Evidence-based Dental Practice
- A Global Revolution

Derek Richards
Director, Centre for Evidence-based Dentistry, DHSRU, Dundee
Consultant in Dental Public Health, South East Scotland
This lecture will provide a brief outline of the development of EBD and address three main issues:

- Why we need it?
- What are its successes to date?
- What are the future challenges?
Evidence-based Dentistry

ADA Definition:

- EBD is an approach to oral health care that requires the judicious integration of:
  - systematic assessments of clinically relevant scientific evidence, relating to the patient’s oral and medical condition and history,
  - with
  - the dentist’s clinical expertise and
  - the patient’s treatment needs and preferences
Evidence-based Practice

Best Evidence

Clinical Experience

Patient Values

EBP
Why?

- Not a new idea
- Information overload
- Focus on quality and consistency
- Avoid unnecessary treatment
- Questioning attitude to traditional beliefs
- Lifelong learning
- Patient empowerment
- Resources finite
Information overload

Search using term ‘dental’

- **Google** - > 356 million hits
- **Pubmed (Medline)** - 458,163
- **Cochrane library** - 15567
  - Reviews - 179
  - DARE - 559
  - Central - 16412
  - HTA - 96
  - NHSEED - 102

Searches conducted 06-09-19
A brief history of Evidence-based Health Care

- 1990s
- Cochrane Collaboration
- Centre for Evidence-based Medicine
- Centre for Evidence-based Dentistry

http://ebm.jamanetwork.com/
International Society for Evidence-based Health Care

THE FOUNDING BOARD MEMBERS are:

- Kameshwar Prasad (India),
- Gordon Guyatt (Canada),
- Paul Glasziou (Australia),
- Carl Heneghan (UK),
- Ken Kuo (Taiwan),
- Nino Cartabelotta (Italy),
- Jose Emparanza (Spain),
- Hilda Bastian (Germany),
- Lubna A. Al-Ansary (Saudi Arabia),
- Dave Davis (Canada),
- Sally Green (Australia),
- Regina Kunz (Switzerland),
- Peter Tugwell (Canada),
- Mahmoud El Barbary (Saudi Arabia),
- Victor Montori (USA).

http://www.isehc.net/
1972 – “people who want to make more informed decisions about health care do not have ready access to reliable reviews of the available evidence.”

1979 "It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomized controlled trials".
Cochrane Collaboration

- Cochrane has representatives in more than 43 countries
- **Europe**
  - Chief Executive Officer's Office
  - Dutch Cochrane Centre
  - French Cochrane Centre
  - German Cochrane Centre
  - Iberoamerican Cochrane Centre
  - Italian Cochrane Centre
  - Nordic Cochrane Centre
  - UK Cochrane Centre
- **Asia-Pacific**
  - Australasian Cochrane Centre
  - Chinese Cochrane Centre
  - South Asian Cochrane Centre
- **North and South America**
  - Brazilian Cochrane Centre
  - Canadian Cochrane Centre
  - US Cochrane Center
- **Africa and the Middle East**
  - South African Cochrane Centre

www.cochrane.org/contact/centres
Cochrane Oral Health Group

- Established in 1993
- One of over 50 review groups
- 1500 members
- 40 different countries
- 157 reviews
- 49 protocols

http://ohg.cochrane.org/
Centre for Evidence-based Dentistry

- Established following a workshop in Oxford December 1994
- To promote the teaching, learning, practise and evaluation of Evidence-based Dentistry
- www.cebd.org

Evidence-based Dental Centres

- Cochrane Oral Health Group
  Manchester
- Dundee – formerly Oxford
- London UCL – ICEBOH
- New York – formerly Boston
- ADA–Chicago
- Egypt – Cairo University
Education and Dissemination

- Raising awareness of EBD
- Teaching appraisal skills
- Evidence synthesis
  - Guideline development
  - Journal
  - Online
Evidence-based Dentistry Journals

- EBD First published as supplement to BDJ - Nov. 1998
- Becomes stand alone in 2000
- Evidence-based Dental Practice launches 2001
The Dental Elf Service

- www.thedentalelf.net
- One of suite of blogs
  - Mental Health
  - Learning disability
  - Diabetes
  - Child
  - Commissioning
  - Education
  - Lifestyle
  - Musculoskeletal
  - Social Care
  - Stroke
- Highlighting good evidence
- http://www.nationalelfservice.net/
EBD in Dental Education

