

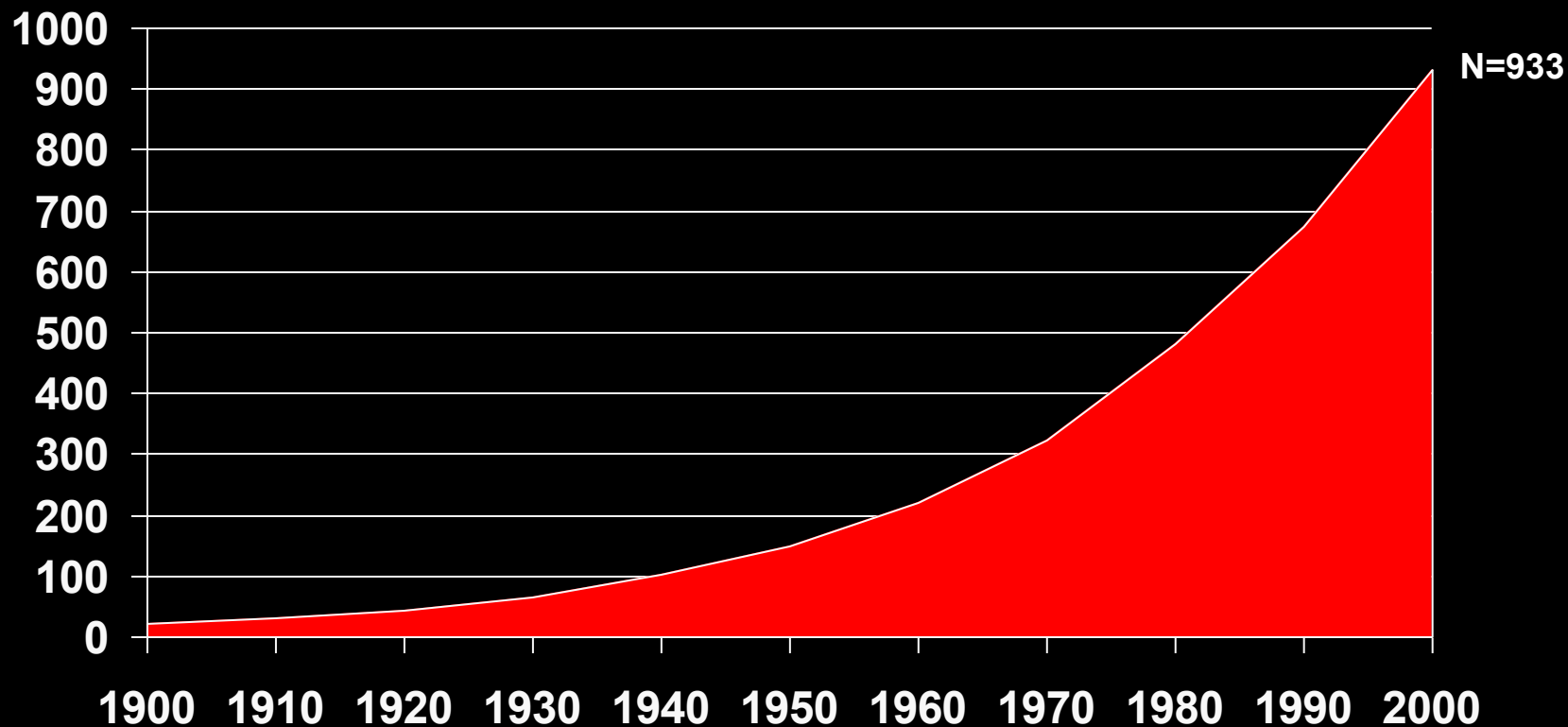
# Teaching oral sciences in the rapidly changing society in an age of information

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University of Oslo

# A rapidly changing society

- The production of new knowledge is at maximum in historical context
- Rapid changes of new ideas and concepts
- Information technology has improved the potential for information transfer to everybody
- Affects us all
  - Students and teachers
  - Patients
  - Researchers

