# Kunnskapsbasert behandlingsplanlegging og klinisk praksis

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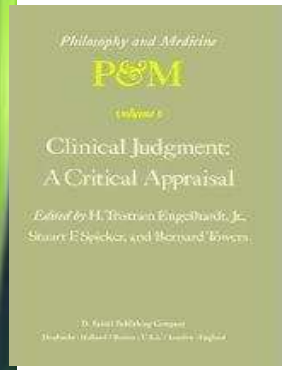
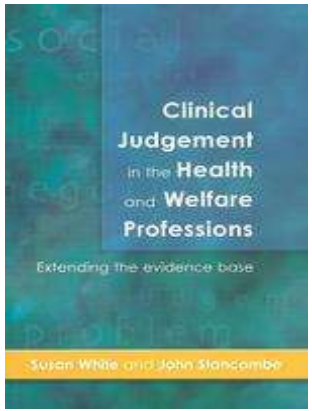
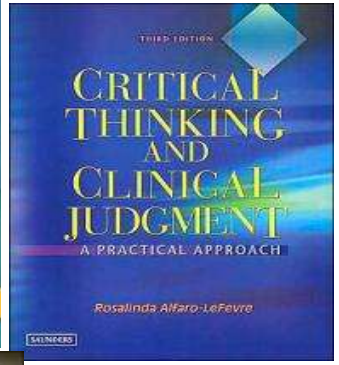
# Kliniske scenarier- valg, løsning & evidens

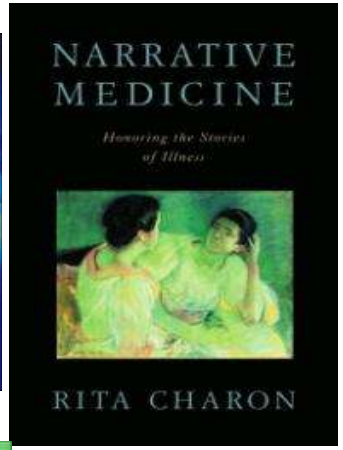
1. En utslått fortann på en ung pasient – ditt valg av terapi har en livslang konsekvens
2. Tanna med usikker rotfylling - endorevisjon før krone eller ekstraksjon?
3. Må en eksponert tannrot som er rotfylt revideres før kroneterapi?
4. Hvor mye periodontalt festetap er for mye festetap for en bro?
5. Den nye broen – bør ikke helkeram nå kunne erstatte metall-keramet?
6. Singeltannsluka i fronten – er en implantatløsning alltid best?
7. Metall-keram-broen til svigermor – er valget av lav-edel-legeringen lumpent?
8. Slitasjetannsettet – er plast billig og bra ? …eller bare billig?
9. TMD pasienten – hvordan var det med stabilisering- eller reposisjonerings-skinnene?
10. Den perioaktive røykeren som mistet 17&16 – og bare måtte ha implantater! (?)
11. Kollumfraktur – hvilken faktorer er viktigst for kroneretensjon og –prognose?
12. Sinkfosfatsement er 100 år gammelt men plastsement er nytt –valget er vel klart?
13. Fiberforsterkede stifter har nå erstattet støpte stifter – n'est-ce pas?
14. Er kostnadene for enkelt-implantat og for en liten bro likeverdige sett over tid?

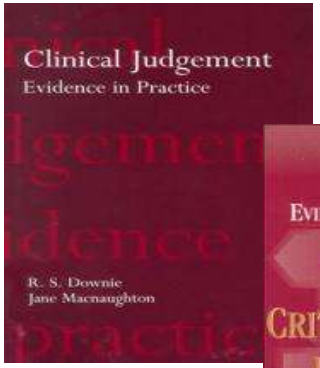
# Reflekterende klinisk utøver = å være (selv-)kritisk!

