Prosthetic Dentistry
Teaching and research

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Aim of presentation – 1/4
• Clinical teaching of future dentists

Aim of presentation – 2/4
• Clinical teaching of future dentists
• Complexities involved in advanced prosthodontic care as a background for recognizing research priorities in prosthetic dentistry
Aim of presentation – 3/4
- Clinical teaching of future dentists
- Complexities involved in advanced prosthodontic care as a background for recognizing research priorities in prosthetic dentistry
- Practice based research as a meaningful way to generate data for making better treatment decisions

Aim of presentation – 4/4
- Clinical teaching of future dentists
- Complexities involved in advanced prosthodontic care as a background for recognizing research priorities in prosthetic dentistry
- Practice based research as a meaningful way to generate data for making better treatment decisions
- Why patient care have the potential to improve when research is conducted trans-disciplinary

University of Toronto
Faculty of Dentistry

Academic Plan
2004-2010

"Best Learning Dental Institute"
1. What the dentist is able to do ("technical intelligencies")

   • Clinical information gathering
   • Treatment planning
   • Treatment procedures

*RM Harden, 1999

2. How the dentist approaches their practice
   "intellectual, emotional, analytical & creative intelligencies"

   1. What the dentist is able to do ("technical intelligencies")

   2. "What they bring to the treatment of each patient"
      • Application of basic clinical sciences
      • Clinical reasoning and judgment
      • Communication
      • Health promotion
      • Attitudes, ethical stance and legal responsibilities
      • Information handling

3. The dentist as a professional "personal intelligencies"

   Clinical information gathering
   Treatment planning
   Treatment procedures
   Personal development
   The role of the dentist within the health service
   Communication
   Application of basic clinical sciences
   Clinical reasoning and judgment
   Health promotion
   Information handling
   Attitudes, ethical stance and legal responsibilities
Prosthodontics should be an integral part of comprehensive clinical training involving other clinical disciplines with an aim to...

achieve the minimum level of knowledge and skills in applying prosthodontic techniques, procedures and biomaterials to solve patients’ oral problems.

However...
Our responsibilities as educators is also to generate an ambition of life long learning and prepare them accordingly.
Do we today prepare our future colleagues to change behavior, attitude and methods in the lights of new knowledge?

How quickly do dentists change in accordance with new research?
Impacted wisdom teeth?
TMD management?
Restoration replacement needs?
Caries and remineralization potential

Science transfer to dentists seems to be ineffective

"...studies ....appear to motivate a more restrictive approach today compared with 10 years ago"
Science transfer to dentists seems ineffective...is the problem that...

...research is difficult to access?

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Dental Journals in circulation

Source: Ulrich’s International Periodicals Directory

700 active
200 ceased
100 merged

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Science transfer to dentists seems ineffective...is the problem that...

...research is difficult to access...or understand?
Science transfer to dentists seems ineffective ...is the problem that...

...research is difficult to access ... or understand?

But what about clinical guidelines?
is the problem that...
...research is difficult to access or understand?
...what about clinical guidelines?
Are the existing guidelines bad or inappropriate?
.... yes and no

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is the problem that...
...research is difficult to access or understand?
...clinical guidelines ...are they bad or inappropriate?
Are the practicing dental professionals non-receptive?
.... if so, who is responsible?
....and can something be done?

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http://www.agreecollaboration.org
1. A fundament for life long learning is to possess skills in critical appraisal
2. Critical appraisal of research must be an integral component of student training
3. Curriculums should progress from being PBL- to become EBD-based

All dental students should conduct at least one systematic review according to a PICO question because...

... conduct at least one systematic review because...

The student will
1. Identify differences in conclusions of studies and possibly grasp why
The student will
1. Identify differences in conclusions of studies and possibly grasp why
2. Recognize the state of current oral health research
3. Identify opportunities for research
4. Train to recognize potential bias caused by poorly executed research or due to inadequate reporting
Aim of presentation

• Clinical teaching of future dentists
• Complexities involved in advanced prosthodontic care as a background for recognizing prosthodontic research priorities

The training of prosthodontic specialist aims to:

Prepare the clinician how to recognize and solve patients’ needs for oral rehabilitation of a complex nature

…rehabilitation of complex situations

A prosthodontist is specially trained to manage patients: 

.. with complex rehabilitative needs
Appropriate patient management

1. Patient views and choice of values
2. Patient communication

3. Consideration of possible technical solutions
Would these patients be offered and choose similar technical solutions?

Appropriate patient management
1. Patient views and choice of values
2. Patient communication
3. Possible technical solutions
4. Realistic outcomes with different technical solutions

.. with complex rehabilitative needs
Acrylic partial denture

Clinical knowledge
- Prosthesis design
- Prognosis

Cast partial denture

Clinical knowledge
- Prosthesis design
- Prognosis
- Retention

Crowns + cast partial denture

Additional clinical knowledge
- 36 extraction or crown?
- Soldered 44 + 45?
- Milled crowns?
- Intra- or extracoronal attachments?
Conus bridge

Clinical knowledge:
47, 36, 45: extraction … gold coping … attachment? 43/44/45: separation?