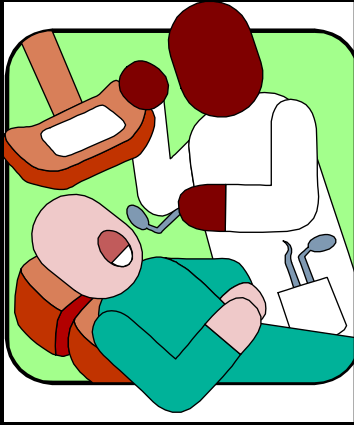
# Dental journals in circulation



Source: Ulrich's International Periodicals Directory

Where and by who is  
new knowledge in oral  
sciences created?

# The clinical practitioners



- Single handed GPs/ specialists in teams; secondary/tertiary care
- Great diversity of experience, interest and capacity
- Draw on a panoply of experience
- Pragmatism: what works - what creates problems

# The researchers



- Creates “scientific evidence”
- Formulation of ideas, hypotheses, study design, data collection
- Peer review, internal/external validity, debates within paradigms
- Report findings in probabilities, not absolutes

# The appraisers of evidence for clinical practice



- Epidemiologists, health economists, statisticians, social scientists, and clinicians
- Collect, abstract and appraise practice related knowledge
- Debates about value and balance between consensus and evidence, rigour of data and application of statistics

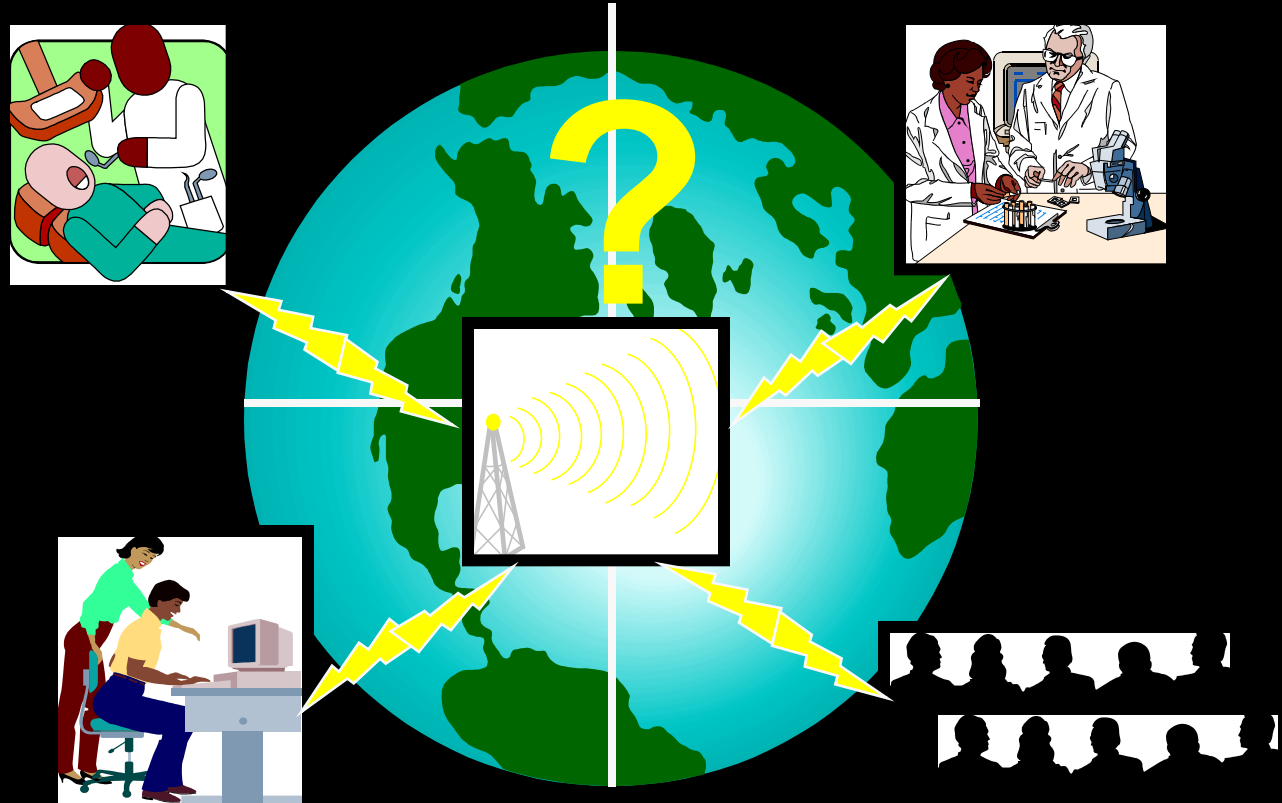
# Developers of local guidelines and protocols