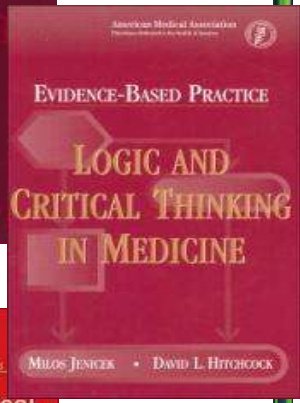


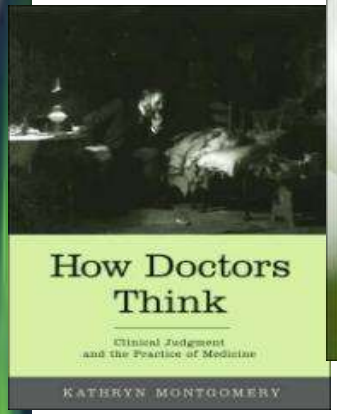



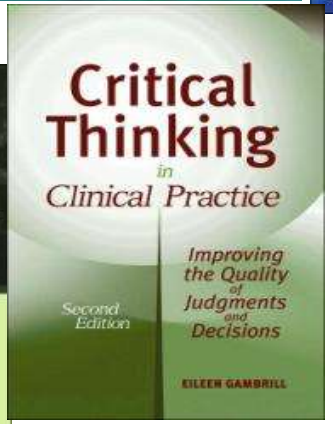



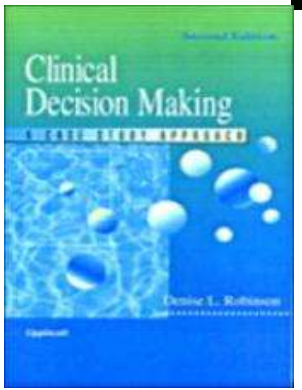



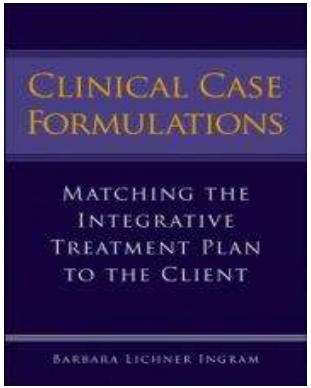



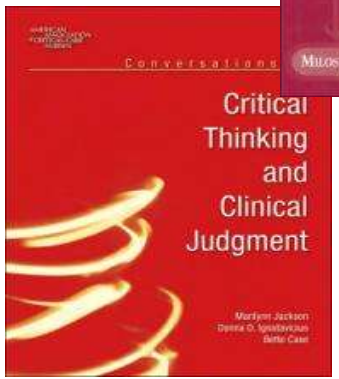



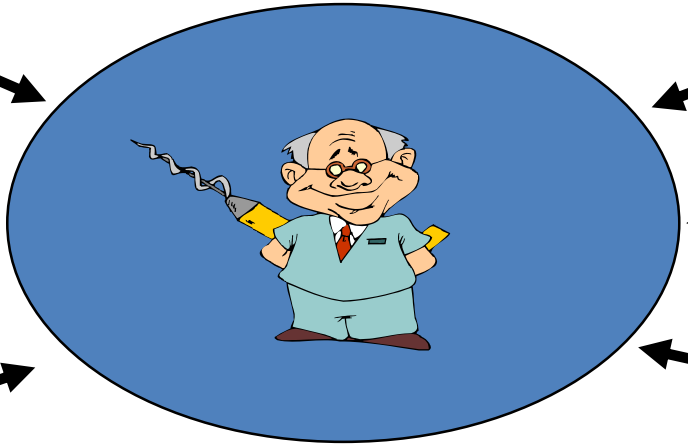



# Hva påvirker vår preferanse for valg av terapi?



Tilgjengelige Ressurser

Tilsyn

Betalingsystem

Utdanning

Erfaring

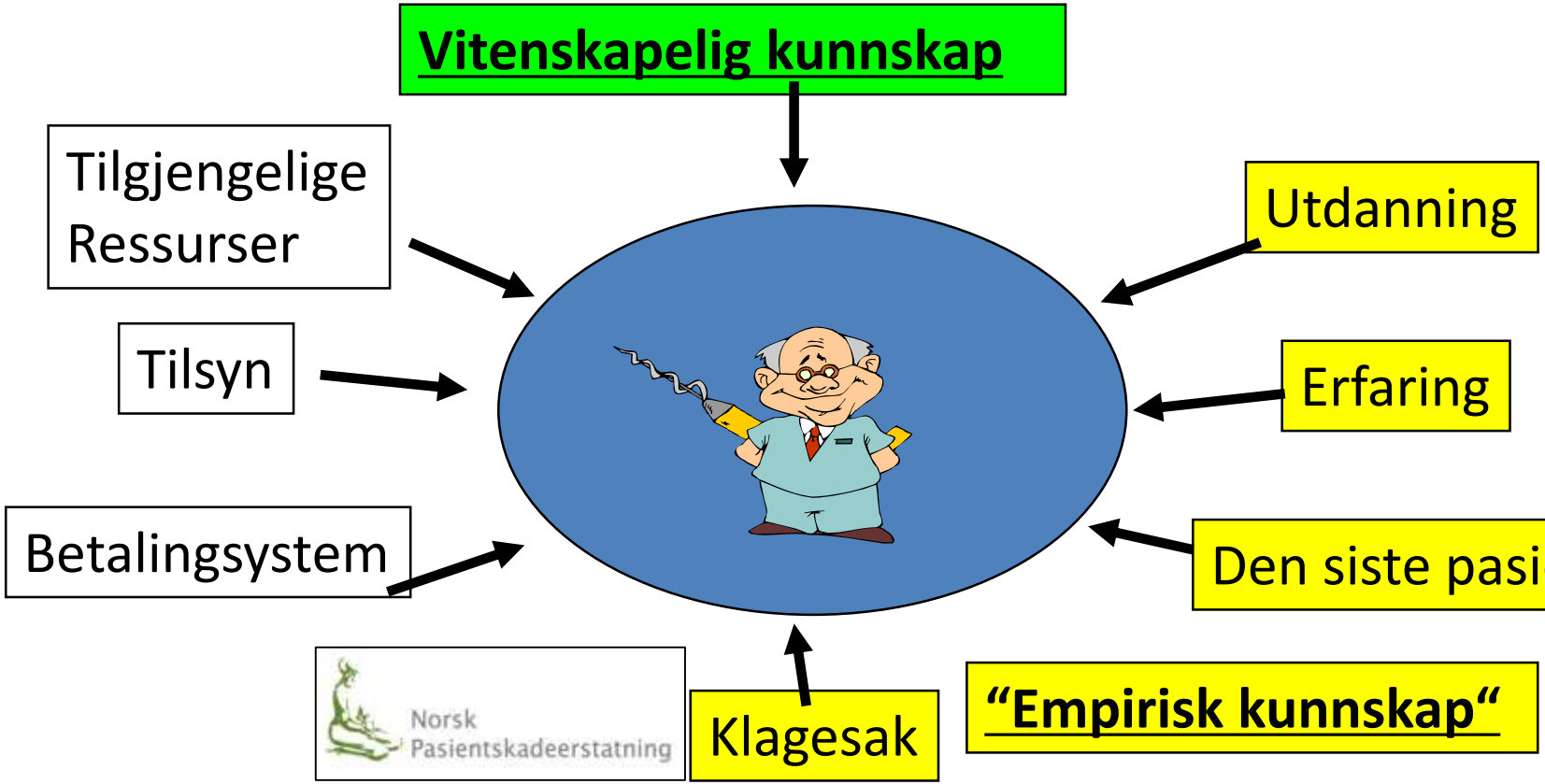
Den siste pasienten

Klagesak

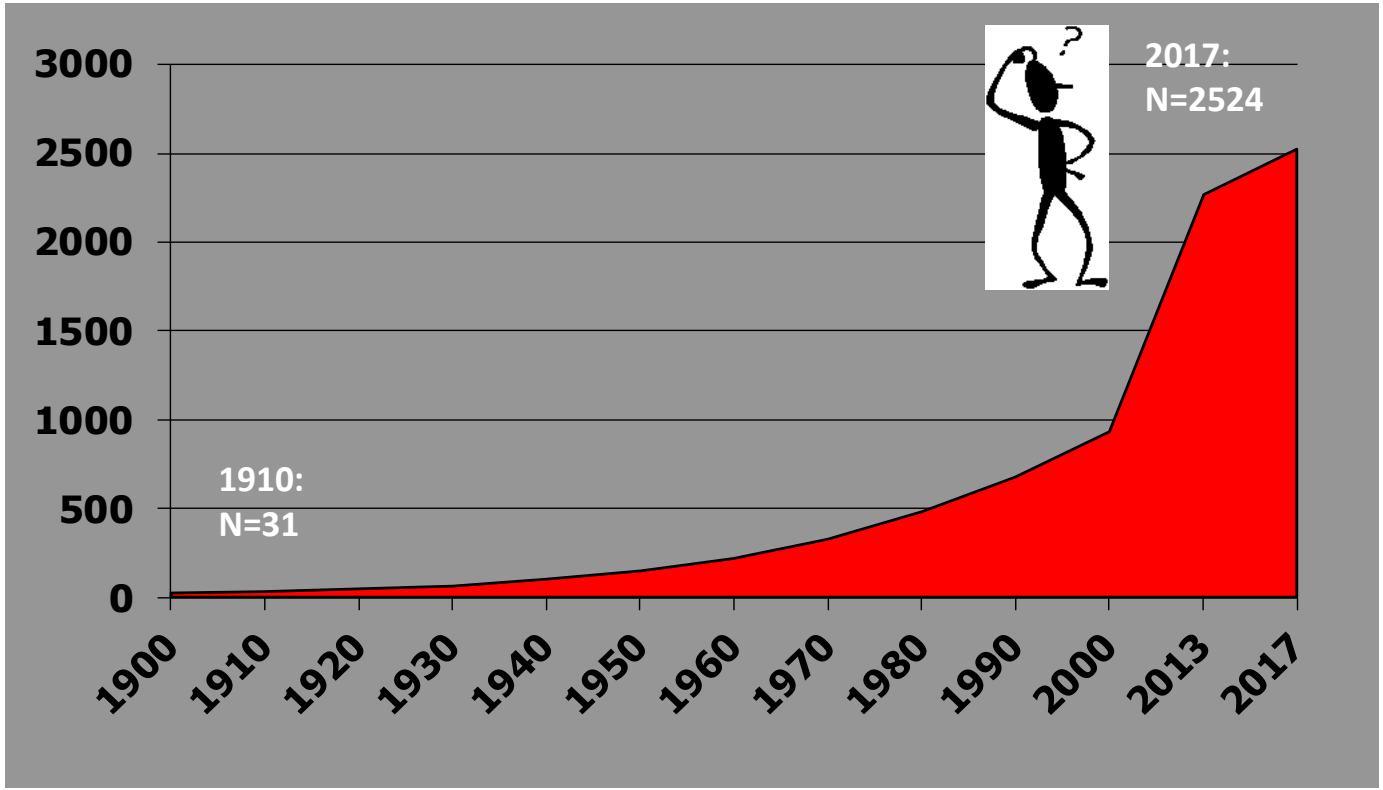
**“Empirisk kunnskap“**

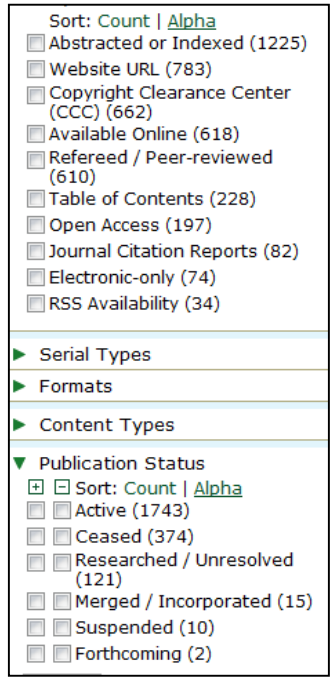
Norsk Pasientskadeerstatning

# Hva påvirker vår preferanse for valg av terapi?



# Publikasjoner myntet mot tannlegeteamet




Source: Ulrich's International Periodicals Directory

# Informasjonseksplosjon – bakenforliggende årsak

Kraftig vekst av publikasjoner i medisin - inkludert innen odontologi

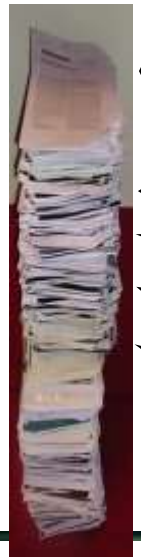
1. Antallet helsepersonnel og forskere øker globalt

2. Antallet (vitenskapelige) artikler er nøkkel til stilling, penger og ære

3. Publisering i dag  er langt rimeligere enn tidligere

4. Antallet publikasjoner øker kontinuerlig, spesiellt digitale

# Informasjonsflommen i dag



Markedsføring
- produsent
- kollegaer

Møter/
kurs

Helsedirektoratet

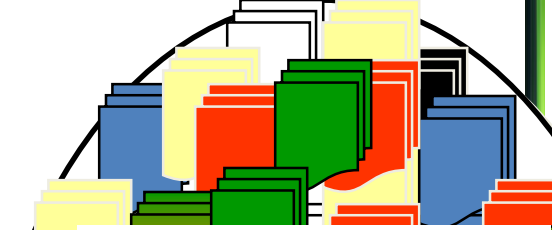
Literaturen

Kollegaer

WWW

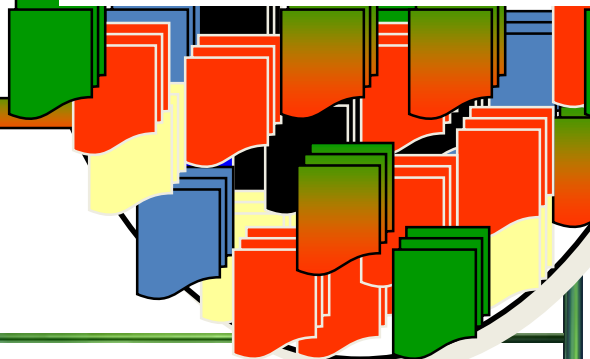
Pasienter & (-grupper)

Populærmagasin & Media



**Sannheter**
**Relative sannheter**
**Usannheter**

**‘Dental kunnskap’**
**25 000 artikler/år**



Vi må ikke bare ta stilling til

**mengden** av informasjon vi mottar

men også

**kvaliteten** på informasjonen

# Kvalitet på forskning
# Kvalitet på vitenskapelige artikler

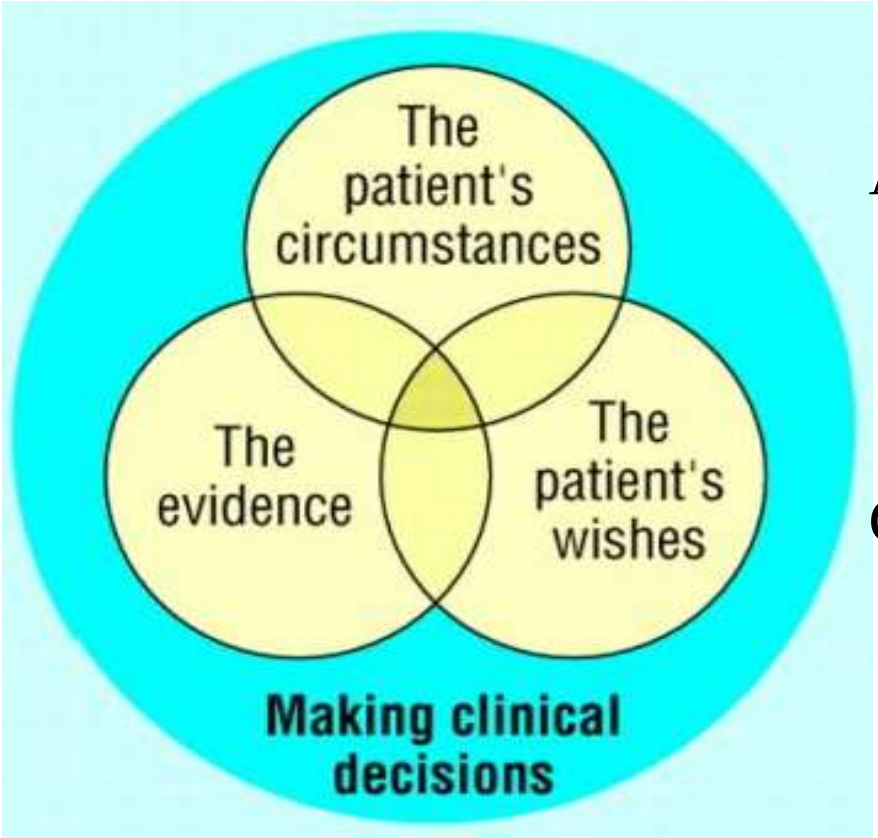


http://www.equator-network.org

# Optimale studiedesign

| | Kvalitativ | Tverrsnitt | Kasus-kontroll | Kohort | Random kontroll |
|---|---|---|---|---|---|
| Diagnostikk | | | | ☆ | ☆☆ |
| Terapi / Forebygging | | | | ☆ | ☆☆☆ |
| Prognose | | | | ☆☆☆ | |
| Screening | | | ☆ | ☆ | ☆☆ |
| Oppfatninger | ☆☆☆ | | | | |
| Prevalens/ Hypoteseutv. | ☆☆☆ | ☆☆☆ | | | |

# Evidens-
# Basert Praksis:




Fra: Haynes et al. BMJ 1998;317:273-6

# Kliniske retningslinjer blir bygget på evidens

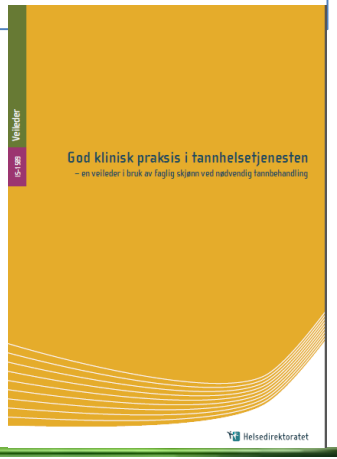
## Nye toner:


**Anbefalingenes rettslige betydning**

Helsedirektoratet skal utvikle, formidle og vedlikeholde nasjonale faglige retningslinjer som understøtter de mål som er satt for helse- og omsorgstjenesten. Retningslinjer skal baseres på kunnskap om god praksis og skal bidra til kontinuerlig forbedring av virksomhet og tjenester (Helse- og omsorgstjenesteloven § 12-5).

Retningslinjer inngår som et akseptert grunnlag og setter en norm for hva som er faglig forsvarlig, det vil si hva som er tjenester av god kvalitet. Anbefalinger gitt i nasjonale faglige retningslinjer er ikke rettslig bindende, men har likevel stor rettslig betydning gjennom kravet om faglig forsvarlighet. I situasjoner der helsepersonell velger løsninger som i vesentlig grad avviker fra gitte anbefalinger skal dette dokumenteres jf. Forskrift om pasientjournal § 8, bokstav h. En bør være forberedt på å begrunne sine valg i eventuelle klagesaker eller ved tilsyn. Se også avsnittet i retningslinjen om faglig forsvarlighet (lage lenke her).





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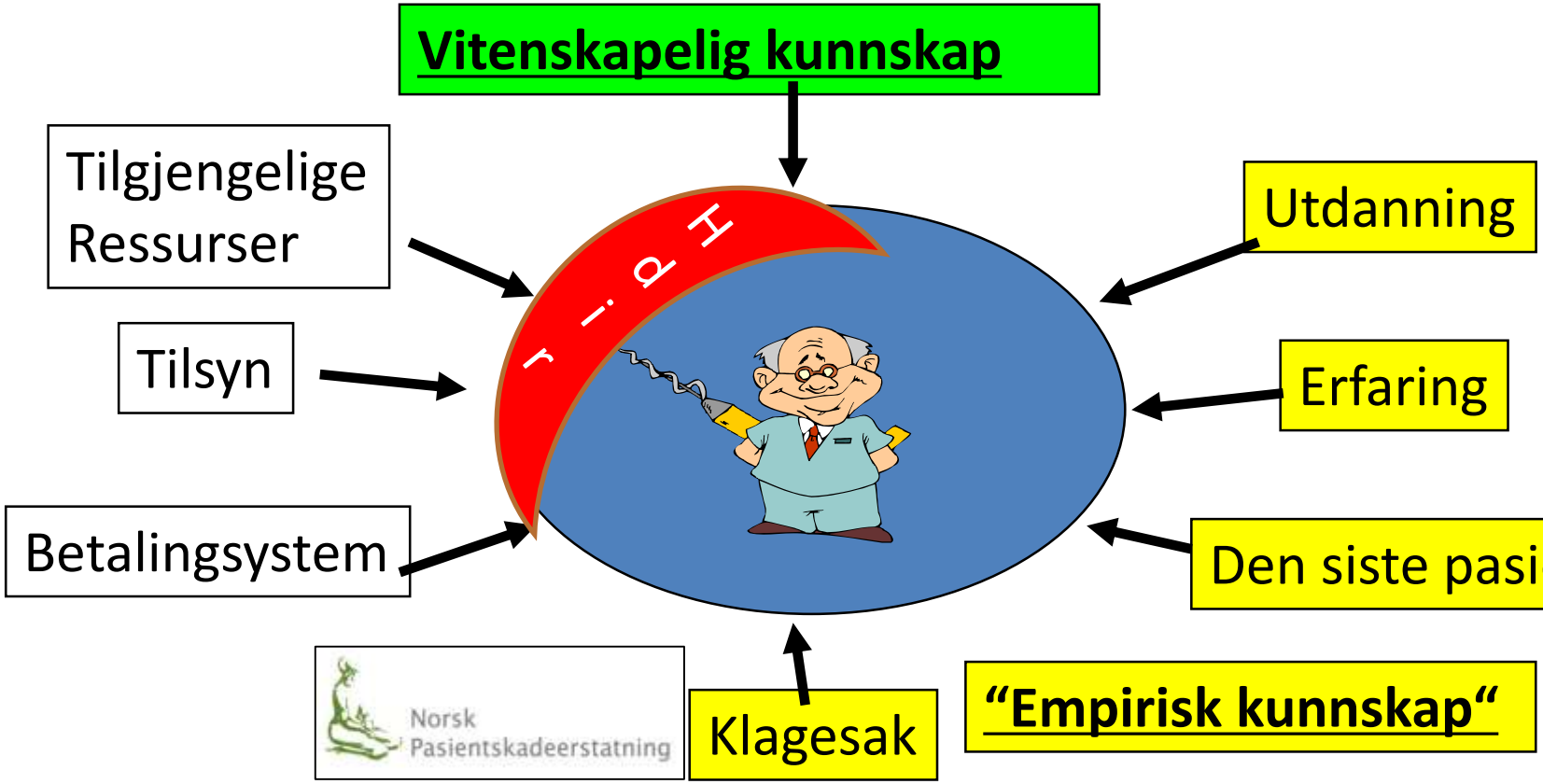
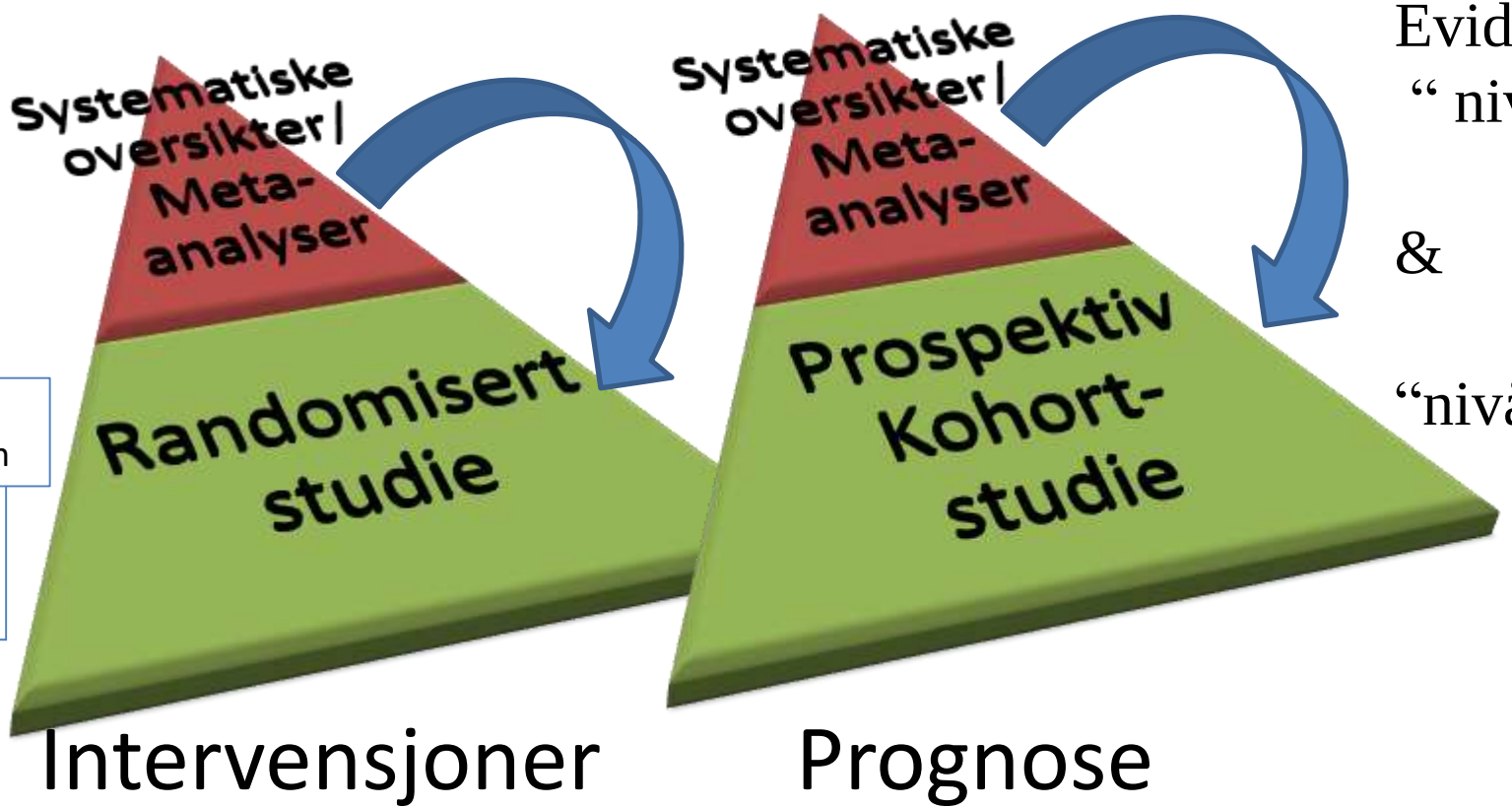


