td>
<td>1.30 (0.27, 6.21)</td>
<td>6.7</td>
</tr>
<tr>
<td>Kay</td>
<td>0.29 (0.09, 0.94)</td>
<td>9.1</td>
</tr>
<tr>
<td>Kefer</td>
<td>0.63 (0.10, 3.92)</td>
<td>5.5</td>
</tr>
<tr>
<td>MacNeill</td>
<td>0.11 (0.01, 0.97)</td>
<td>4.2</td>
</tr>
<tr>
<td>Oldemeyer</td>
<td>1.30 (0.28, 6.16)</td>
<td>6.7</td>
</tr>
<tr>
<td>Shyu</td>
<td>0.11 (0.02, 0.49)</td>
<td>6.9</td>
</tr>
<tr>
<td>Vallero</td>
<td>1.14 (0.27, 4.83)</td>
<td>7.3</td>
</tr>
<tr>
<td>Overall (95% CI)</td>
<td>0.54 (0.32, 0.91)</td>
<td></td>
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</tbody>
</table>
Can misuse of treatment harm patients?

- Adverse pediatric sedation events (mostly death) = 34% dental setting (Cote 2000)

- Death of patients after discontinuation of anticoagulation before oral surgery (Jeske 2003, Wahl 2000)

- The public gives self regulation to our profession and in return demands rightly that we continually strive to practice to the highest level of evidence

YES!!!!
Let’s play dental Jeopardy !!!!
A therapy that even though it seems plausible when given orally to expectant mothers does **not** produce less caries in children.

*What is prenatal fluoride?*
A protective dental material that has improved quality and longevity when resin bonded in place.

What is a resin bonded sealant?
A preventive practice in dentistry with insufficient evidence to support 6 month periodicity.

What is dental recall and prophylaxis?
Components of EBD?

- Highest level of evidence
- Patient preferences & values
- Clinical expertise

Graded: Validity Importance Bias
What do patients believe is evidence?
What do patients believe is evidence?

- In vitro study
- Sponsored by the “California Raisin Marketing Board”
- Even educated patients may not understand the importance of:
  - Human trials
  - Sponsorship
  - One study is not enough to base health care decisions on
Meet Roger

Roger has sensitive teeth!

Maybe he should use Sensodyne?

Roger works in “risk management”
What do patients believe is evidence?

There is not enough research to support potassium nitrate as a treatment for dentinal hypersensitivity. More research is needed.
What do patients believe is evidence?

**summary**

No strong evidence supports the efficacy of potassium nitrate toothpaste for dentine hypersensitivity

Implementing EBD in practice

- Create an EBD learning environment
Create an EBD Learning Environment

- Dental Team EBD Study Club
- Compensation/reward system for EBD learning participation
- Rate level of evidence of procedures, protocols and programs
Benefits of Training Staff

Engaging and empowering staff

- Deepens interest in dentistry
- Improves consistency of care and communication with patients
- Increases investment in the practice

Staff who are competent in EBD search strategies can help distribute the burden of “work” associated with finding evidence
EBD Staff Training

EBD Training Workbooks
Sharing Evidence

- **Staff**
  - Share findings regularly at staff meetings
  - Store findings where all staff can access information

- **Patients**
  - Develop a synopsis
  - ADA Plain Language Summaries
  - Present data with case presentation
  - After hours or chair-side
Implementing EBD in practice

- Create an EBD learning environment
- Rate level of evidence:
  - Top volume procedure codes
  - Standard Operating Procedures (SOP)
  - Quality assurance (i.e. chart reviews)
  - Programs (i.e. school-based program)
  - Political advocacy
Finding evidence you can trust

1. Ask your question
2. Search preappraised evidence & other high quality evidence:
   - EBD.ADA.org, DARE Abstracts
   - Cochrane Collaboration
   - Journal of Evidence-based Dental Practice, Evidence-based Dentistry
3. Search non-preappraised evidence:
   - PubMed: focus on SR and RCT
   - Critically appraise non-preappraised
Rating of Top Volume Procedure Codes

What are 2 of most common preventive dental encounters in dentistry?

- What is the evidence for a 6 month recall exam interval in adults?

- What is the evidence for a 6 month interval of scaling and polishing in adults?
Implementing EBD in practice

- Create an EBD learning environment
- Rate level of evidence:
  - Top volume procedure codes
  - Standard Operating Procedures (SOP)
  - Quality assurance (i.e. chart reviews)
  - Programs (i.e. school-based program)
  - Political advocacy
- Translate findings into practice
Translating finding is like learning trapeze....
Sharing EBD with patients
Thank you!

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