- Local consensus, sometimes on national guidelines
- Clinical specialists seeking ways to influence peers



# Advancement depends on good communication



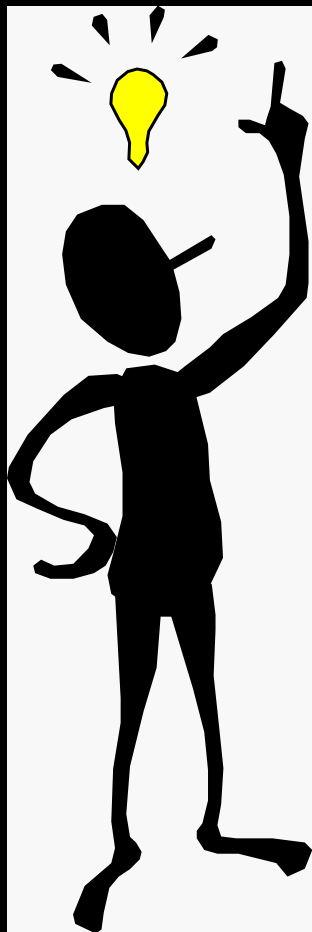
**BARRIERS:** Ignorance-Defensiveness-Arrogance

Different educational backgrounds, evaluation of best practice

Pressures, priorities, language, preoccupations

How will tomorrow's  
students and  
teachers be  
affected?

The graduate  
yesterday

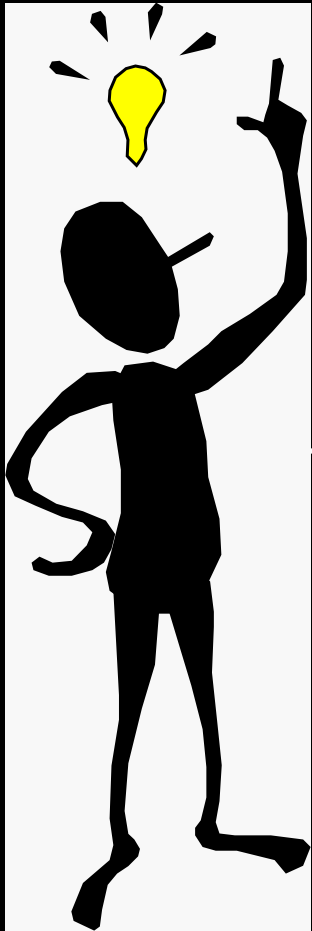


Teachers  
"Curriculum"