# Tiltro til medisinsk informasjon for å besvare kliniske problemstillinger



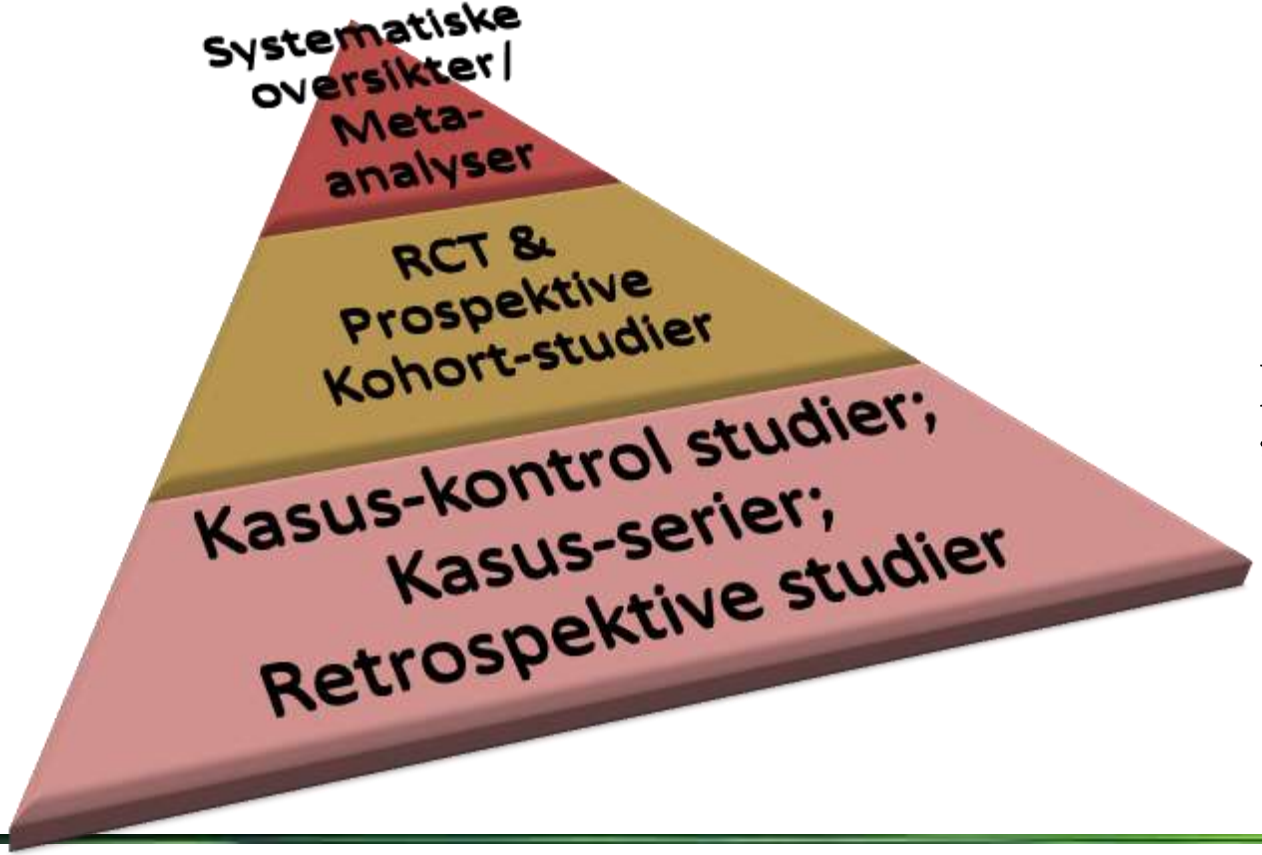

Evidens
" nivå 1"

&

"nivå 2"

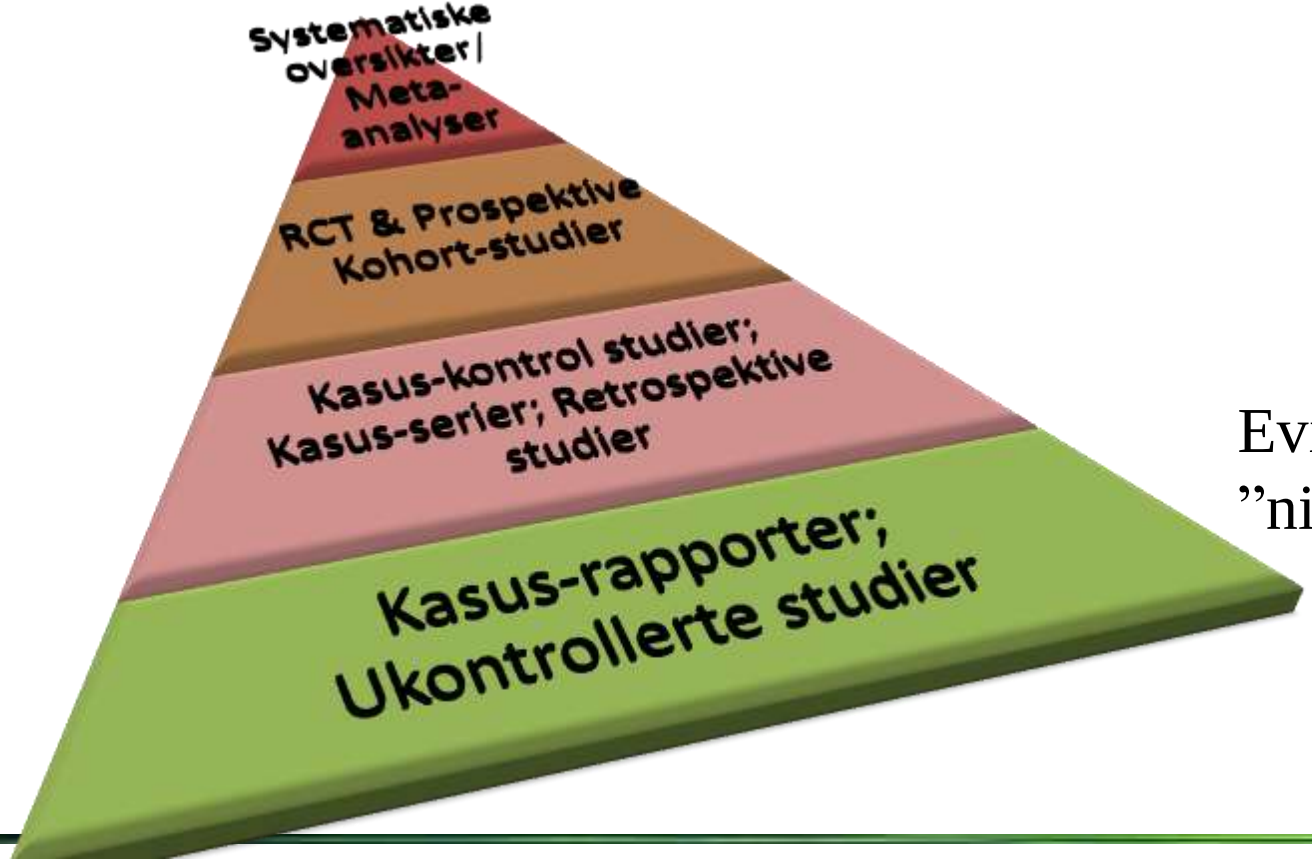
Cochrane Collaboration

# Tiltro til medisinsk informasjon for å besvare kliniske problemstillinger



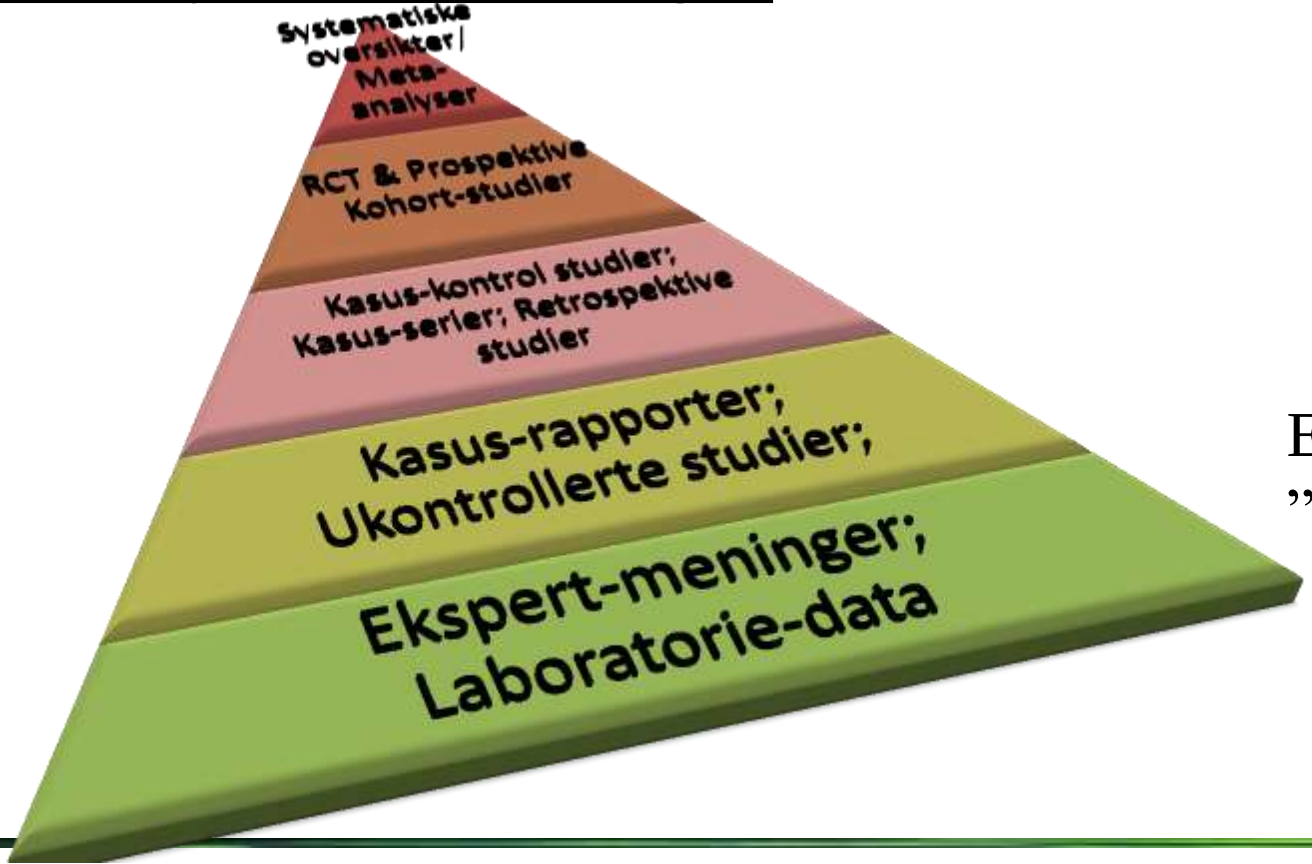

Evidens
”nivå 3”

# Tiltro til medisinsk informasjon for å besvare kliniske problemstillinger




Evidens
”nivå 4”

# Tiltro til medisinsk informasjon for å besvare kliniske problemstillinger




Evidens
”nivå 5”

# Viktige budskap om klinisk praksis

*"Medicine is*
*a science of uncertainty and*
*an art of probability"*

Sir William Osler
John Hopkins Hospital
(1849-1919)