Fixed bridge

Clinical knowledge:
Conventional alloy, titanium-ceramic or gold acrylic?
Zn-phosphate, GIC or resin cement?
Bridge extension 46? 46+47?

Implant retained prosthesis

Clinical knowledge:
One / two implants?
Wide collar - standard diameter?
Splintet - non-splintet FPD?
Cement / screw-retained?
Nobelbiocare, AstraTech, 3i, Endopore, Straumann, Friadent…?
More treatment options are available today than ever before.

...and in an aging population.

Unfortunately, many are on the limit or beyond economic realization by patients.

One consequence: A critical focus on what is achievable by prosthodontic therapy; i.e. Focus on outcomes.
Outcomes of prosthodontic therapy

a) Surrogate
b) Clinical
c) Patient relevant
e) Societal

Jokstad A, Brägger U, Brunski JB, Carr AB, Naert I, Wennerberg A

Quality of Dental Implants
Int Dent J. 2003; 53 Sup 2: 409-33
& Int J Prosthodontics 2004; 17: 607-641
Quality of Dental Implants

Background

More than 120 implant brands produced by about 60 manufacturers are commercially available worldwide. There are studies from different materials, looking at different surface treatments and contact in different shapes, sizes, lengths, width and form. The clinician can choose among more than 2000 implants.

FDI recognizes that:

- Implants made from titanium and titanium alloys appear to perform well clinically in properly selected prepared bone, regardless of small variations in design.
- The scientific evidence of the influence of dental implants on masticatory, psychic and cognitive processes is not fully established.
- Implants are manufactured and sold in some parts of the world without compliance to international standards.

It would seem prudent to rely on dental implants supported by sound clinical research documentation and which conform to the general principles of good manufacturing practice in compliance with the ISO standards set by FDA (Food and Drug Administration) and other regulatory bodies.

Outcomes of prosthodontic therapy

a) Surrogate
b) Clinical
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Use of the WHO ICIDH-2 terminology

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Research issues of interest in prosthodontics?

- Understanding of disease processes & organ development
- Diagnostic techniques & procedures
- Pain response, translation & management?

- Communication
- Patient behaviour
- Quality of life in societal context
- Patient-centered outcomes in trials
- Qualitative research
Research issues—healbilitation of complex situations

• Development of new preventive techniques, biomaterials and treatments
• Evaluation of effectiveness of therapies; i.e. doing more good than harm in relevant settings

We have almost no data from clinical studies undertaken in the setting of general practices

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• Complexities involved in advanced prosthodontic care as a background for recognizing research priorities in prosthetic dentistry
• Practice based research as a meaningful way to generate data for making better treatment decisions
Practice based research - challenges

1. Practical

Practical challenges:

Is there a willingness to carry out practice based research amongst Canadian dentists?
Evidence that prosthodontic therapy do more good than harm needs to be demonstrated using adequate study designs.
Can Randomised Controlled Trials be carried out in practice based research?

1. Ethical issue, RCT vs. uncertainty
   - Dentist preference
   - Patient preference

2. Often complex, and thus never identical, treatment managements
1. Ethical issue, RCT vs uncertainty
   - Dentist preference
   - Patient preference
2. Often complex, and thus never identical, treatment managements
3. Operator calibration vs. GLM-statistics

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• Complexities in advanced prosthodontic care and research priorities
• Practice based research for making better treatment decisions
• Why patient care have the potential to improve when research is conducted trans-disciplinary

Clinical practitioners
• Pragmatists: what works - what creates problems?
• Great diversity of experience, interest and capacity
• Reporting draw on a panoply of experience
• GPs/specialists; single/teams; secondary/tertiary care
Scientists
- General sciences
- Biological sciences
- Oral sciences
- Clinical
- Laboratory

- Creates "scientific evidence"
- Formulation of ideas, hypotheses, study design, data collection
- Peer review, internal/external validity, debates within paradigms
- Findings are reported in probabilities, not absolutes

Critical appraisers
- Epidemiologists
- Statisticians
- Social scientists
- Health economists
- Clinicians

- Appraise the evidence for clinical care and practice
- Collect, abstract and evaluate publications
- Debates about values and balance between consensus and evidence, rigour of data and application of statistics

Guideline developers

- Creates guidelines, protocols and standards
- Local consensus, sometimes national guidelines; Delphi strategies versus AGREE approach
- Often clinical specialists seeking ways to influence peers
Oral health care can improve when these multi-disciplinary activities are integrated
... and we stop living in separate worlds...

Advancements require communication
Different educational backgrounds, evaluation of best practice
Different pressures, priorities, terminologies, preoccupations
BARRIERS: Ignorance-Defensiveness-Arrogance

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Thank you for kind attention