Knowledge  
-base for  
oral care



# The graduate today



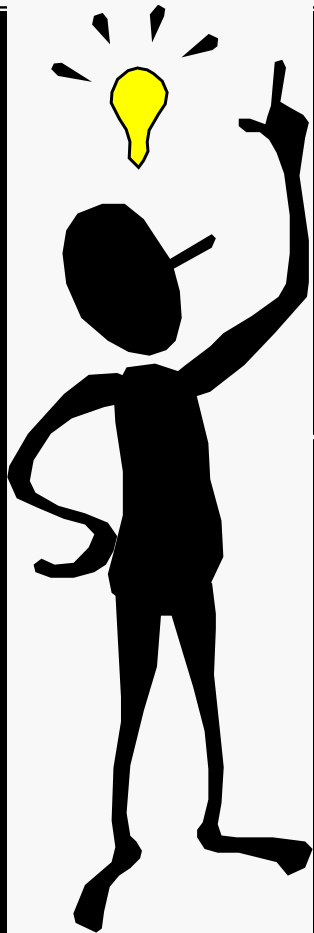
Advertising  
- producers  
- colleagues

Teachers  
"Curriculum"

Knowledge  
-base for  
oral care



# The graduate tomorrow

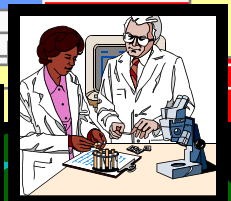
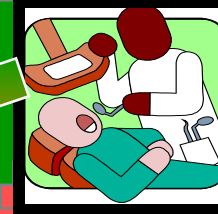


Advertising  
- producers  
- colleagues

Teachers  
"Curriculum"



# Knowledge -base for oral care



# The graduate today and tomorrow

- Has been taught and can perform many basic clinical procedures - not necessarily the most modern
- No hands-on experience with many procedures common in modern dental clinics
  - from where and how can further training be obtained?
- Theoretic knowledge at zenith, from now on less time for reading / question of priorities
- Already from day 1 the oral sciences advances further - how to stay updated?

# Solution: Educational strategy

Premise: Difficult politically to expand curriculum and length of study

- Problem based learning PBL
- Focus on “why”s instead of “how to”s
- Motivate on need for life-long learning
- Teach critical appraisal of new information
- Prepare how to meet tomorrow’s knowledgeable patients’ needs and requests

How will tomorrow's  
clinical practitioners  
be affected?



# Dentists' environment: An information overload

Advertising  
- producers  
- colleagues

Meetings/  
courses

Colleagues

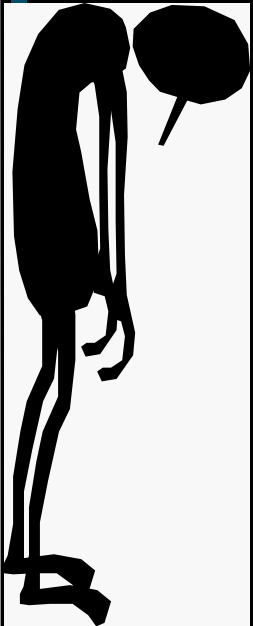
WWW

Patients & (-groups)