Usikkerhet
Sannsynlighet

*"Doubt is not a pleasant condition, but certainty is an absurd one"*

Voltaire
Frankrike, (1694-1778)

Under forutsetning av at det ikke er kjevebensfraktur:

A. Sett alltid tanna tilbake på plass og vurder andre tiltak

B. Sett bare tanna på plass hvis det er mindre enn 2 timer siden skaden

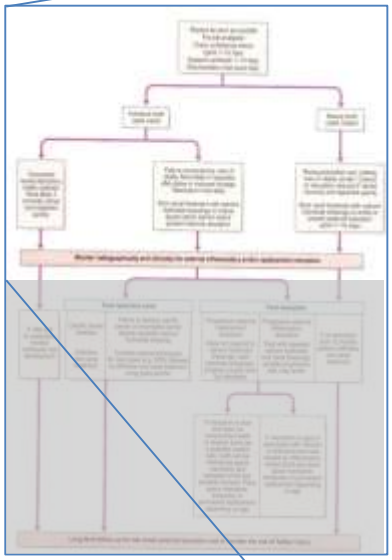
C. Sett bare tanna på plass hvis den har vært oppbevart fuktig

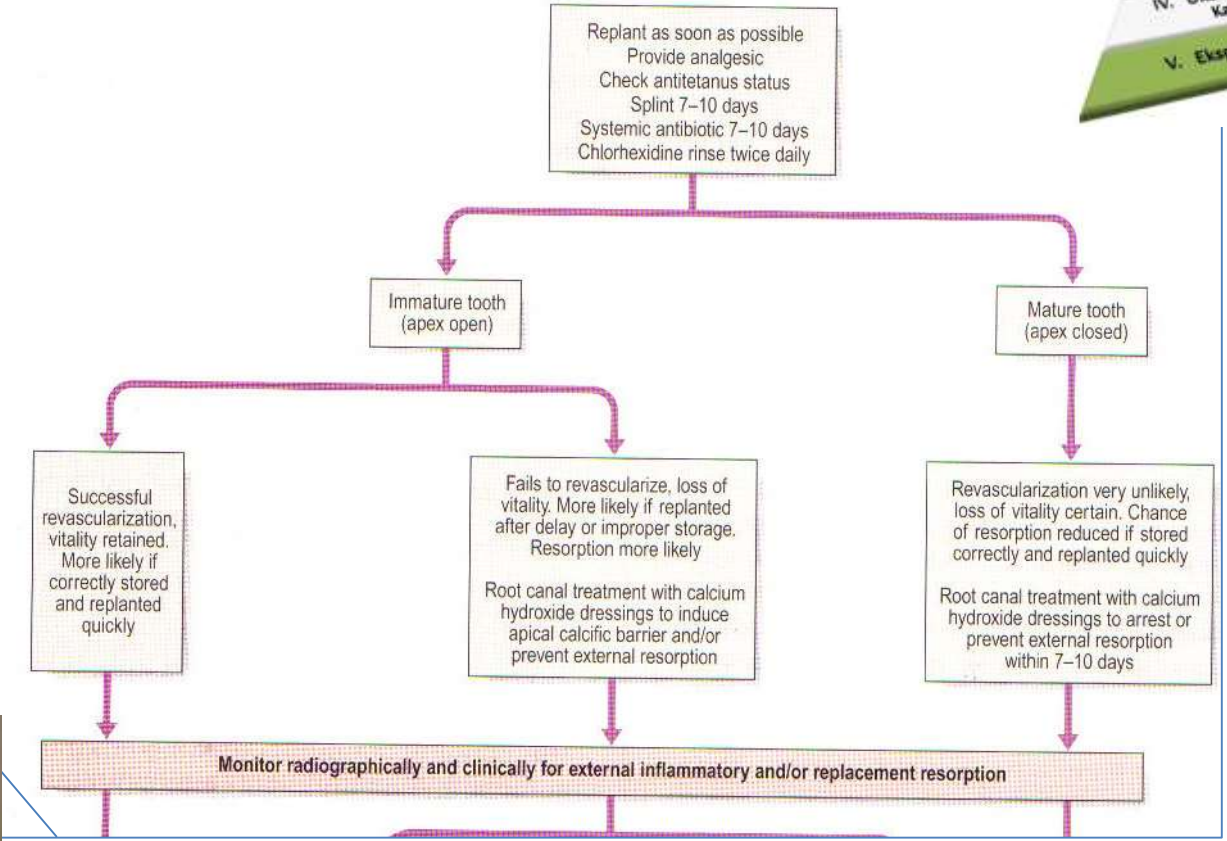
D. Sett bare tanna på plass hvis den er dekontaminert

E. Sett bare tanna på plass hvis både B, C og D

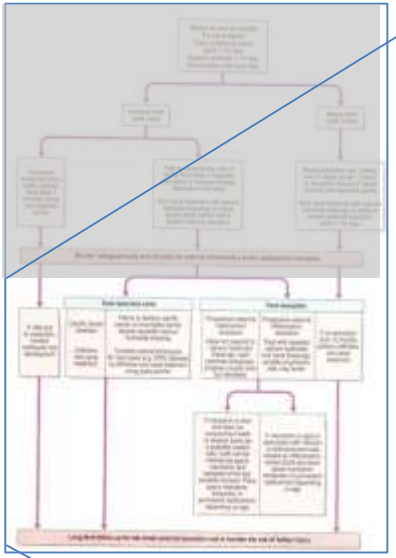
# 1. EN UTSLÅTT FORTANN PÅ EN UNG PASIENT – DITT VALG AV TERAPI HAR EN LIVSLANG KONSEKVENS

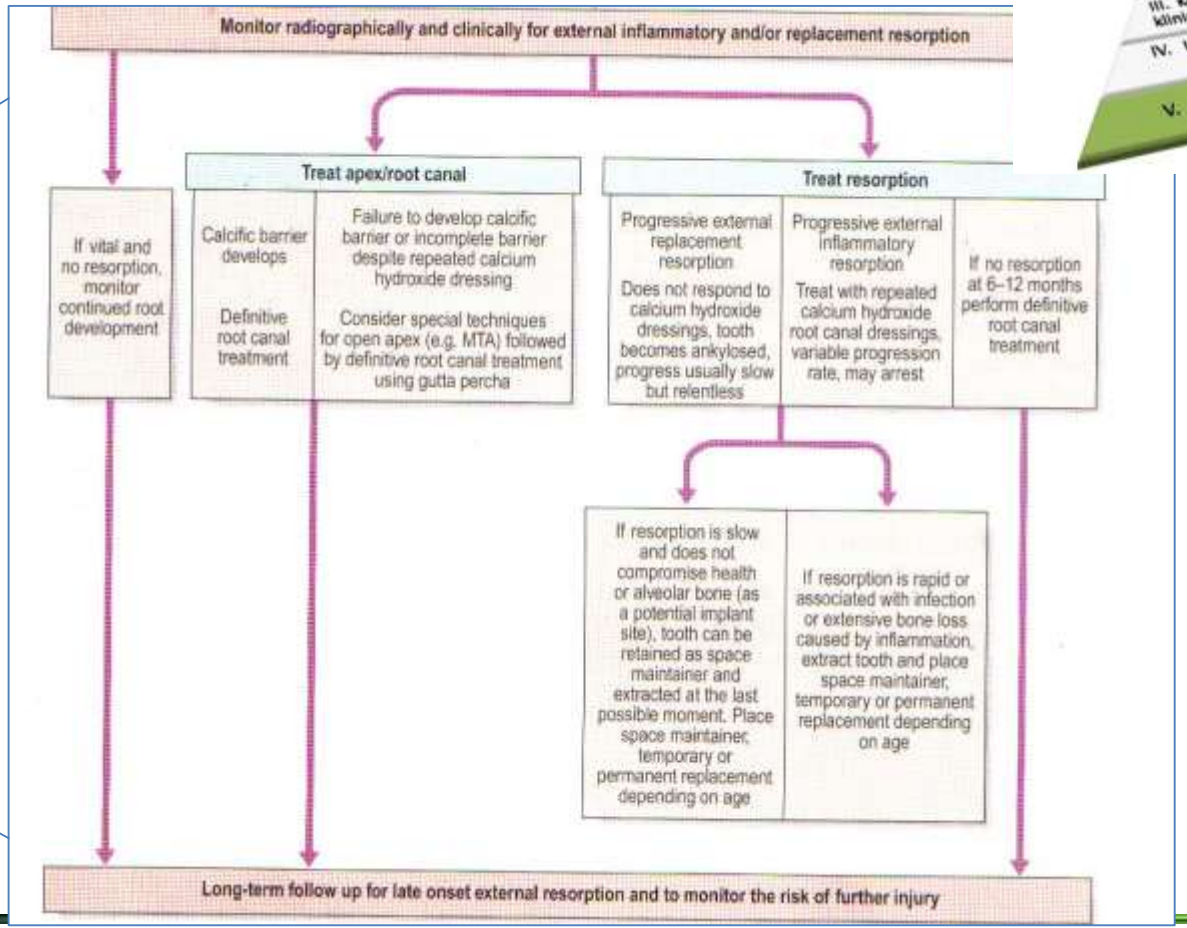
# Gamle retningslinjer 1/2



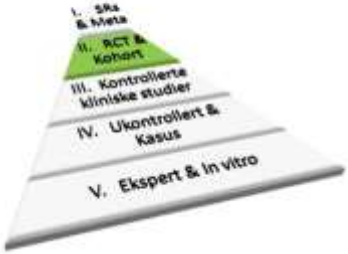




# Gamle retningslinjer 2/2




# Dekoronering av ankyloserte tenner – ble beskrevet allerede i 1984



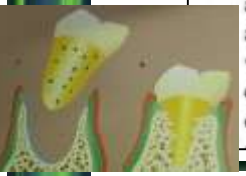

## Surgical treatment of ankylosed and infrapositioned reimplanted incisors in adolescents

BARBRO MALMGREN, MIOMIR CVEK, MARGARETA LUNDBERG AND ANDERS FRYKHOLM[1]

*Departments of Pedodontics and Oral Roentgendiagnosis[1], Eastmaninstitutet, Stockholm, Sweden*

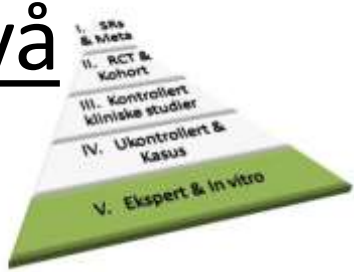
Malmgren B, Cvek M, Lundberg M, Frykholm A: Surgical treatment of ankylosed and infrapositioned reimplanted incisors in adolescents. Scand J Dent Res 1984; 92: 391–9.

Abstract – A method for preserving the alveolar ridge of ankylosed and infrapositioned incisors and improving conditions for a subsequent prosthetic therapy is described and evaluated clinically and radiographically. The method involves removal of the crown and root filling from the root, which is retained and covered with a mucoperiosteal flap. Clinically, there were no postoperative complications and after the follow-up a satisfactory prosthetic restoration was performed in all cases, regardless of the degree of infraposition before treatment. Radiographically, no pathologic



- Hvis ikke kjeveortopedi er planlagt på sikt
- Hvis fortsatt kjevevekst – når infraposisjon >¼ av normalposisjon
- Preserverer alveolarhøyden!

# Vitenskapelig kunnskap og evidensnivå



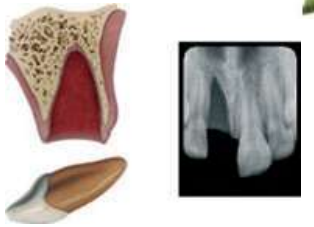

Dental Traumatology

*Dental Traumatology* 2012; **28**: 88–96; doi: 10.1111/j.1600-9657.2012.01125.x

## International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 2. Avulsion of permanent teeth

Lars Andersson*[1], Jens O. Andreasen*[2], Peter Day*[3], Geoffrey Heithersay*[4], Martin Trope*[5], Anthony J. DiAngelis[6], David J. Kenny[7], Asgeir Sigurdsson[8], Cecilia Bourguignon[9], Marie Therese Flores[10], Morris Lamar Hicks[11], Antonio R. Lenzi[12], Barbro