- GDC includes EBD in curriculum requirements
- Critical Appraisal incorporated into UK Dental postgraduate exams
- Council on Dental Accreditation’s (CODA) requirement that oral health educational programs integrate evidence-based dentistry
- Included in many undergraduate curricula
Increase in dental trials and reviews 1965-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>RCT</th>
<th>Systematic Rev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1970</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>1975</td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td>1980</td>
<td></td>
<td>1500</td>
</tr>
<tr>
<td>1985</td>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td>2500</td>
</tr>
<tr>
<td>1995</td>
<td></td>
<td>3000</td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td>3500</td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td>4000</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td>4500</td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td>5500</td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td>6000</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td>6500</td>
</tr>
</tbody>
</table>

Searches conducted 20-02-15
Challenges

- Quality of primary research
- Quality of secondary research
- Implementation
## Systematic Reviews in Dentistry

<table>
<thead>
<tr>
<th>Topic</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caries</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Fluorosis</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Oral &amp; Maxillofacial surgery</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Oral Health Promotion</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Oral Medicine</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Orthodontics</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Pain</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td>Periodontology</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Restorative Dentistry</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Sleep apnoea</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Temporomandibular disorders</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>65</strong></td>
<td></td>
</tr>
</tbody>
</table>

Weakness of the reviews

- Search strategies not always adequate.
- Only 12 reviews (19%) attempted to identify all relevant studies.
- Problems with:
  - screening and quality assessment of primary studies
  - the pooling of data
  - examination of heterogeneity
  - the interpretation of findings.

Are dental reviews improving?

- 157 - Orthodontic systematic reviews identified
- Gradual increase in number over time
- 27% involved a meta-analysis
- Average number of trials = 4 (2-52)
- Overall quality of evidence using GRADE criteria; low to very low

Orthodontic trials in the last 10 years

- Assessed 309 trials published in last 10 years

- Reporting quality has improved significantly
  - Identifying trial as randomised
  - Sample size
  - Blinding
  - Randomisation
  - A few items report well – majority poorly

- Need to more closely follow CONSORT guidelines

Evidence-based Guidelines

- SIGN
- NICE
- SDCEP (Scottish Dental Clinical Effectiveness Programme)
- American Dental Association
Implementation

- Delivery of preventive interventions poor despite previous guidelines and prevention programmes
  - SIGN 47, 83 & 138
  - DBOH toolkit
  - SDCEP – Prevention and management of caries in Children
  - Childsmile
Criticisms of EBM

- Criticism has ranged from evidence based medicine being old hat to it being a dangerous innovation, perpetrated by the arrogant to serve cost cutters and suppress clinical freedom.

Criticisms of EBM-

- Evidence based medicine is not "cookbook" medicine. Because it requires a bottom up approach that integrates the best external evidence with individual clinical expertise and patients'

Criticisms of EBM-

The evidence based “quality mark” has been misappropriated by vested interests

The volume of evidence, especially clinical guidelines, has become unmanageable

Statistically significant benefits may be marginal in clinical practice

Inflexible rules and technology driven prompts may produce care that is management driven rather than patient centred

Evidence based guidelines often map poorly to complex multimorbidity

**Actions to deliver real EBM**

- Patients must demand better evidence, better presented, better explained, and applied in a more personalised way.
- Clinical training must go beyond searching and critical appraisal to hone expert judgment and shared decision making skills.
- Producers of evidence summaries, clinical guidelines, and decision support tools must take account of who will use them, for what purposes, and under what constraints.
- Publishers must demand that studies meet usability standards as well as methodological ones.
- Policy makers must resist the instrumental generation and use of “evidence” by vested interests.
- Independent funders must increasingly shape the production, synthesis, and dissemination of high quality clinical and public health evidence.
- The research agenda must become broader and more interdisciplinary, embracing the experience of illness, the psychology of evidence interpretation, the negotiation and sharing of evidence by clinicians and patients, and how to prevent harm from overdiagnosis.

Real evidence based medicine

- Makes the ethical care of the patient its top priority
- Demands individualised evidence in a format that clinicians and patients can understand
- Is characterised by expert judgment rather than mechanical rule following
- Shares decisions with patients through meaningful conversations
- Builds on a strong clinician-patient relationship and the human aspects of care
- Applies these principles at community level for evidence based public health

In summary

- Increased
  - awareness of EBD
  - availability of EBD information
  - number trials, reviews and guidelines

- Methodological/reporting issues with dental research

- Challenges
  - Implementation
  - Education
  - Keeping ‘EBM real’