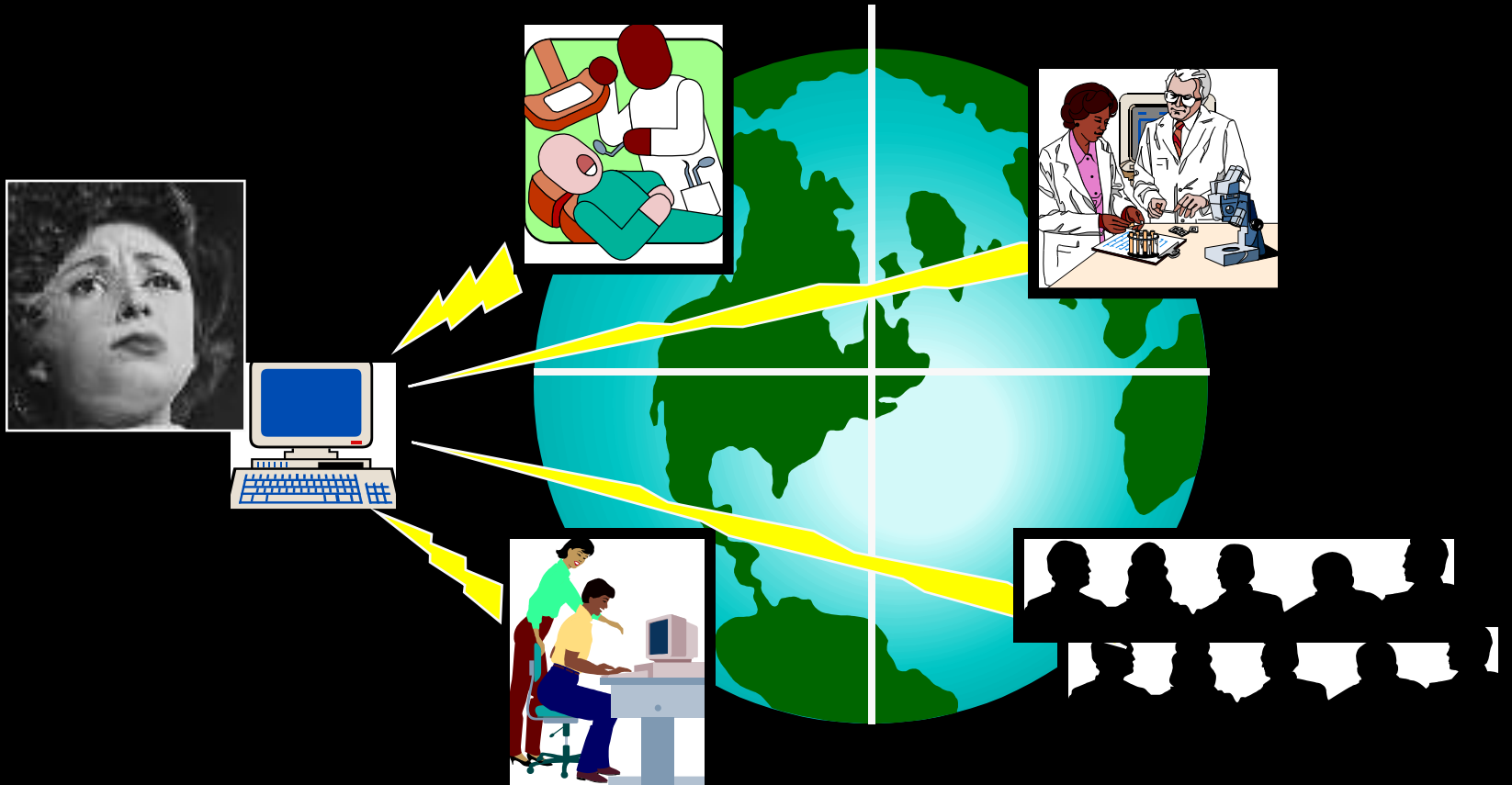
Popular magazines & Media

Dental  
literature

**Dental  
„science“**  
700 journals:  
25 000 articles/y



# More knowledgeable patients:



- ✓ **Patient communication!**
- ✓ Wish to remain sound, look healthy.... young
- ✓ Competitive health providers

We need to consider not  
only the  
amount  
of information, but also  
the  
quality  
of this information

# Solution: Integrate evidence-based clinical practice

- A practical aspect
  - A strategy for solving clinical problems on a daily basis.
- An ethical aspect
  - A strategy for being reasonably certain that my advises and treatment are the best available to my patients.