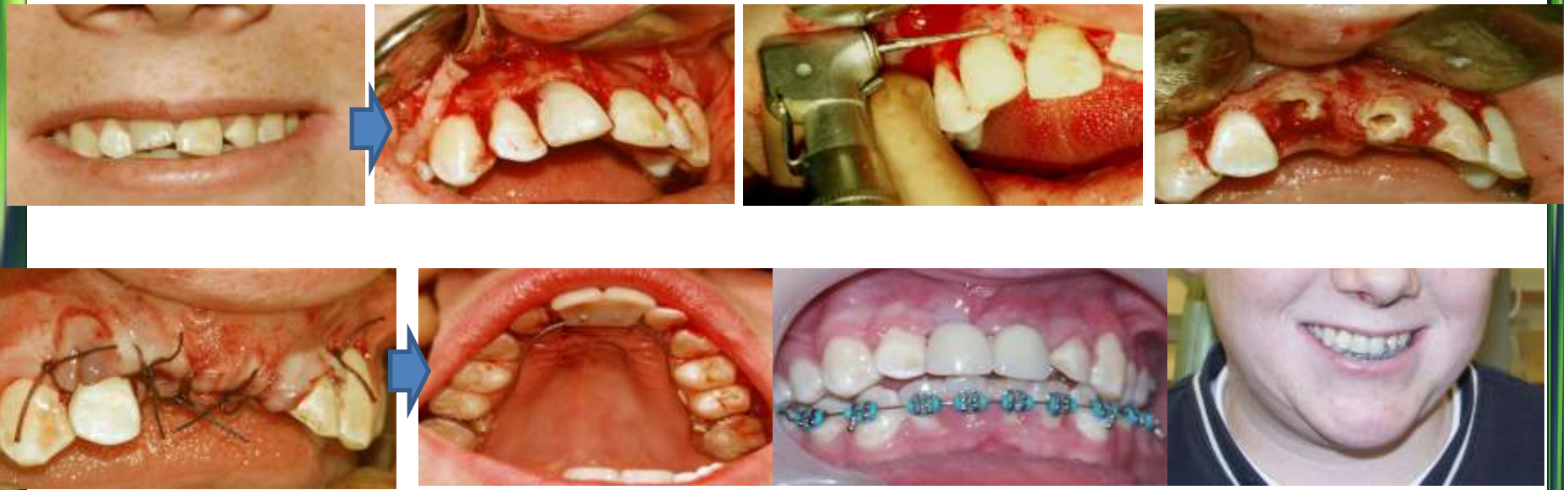
**Abstract** – Avulsion of permanent teeth is one of the most serious dental injuries, and a prompt and correct emergency management is very important for the prognosis. The International Association of Dental Traumatology (IADT) has developed a consensus statement after a review of the dental literature and group discussions. Experienced researchers and clinicians from various specialties were included in the task group. The guidelines represent the current best evidence and practice based on literature research and professionals' opinion. In cases where the data did not appear conclusive, recommendations



http://dentaltraumaguide.org

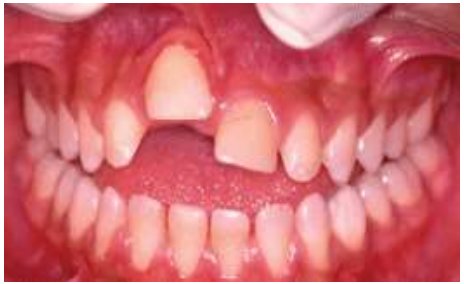
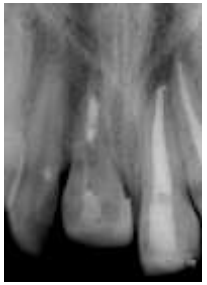
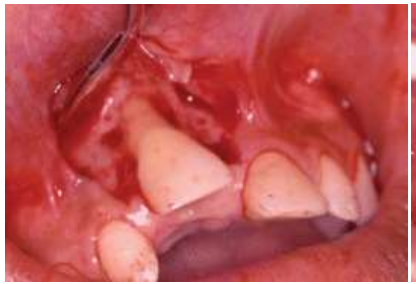
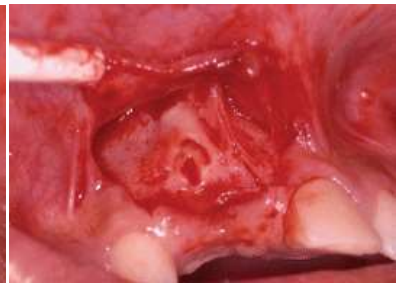

The goal in delayed replantation is,
… to maintain alveolar bone contour

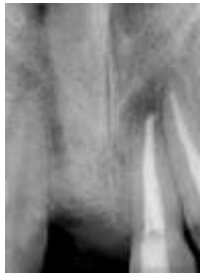
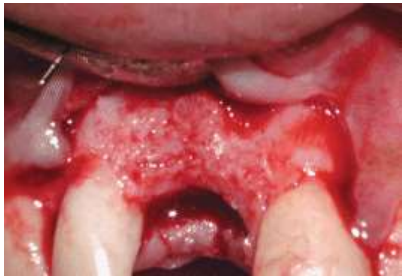
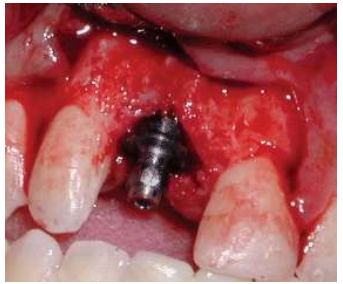
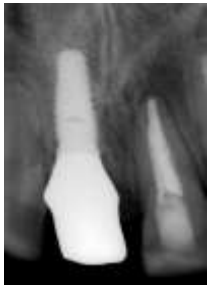
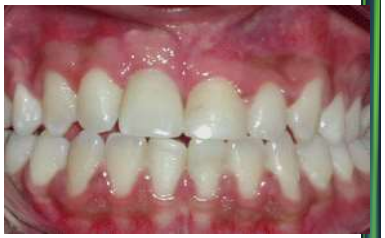
# Pasientkasus #1: Dekoronering av ankylosert tann



Crossner, 2013

# Pasientkasus #1: Dekoronering av ankylosert tann

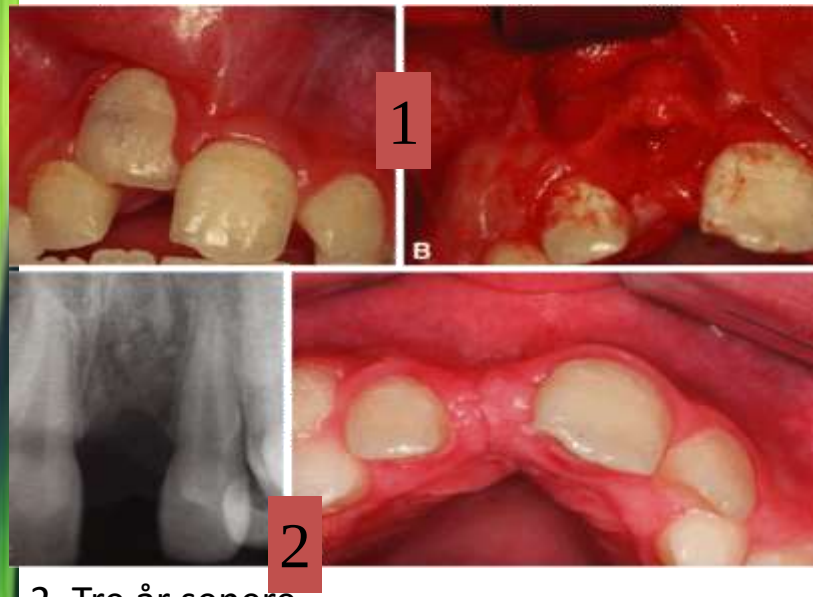





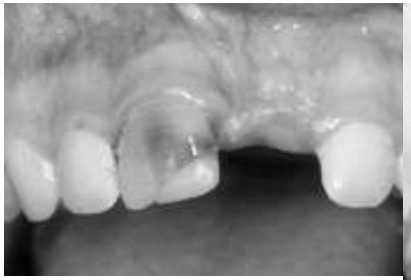






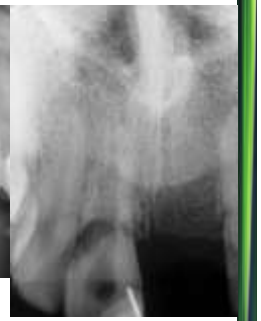
Cohenca & Stabholz , 2007

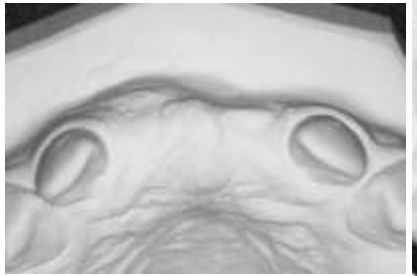
# Pasientkasus #1: Dekoronering av ankylosert tann

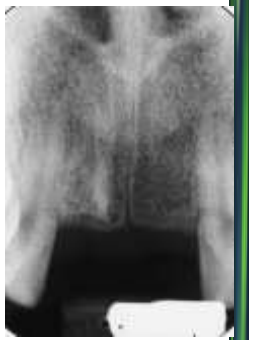
Pasient 11-år





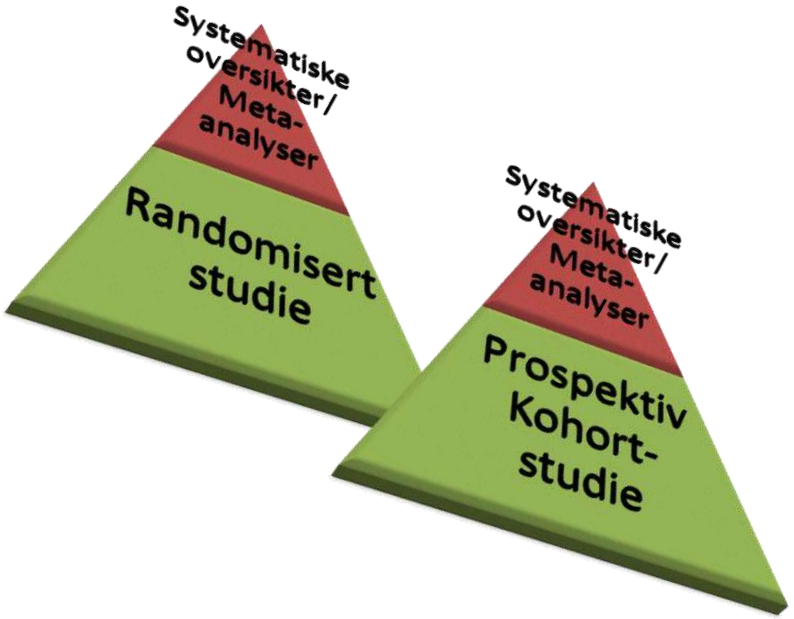




2. Tre år senere
- Vertikal ben koronalt
- Vertikal dimensjon av alveolarprosessen bevart
- Rot har hatt proporsjonal apikal bevegelse

Schwarz-Arad, 2004

Filippi et al., 2001




# PROBLEMATIKK MHT EVIDENS FRA KLINISKE STUDIER – RANDOMISERTE STUDIER

# Vitenskapelig kunnskap og evidensnivå


Day P, Duggal M. Interventions for treating traumatised permanent front teeth: avulsed (knocked out) and replanted. Cochrane Database Syst Rev 2010

n=3

de Souza RF, ea. Interventions for treating traumatised ankylosed permanent front teeth. Cochrane Database Syst Rev 2010.

N=0

# Randomiserte kliniske studier


Er bare gjennomførbare hvis

1. Forskere er usikre* fordi det ikke foreligger entydige vitenskapelige data
2. Gode indikatorer for at en ny behandling er bedre enn en etablert metode ("kontroll")

*"Equipoise" = ~ "faglig usikkerhet"

# Randomiserte kliniske studier


Er bare gjennomførbare hvis

1. Forskere er usikre* fordi det ikke foreligger entydige vitenskapelige data
2. Gode indikatorer for at en ny behandling er bedre enn en etablert metode ("kontroll")
3. Potensielle deltakere i studien har ingen preferanser mht behandlings-alternativene
4. Potensielle klinikere i studien har ingen preferanser mht behandlings-alternativene

*"Equipoise" = ~ "faglig usikkerhet"

Under forutsetning av at det er nok koronal tannsubstans igjen:

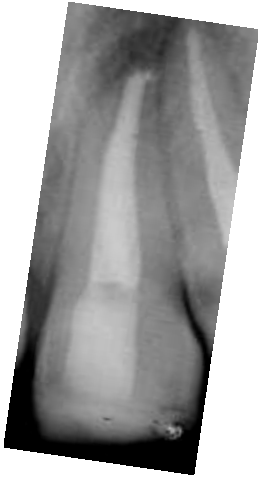
A. En slik tann skal alltid først forsøkes revideres av en spesialist

B. En slik tann skal alltid først forsøkes revideres

C. En revisjon har så god prognose at det bør anbefales først

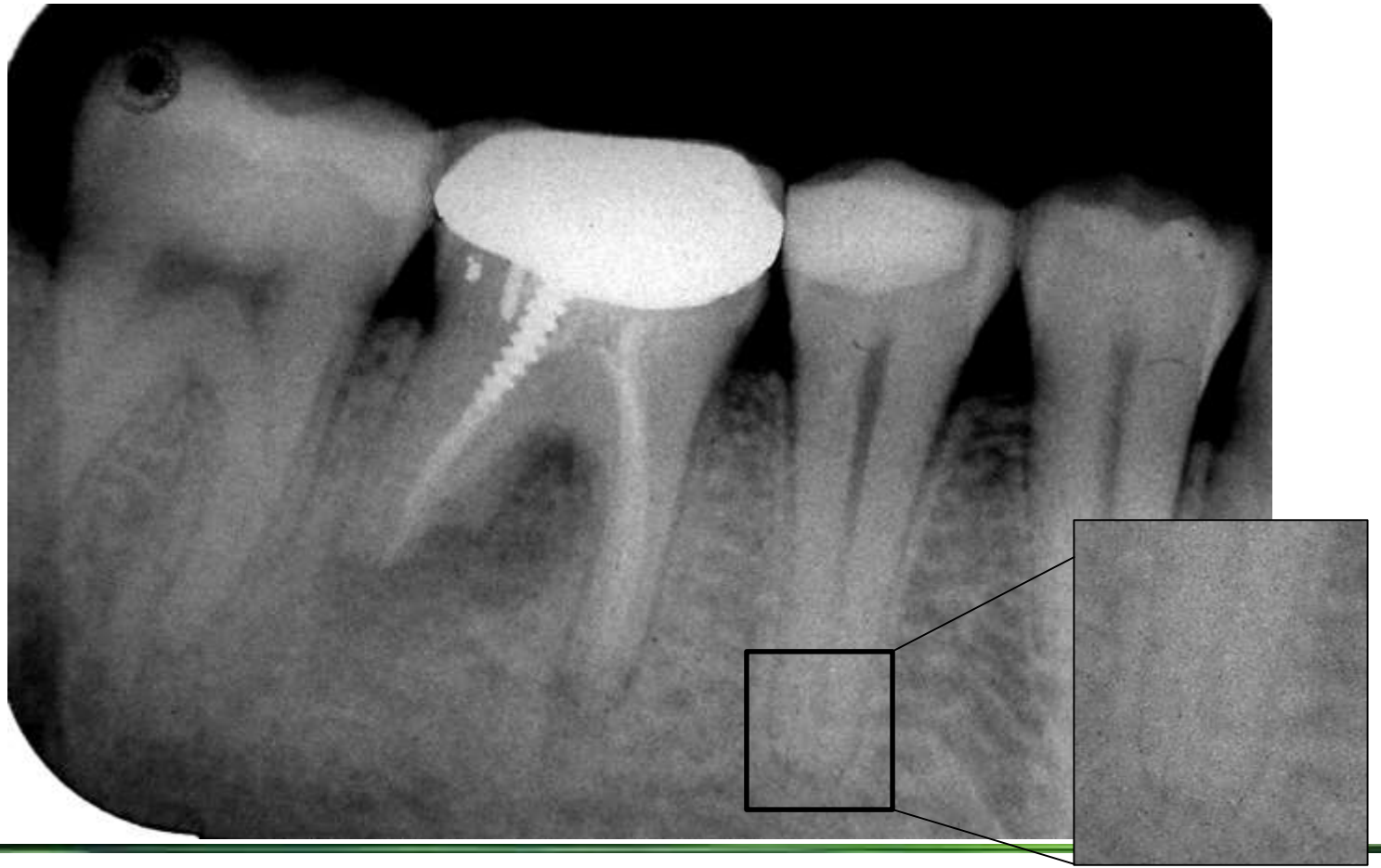
D. En revisjon er svært usikker, derfor kan ikke kostnaden forsvares

E. Et tannimplantat er alltid et bedre alternativ enn en revisjon



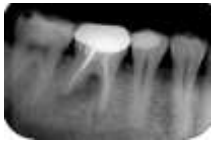
# 2. TANNA MED EN USIKKER ROTFYLLING – NÅR GJØR VI ENDOREVISJON FØR NY KRONE OG NÅR ANBEFALER VI HELLER EKSTRAKSJON?