# Where to find evidence based dentistry resources?



# **fdi** National and International Guidelines & Statements, Position papers, Proceedings, Systematic reviews, Meta-analyses



- [Patient issues](#)
- [Public health issues](#)
- [Precautions in the dental office](#)
- [Materials, techniques & procedures](#)
- [Specialised procedures](#)
- [Education & Scientific issues](#)
- [Dentists' world](#)

## **Patient issues**








Endocarditis	<a href="#">[World]</a>	<a href="#">[FDI]</a>	
Dental erosion	<a href="#">[World]</a>	<a href="#">[FDI]</a>	<a href="#">[FDI statement]</a>
Disabled patients	<a href="#">[World]</a>	<a href="#">[FDI]</a>	
Emergency treatment	<a href="#">[World]</a>	<a href="#">[FDI]</a>	
Odontophobia, psychology, fear	<a href="#">[World]</a>	<a href="#">[FDI]</a>	
Oral mucosal problems	<a href="#">[World]</a>	<a href="#">[FDI]</a>	
Saliva and oral health	<a href="#">[World]</a>	<a href="#">[FDI]</a>	
Temporomandibular dysfunction	<a href="#">[World]</a>	<a href="#">[FDI]</a>	

## **Public health issues** [\[Top\]](#)

## fluorides

Year	Original title	Type	Country	Source	Publish	Authors	http	ISDN	topi
2001	Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States	Review/guidelines	USA	CDC, Centers for Disease Control and Prevention	MMWR 50:(RR-14): 1-42		<a href="#">Center for Disease Control</a>		fluorides
2001	Core messages in oral health education	ongoing project	International	FDI Commission project 97-06	Int Dent J 2000; 50; 3: 115-74	Clarkson J, Loe H, Sreebny LM, König K	<a href="#">Project details</a>		fluoride prophylaxis diet caries
2001	Development and implementation of programs and policies for the prevention of oral diseases	Resource	USA	Association of State and Territorial Dental Directors (ASTDD)			<a href="#">Contact: ASTDD</a>		prophylaxis fluoride car sealant evi
2001	Fluoride - Seen from Different Perspectives. Workshop held on various topics related to fluoride in the light of changing conditions Nov 2000, Amsterdam	Proceedings	International		Caries Res 2001;35:supplement 1		<a href="#">Caries Res</a>		fluoride
2001	Fluoride in restorative materials	ongoing project	International	FDI Commission project 97-08	Project in progress	Clarkson J, McConnell R, Burke F	<a href="#">Project details</a>		restorative fluoride
2001	Topical fluoride for preventing dental caries in children and adolescents	Systematic Review	International	Cochrane Collaboration Library		Marrinho VCC, Sheiham A, Logan S, Higgins JPT	<a href="#">Cochrane Collaboration [Password required]</a>		fluoride prophylaxis
2001	Water Fluoridation	Resource	USA	National Center for Fluoridation Policy & Research			<a href="#">NCFPR</a>		fluoride
2001	Optimal intake of fluoride	ongoing project	International	FDI Commission project 96-08	Project in progress	Clarkson J	<a href="#">Project details</a>		fluoride
2000	Fluoride and Dental Caries	Statement	International	FDI General Assembly 2000	FDI World 2001; 10(3):		<a href="#">FDI statement</a>		fluoride
2000	CDA Statement on Fluoridation	Statement	Canada	CDA, Canadian Dental Association			<a href="#">CDA-ADC</a>		fluoride
2000	Oral Health in America: A Report of the Surgeon General	Review	USA	NIH, National Institutes of Health	NIH Publication No 00-4713	Satcher D	<a href="#">Surgeon General</a>		epidemiol fluoride car tobacco ca perio-pub
2000	International Collaborative Research on Fluoride	Proceedings	USA	NIH, National Institutes of Health	J Dent Res 2000; 79(4): 893-904	Clarkson JJ, Hardwick K, Barnes D	<a href="#">J Dent Res</a>		fluoride
2000	Fluoridation of Drinking Water: a Systematic Review of its Efficacy and Safety	Systematic Review/Guidelines	United Kingdom	NHS Centre for Reviews and Dissemination	CRD Report 18		<a href="#">NHS R&amp;D</a>		fluoride
1999	Utilisation du fluor chez les enfants: recommandations de l'European Academy for Paediatric Dentistry (EAPD). [Use of fluorides in children: recommendations of the European Academy for Pediatric Dentistry]	Guidelines	Belgium/Belgique	European Academy for Pediatric Dentistry	Rev Belge Med Dent 1999; 53: 318-24	Marks LA, Martens LC	<a href="#">UI: 99361395</a>		fluoride
1999	Fluoridation of water supplies	Statement	International	IADR, International Association for Dental Research			<a href="#">IADR</a>		fluoride
1999	Fluoride supplements and fluorosis: a meta-analysis	Meta-analysis	USA	University of Michigan	Community Dent Oral Epidemiol 1999; 27: 48-56	Ismail AI, Bandekar RR	<a href="#">UI: 99184730</a>		fluoride
1999	Fluoridation	Review/Guidelines	Canada	Calgary Regional Health Authority			<a href="#">CRHA</a>		fluoride
1999	Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries	Review	USA	CDC, Centers for Disease Control and Prevention	MMWR 48(41): 933-940		<a href="#">Center for Disease Control</a>		fluorides