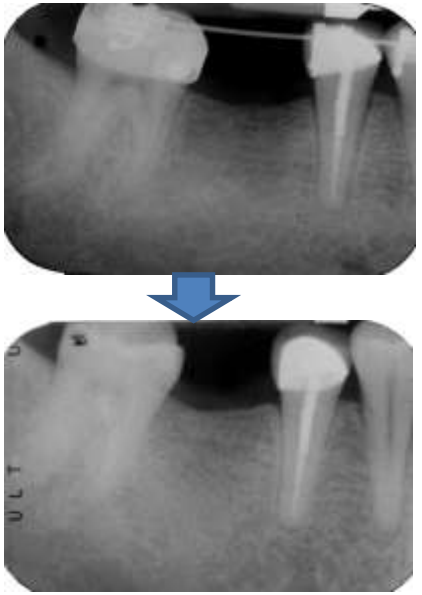
# Pasientkasus #2 : Usikker rotfylling

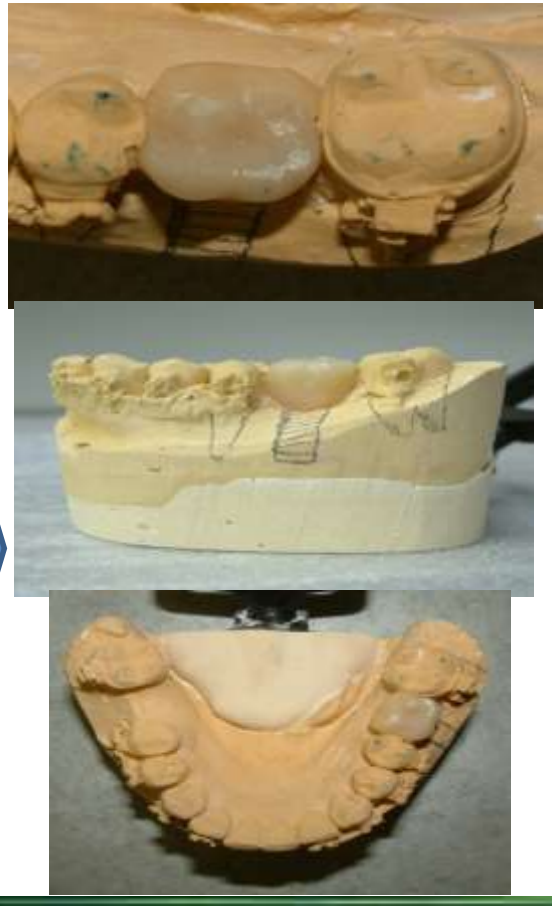


Lin, 2009

# Pasientkasus #2 : Usikker rotfylling

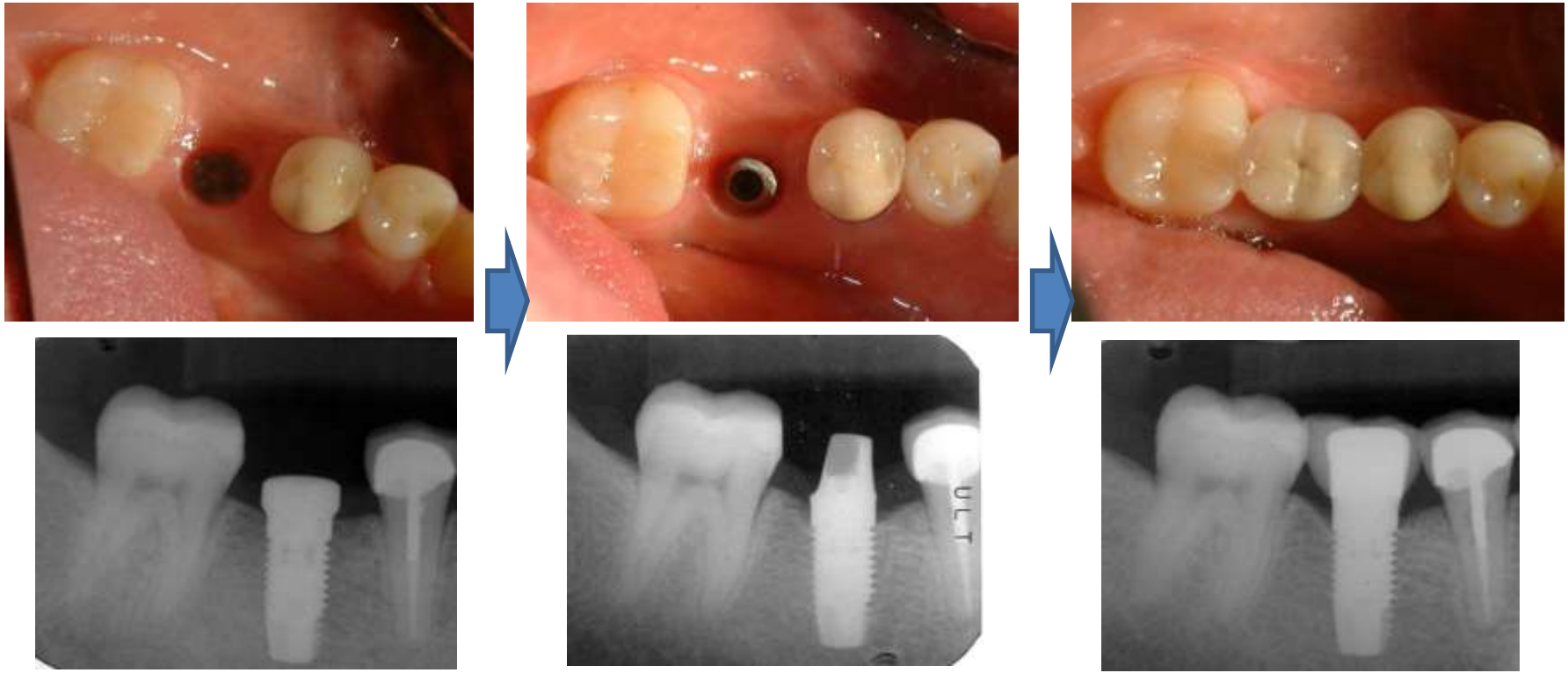






Lin, 2009

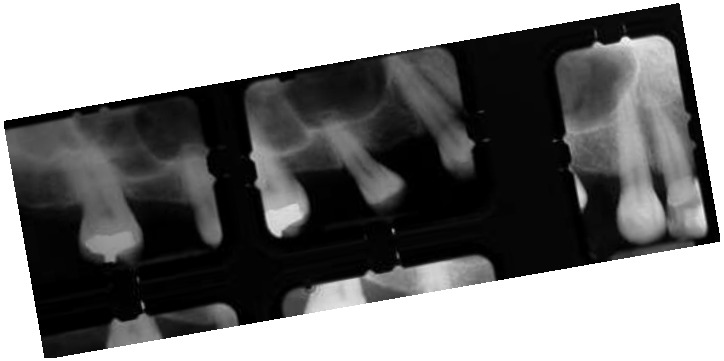
# Pasientkasus #2 : Usikker rotfylling

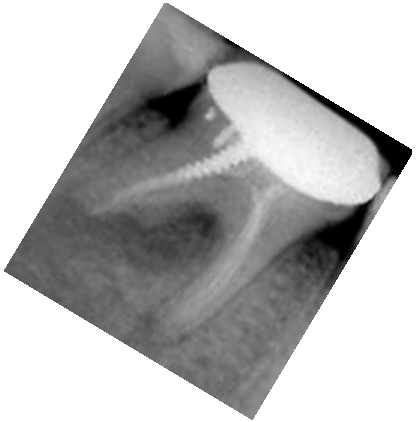


Lin, 2009

# Vitenskapelig kunnskap og evidensnivå

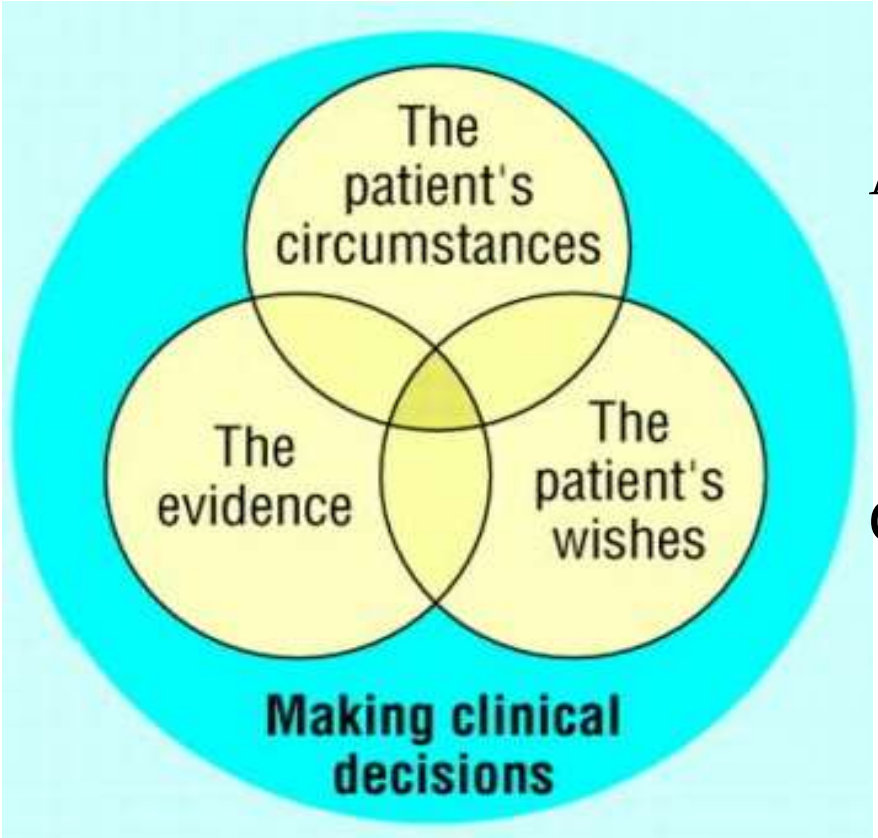

1. Setzer FC, Kim S. Comparison of long-term survival of implants and endodontically treated teeth. J Dent Res 2013; prepub
2. Tomasi C, et al. Longevity of teeth and implants - a systematic review. J Oral Rehabil 2008;35 Sup 1:23-32.
3. Blicher B, et al. Endosseous implants versus nonsurgical root canal therapy: a systematic review of the literature. Gen Dent 2008;56:576-80
4. Holm-Pedersen P, et al. What are the longevities of teeth and oral implants? Clin Oral Implants Res 2007;18 Sup 3:15-9.
5. Iqbal MK, Kim S. For teeth requiring endodontic treatment, what are the differences in outcomes of restored endodontically treated teeth compared to implant-supported restorations? Int J Oral Maxillofac Impl 2007;22 Sup:96-116.
6. Torabinejad M, et al. Outcomes of root canal treatment and restoration, implant-supported single crowns, fixed partial dentures, and extraction without replacement: a systematic review. J Prosthet Dent 2007;98:285-311.