<b>Specialist Journals</b>	<b>Nature</b>	<b>Nature Publishing Group</b>	<b>Macmillan</b>	<b>Macmillan Reference</b>
 nature publishing group	 nature publishing group			
<a href="#">HOME</a>	<a href="#">INFORMATION</a>	<a href="#">SUBSCRIBE</a>	<a href="#">REGISTER</a>	<a href="#">SEARCH</a> <a href="#">HELP</a>
<p><b>Journal home</b></p> <p> <b>For readers</b></p> <ul style="list-style-type: none"> <li>• Content</li> <li>• E-alert</li> <li>• Search content</li> <li>• Related journals</li> </ul> <p> <b>For authors</b></p> <ul style="list-style-type: none"> <li>• Editor</li> <li>• Call for contributors</li> <li>• Aims and criteria</li> </ul> <p> <b>Customer services</b></p> <ul style="list-style-type: none"> <li>• Subscribe</li> <li>• Prices</li> <li>• Order sample copy</li> <li>• Order reprints</li> <li>• Request permissions</li> <li>• Contact us</li> </ul>	<h2>Evidence-Based Dentistry</h2> <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  <p><b>ISSN 1462-0049</b> <b>2001 Volume 3 Published quarterly</b></p> </div> <div style="flex: 2;"> <p><b>View tables of contents</b></p> <p>A central resource for the most cutting-edge and relevant issues concerning the evidence-based approach in dentistry today. <i>A British Dental Journal</i> and Nature Publishing Group publication.</p> <p><b>Audience</b></p> <p><i>Evidence-Based Dentistry</i> is aimed at general dental practitioners to help them keep abreast of the best available evidence on the latest developments in various aspects of clinical dentistry. In addition, it is an invaluable tool for the specialist practitioners needing to maintain an awareness of new approaches outside their branch of dentistry.</p> </div> </div>			
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How will  
tomorrow's clinical  
researchers be  
affected?

Sulzer Calcitek Inc.

# A Longer Lasting Membrane

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Maintains an Effective Barrier Longer!

week

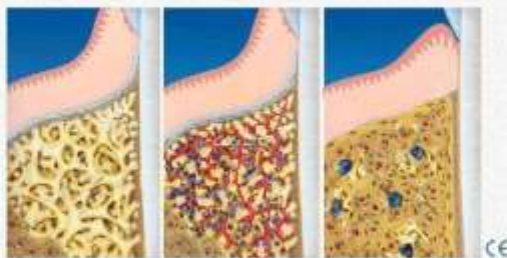
1

week

18

Fully Absorbed in 18 Weeks

### System for Periodontal Tissue Regeneration



The well-established system for natural bone regeneration, Bio-Oss® and Bio-Gide®, has been expanded to include a system for periodontal tissue regeneration: the PERIO-System, which uses Bio-Oss® COLLAGEN and Bio-Gide® PERIO. Many years of clinical experience and international scientific study trials provide proof of its compatibility for use in periodontal indications.

The new Bio-Gide® PERIO is a cell-occlusive, resorbable bilayer membrane which forms an effective barrier for shielding and protecting the periodontal



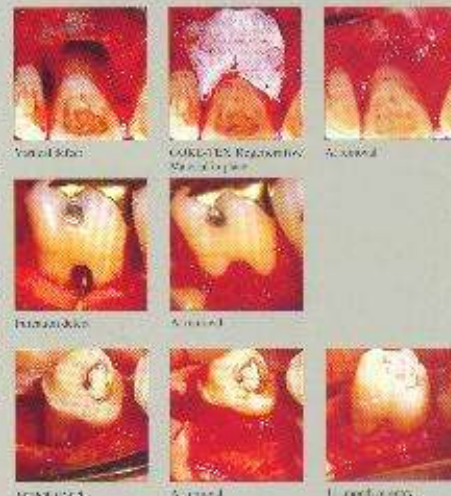
GORE-TEX™ REGENERATIVE MATERIAL

TRANSGINGIVAL CONFIGURATIONS



Geistlich Biomaterials

ions are for applications involving a structure that extends through the oral environment. Transgingival is an open microstructure "collar" designed to promote growth of connective tissue and inhibit the epithelium through a phenomenon known as "A partially occlusive pectin protects the competing tissues and maintains a space in 1 can occur.



Bio-Gide® PERIO



# GTR Attachment gain -traditional reviews

- Compared to open flap debridement = 2.7mm

Laurell L, Gottlow J, Zybutz M, Persson R. Treatment of intrabony defects by different surgical procedures. A literature review. J Periodontology 1998;69:303-313

Incorporation of uncontrolled and unblinded studies

- Compared to open flap debridement = 1.6mm

Cortellini P, Tonetti M. Focus on intrabony defects: guided tissue regeneration. Periodontology 2000 2000;22:104-132.

Unclear selection criteria for studies

Inclusion of studies of short duration

# GTR Attachment gain - systematic reviews

- A small benefit is apparent
- Results of clinical trials are not consistent
- Technically demanding treatment
- Local biological factors uncertain
  - e.g. “critical size”, endotoxin remnants, etc.

Jokstad. Norwegian Periodontal Society. Oslo, Nov 1999.

Needleman et al. Cochrane Library 2001;3.

- Compared to open flap debridement = 1.1mm  
(Needleman et al. Cochrane Library 2001;3)

# Solution: Attention to methodological rigorousness of primary and secondary research

- CONSORT statement
- Good Clinical Practice for trials-75/318/EEC
- ISO TC194 Biological evaluation of medical devices
- CEN TC055 Clinical investigation standards
- Cochrane collaboration guidelines

# Example 1: Diagnostics

Rapid developments of  
emerging technologies

–e.g. caries diagnosis

# Caries diagnosis

## Traditional techniques

Visual

Tactile

Radiological

## Recently developed technologies

Digital radiography - expert systems

Laser fluorescence

Electrical conductivity (EC)

Fibre optic (FOTI)

## Emerging technologies

Quantitative laser-light induced fluorescence

Ultrasonography

Alternating current impedance spectroscopy

# Example 1: Diagnostics

- Rapid developments of emerging technologies
  - e.g. caries diagnosis
- Danger of blinding by technology
- Validation in appropriate settings and populations?



## Example 2: Therapy

- Only small improvements can be anticipated
- Adequate study design, sample sizes and settings
- Need for RCTs, power calculations, international cooperation and multi-centre studies

# A rapidly changing society

The dentist have always had to cope with patient anxiety...pain...hope...priorities...motivation...gratefulness...anger...worry...despair...pathology...education...esteem...uncertainty...vanity...distress...restoration...submission...inflammation...aggression...values...resentment...appreciation...fear

- Today: Add: informed patients
- Adapt or resign
- Survival of the ~~fittest~~ informed



Thank you  
for your  
kind  
attention