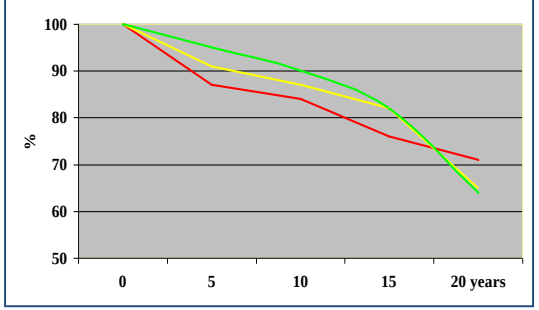


# PROBLEMATIKK MHT EVIDENS FRA KLINISKE STUDIER – DET ER TIL SYVENDE OG SIST PASIENTEN SOM BESTEMMER VALGET AV BEHANDLING

# Evidens-
# Basert Praksis:



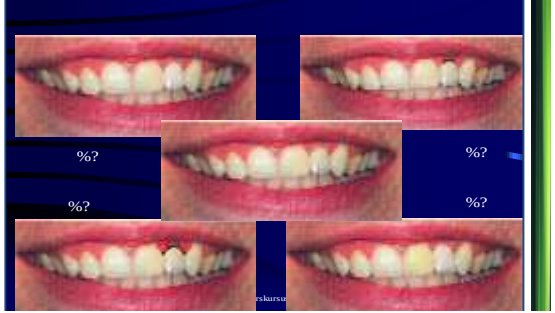

Fra: Haynes et al. BMJ 1998;317:273-6



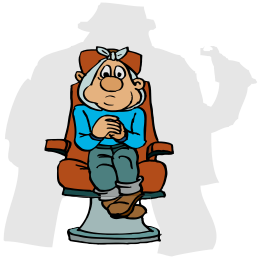

## Holdbarhet

| Independent variables | Bi-variate odds ratios | Bivariate significance | 95% Confidence intervals bivariate odds ratios | Multi-variate odds ratios | Multivariate significance | 95% Confidence intervals for multivariate odds ratios |
|---|---|---|---|---|---|---|
| *Age group* | | | | | | |
| *20-30* | - | - | - | - | - | - |
| *30-40* | 2.32 | ** | 1.15 - 3.13 | 2.52 | ** | 1.35 - 3.33 |
| *+40* | 2.63 | *** | 1.43 - 3.08 | 2.63 | *** | 1.83 - 3.8 |
| *Gender* | | | | | | |
| *Male* | - | - | - | - | - | - |
| *Female* | 2.42 | ** | 1.61 - 2.79 | 2.12 | ** | 1.91 - 2.9 |
| *Material* | | | | | | |
| *Amalgam* | - | - | - | - | - | - |
| *Composites* | 1.12 | NS | 0.13 - 1.56 | 1.42 | NS | 1.13 - 1.96 |
| *Glass ionom.* | 3.12 | *** | 2.52 - 4.34 | 5.65 | ** | 4.67 - 7.23 |
| *Dentists* | | | | | | |
| *#1* | - | - | - | - | - | - |
| *#2* | 1.34 | NS | 0.35 - 1.61 | 1.04 | NS | 1.35 - 2.01 |
| *Location* | | | | | | |
| *Mandible* | - | - | - | - | - | - |
| *Maxilla* | 1.55 | * | 1.17 - 2.04 | 1.15 | * | 1.57 - 2.14 |

## Risikofaktorer



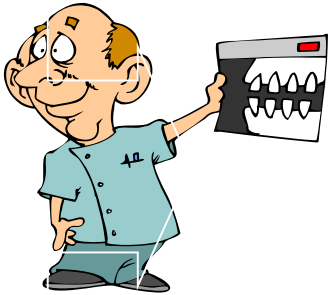

## Sannsynlighet resultat



Tannlege:pasient relasjon

**To-veis k**ommunikasjon

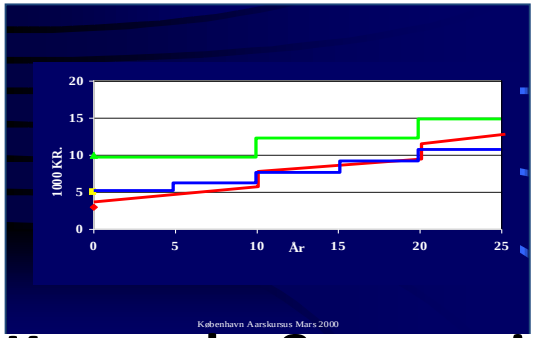
←---------- →



**Bli enige om b.h.plan**

**→ informert samtykke**

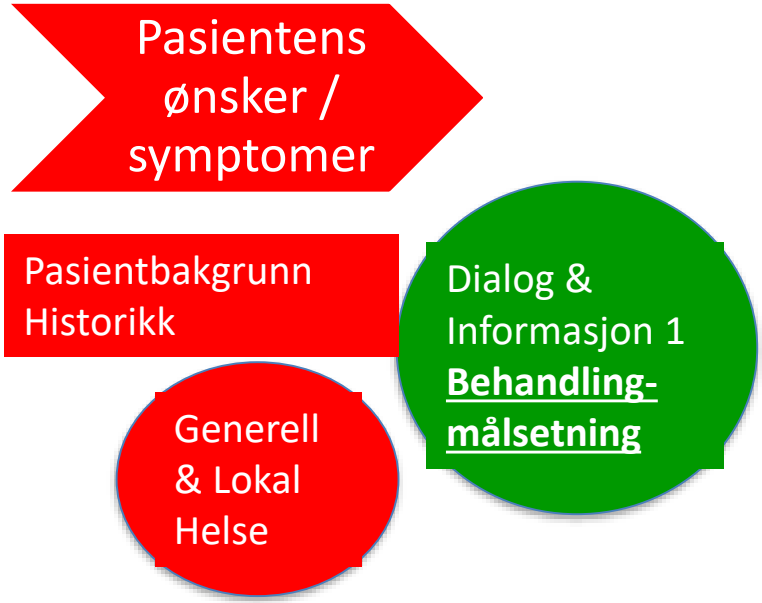

## Endring livskvalitet




## Kostnader& -over tid

## Verst mulig scenarier

# God Klinisk praksis – 1/5



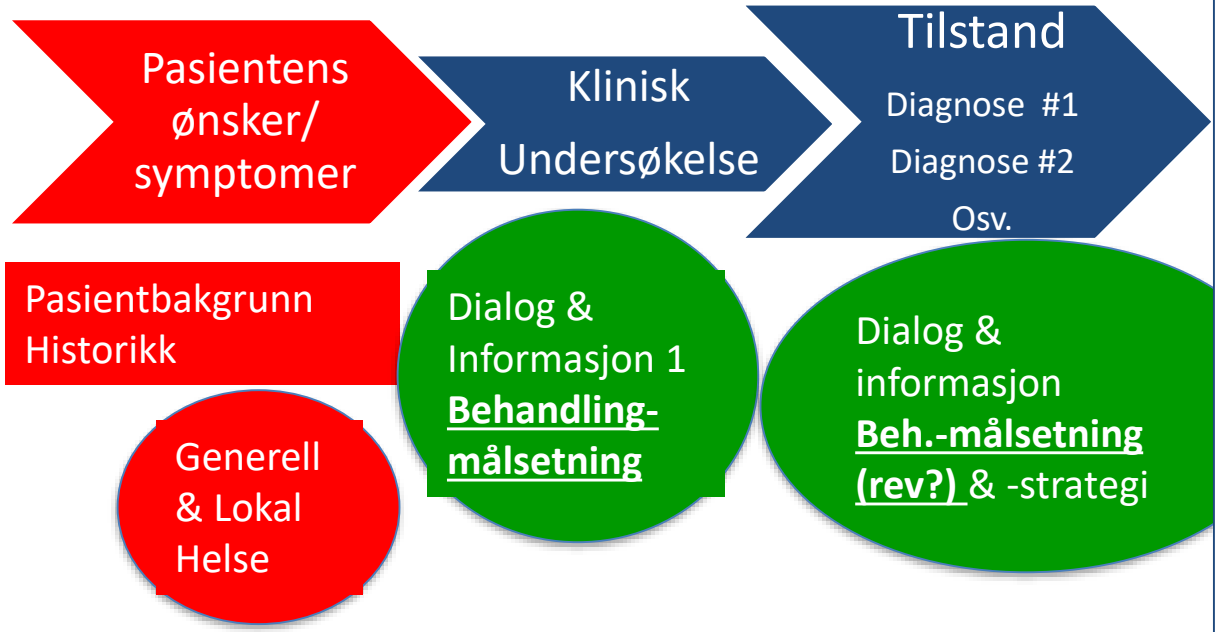

- Ønsker
- Preferanser
- Prioriteringer
- Forventninger

# God Klinisk praksis – 2/5


- Kliniske funn
- Røntgenfunn
- Diagnostiske tester
  - Gyldighet
  - Gevinst

- Patologi
- Dysfunksjon
- Disharmoni
- Psykologi

# God Klinisk praksis – 3/5



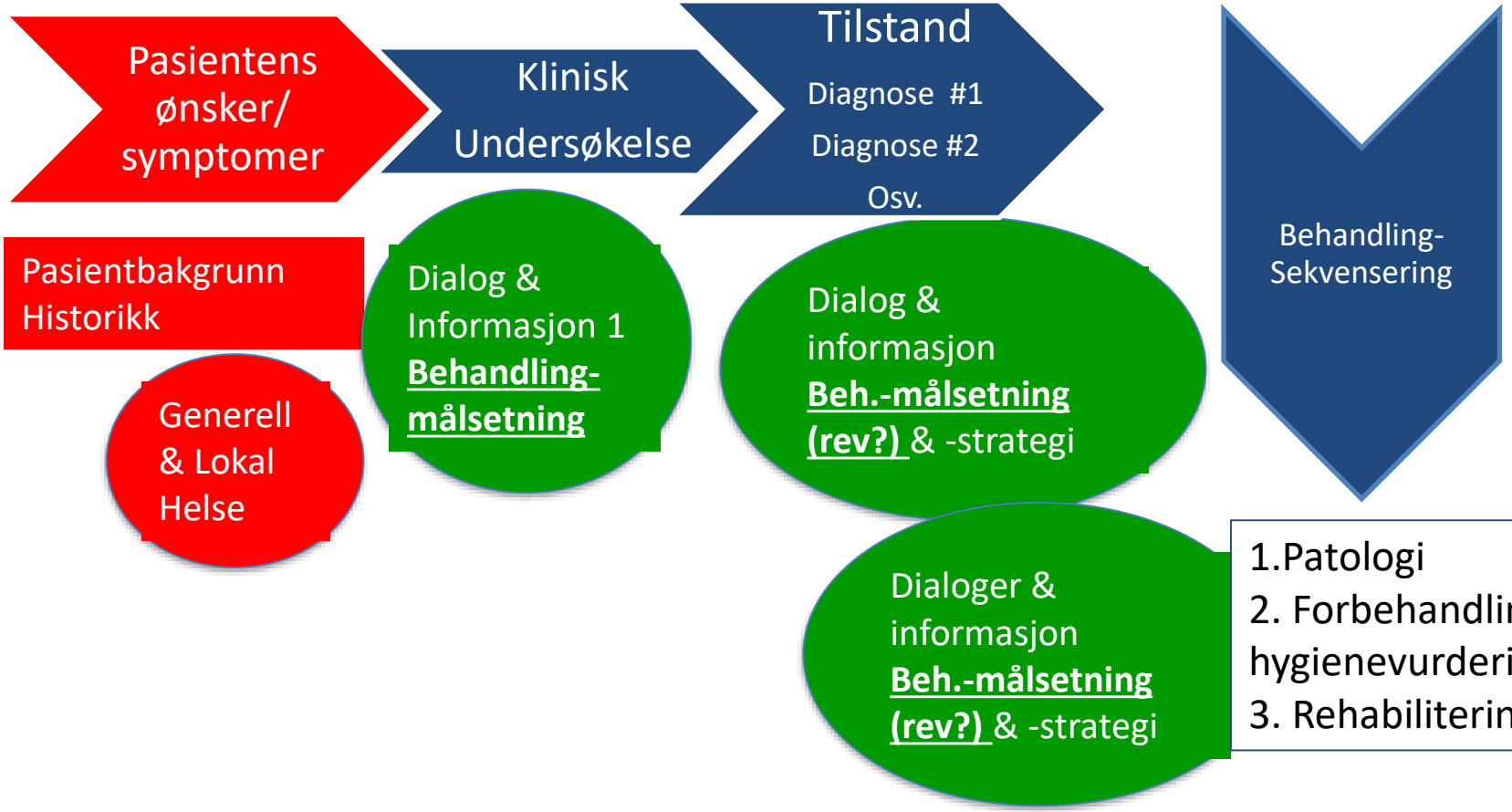

- Kliniske funn
- Røntgenfunn
- Hygienevurdering
- Behandlingsalternativ
- Antatt prognose
- Kostnadsoverslag
- Evt. refusjoner
- Evt. henvisninger

Informasjon:

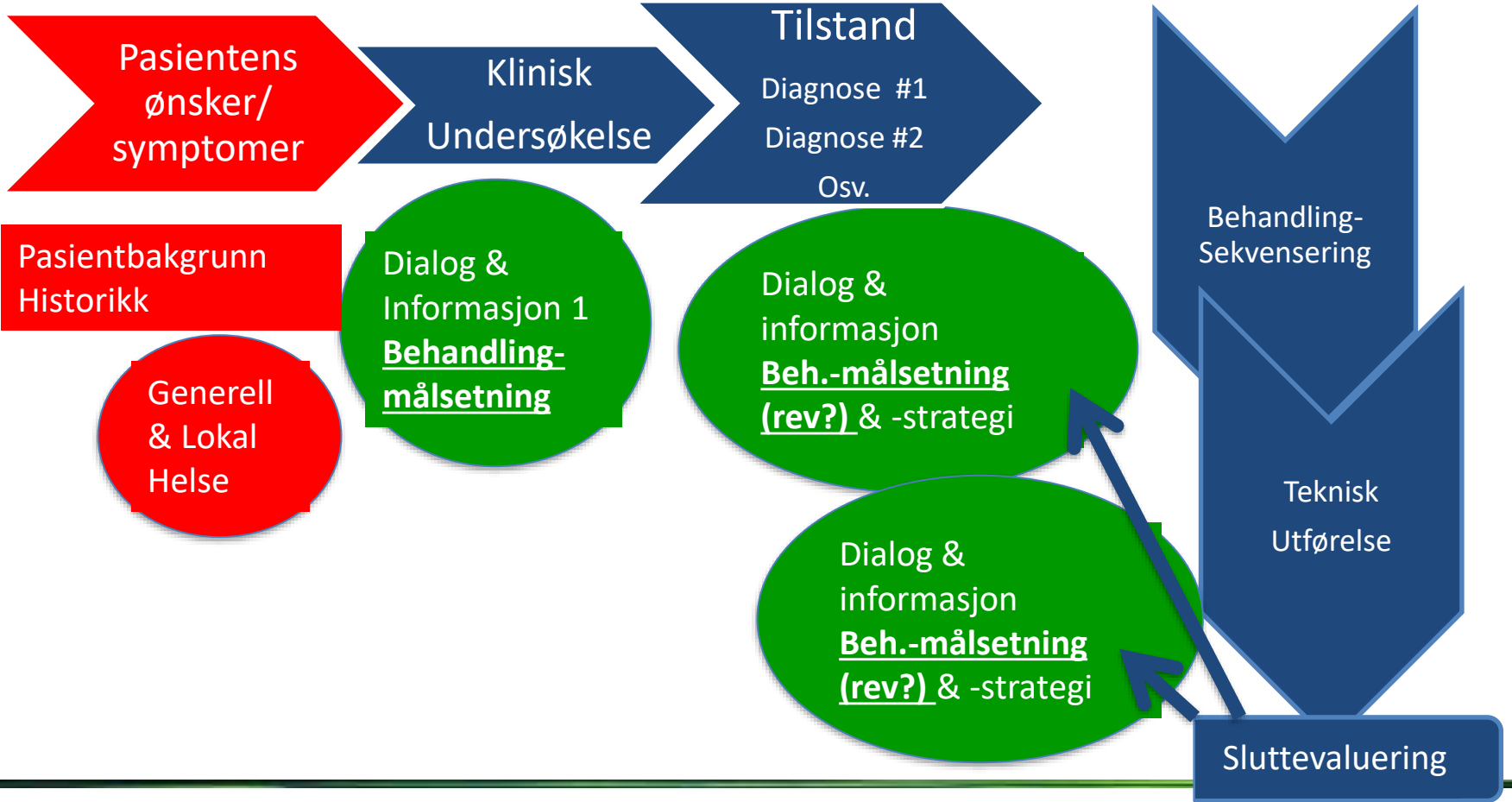
- Forebygging av skader
- Begrensning av skadeutvikling
- Opplæring i egenomsorg

- Informert samtykke

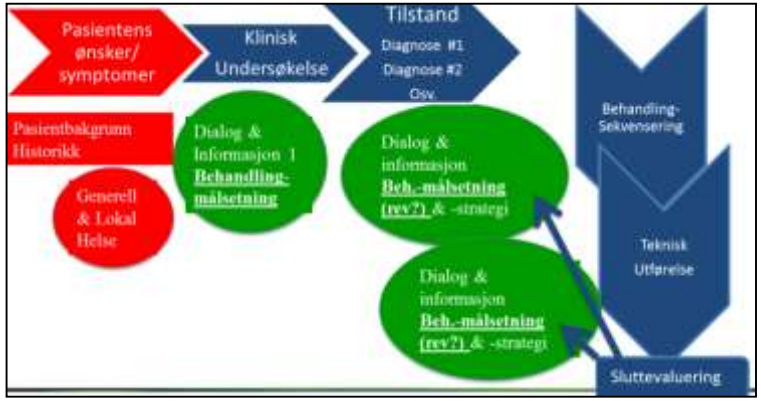
# God Klinisk praksis – 4/5

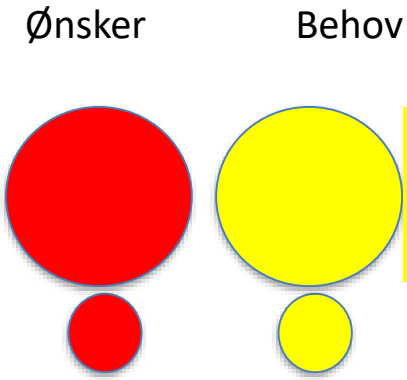


# God Klinisk praksis 5/5



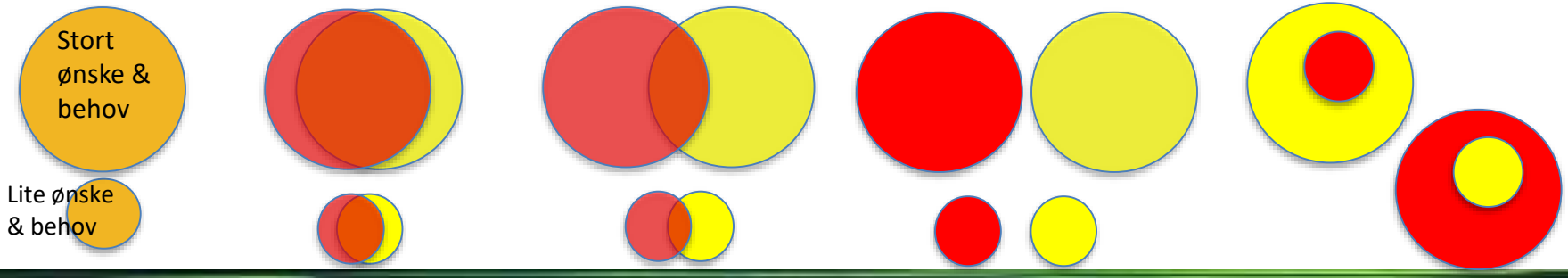
# God klinisk praksis : pasient ønsker vs. behov



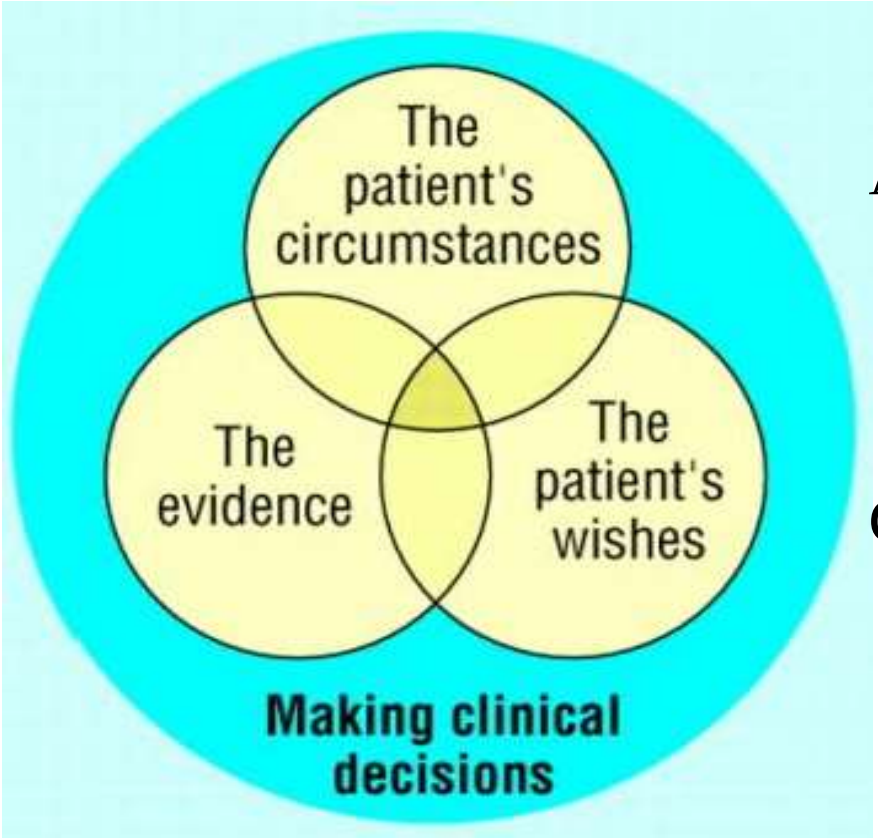




«Nødvendig (tann)-behandling»

| Ønsker & behov samstemt | Ønsker & behov delvis samstemt | Ønsker & behov dårlig samstemt | Ønsker & behov ikke samstemt | Ønsker en liten del av stort behov, eller omvendt |
|---|---|---|---|---|

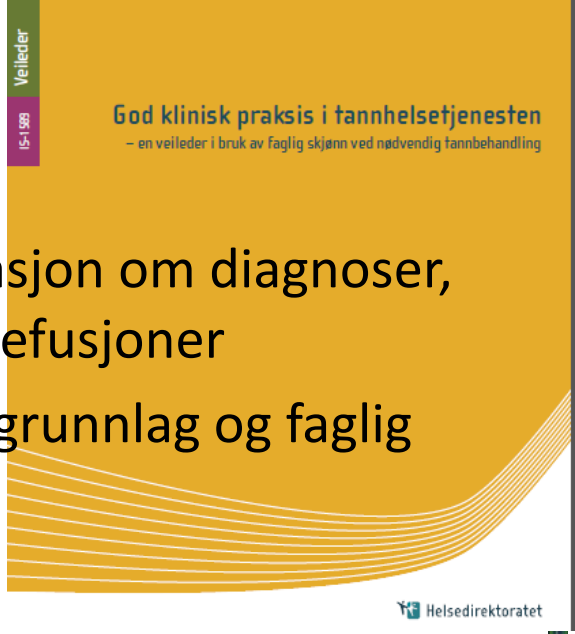


# Evidens-
# Basert Praksis:




Fra: Haynes et al. BMJ 1998;317:273-6

# God klinisk praksis




B
- Gi pasienten medbestemmelsesrett etter informasjon om diagnoser, alternativer, prognoser, kostnader og eventuelle refusjoner

C
- Gi den beste behandling ut fra dagens kunnskapsgrunnlag og faglig konsensus

C/D
- Bevare vev

D
- Opprettholde funksjon, estetikk og sikre pasientens sosiale funksjon

D
- En optimal og adekvat behandling ut fra forsvarlig klinisk skjønn og pasientens forutsetninger og behov

D
- Sikre pasienten rett behandling og samtidig ikke påføre ham/henne unødig tidstap eller utgifter

# ”Relativ god” klinisk praksis finnes ikke

FAGARTIKKEL

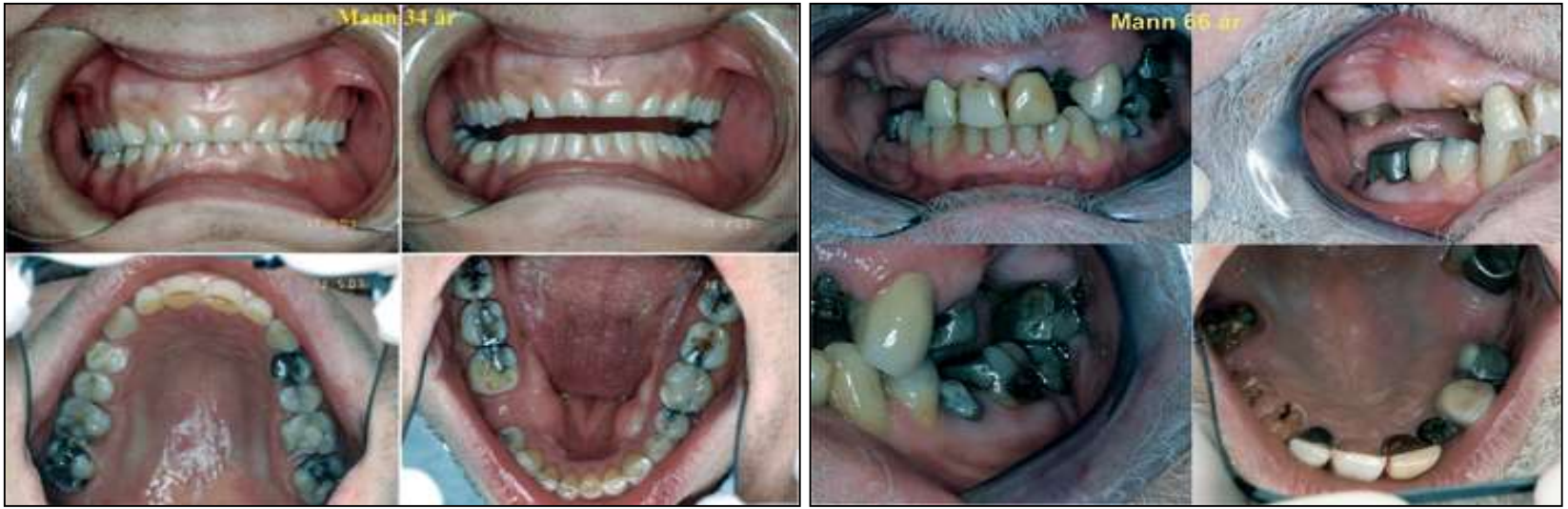
Nor Tannlegeforen Tid 2004; 114: 554–9

Harald M. Eriksen, Ida Koll-Frafjord og Ingvild Nærum Heier

## Diagnostikk og behandlingsplanlegging

Eksempler på variasjon i forslag til tannbehandling

Beskrev to konsepter:
**Forsvarlig minimumsbehandling**
&
**Optimal behandling** («*tid og økonomi spiller ingen rolle*»)



# TV 2 hjalp neppe noen tannlege

I desember i fjor hadde programposten «TV 2 hjelper deg» et innslag som forteller om til dels svært varierende behandlingsforslag og priser hos tre Oslotannleger. En professor fra Odontologisk fakultet ble også konsultert for å gi sin vurdering av behandlingsforslagene til seerne. Hans uttalelser i programmet har vakt negative reaksjoner, og han ble også innklagd til NTFs etiske råd. I mars innkalte Oslo tannlegeselskap til møte om saken. Det ble fullt hus.

I løpet av et knappe tre minutters innslag følger vi TV 2-reporteren til tre ulike tannleger, uten at tannlegene blir gjort oppmerksom på at det er en journalist på jobb de har i stolen. Kamera og mikrofon er altså ikke med i de tre konsultasjonene, men seerne får gjengitt behandlingsforslagene, i omfang og pris. Ved Institutt for klinisk odontologi er kamera med, og det er fra denne avsnitt mesteparten av det endelige innslaget er hentet.

Det som kommer frem i TV 2-innslaget er at to av de tre tannlegene, som jobber ved Colosseumklinikken og Galleri Oslo Klinikken, har presentert nesnlunde like forslag til behandling, til omtrent samme pris, mens den siste tannlegen, som arbeider ved Byporten Tannlegesenter, har levert et mye mer omfattende behandlingsforslag til en langt høyere pris.

**Rollen til institutt for klinisk odontologi**

Når TV 2 henvender seg til Institutt for klinisk odontologi, blir de bedt om å lage et eget behandlingsforslag, og å kommentere de behandlingsforslag TV 2-journalisten har innhentet hos de tre andre tannlegene. Oppgaven blir av Institutttslederen gitt til professor i kariologi, Morten Rykke.

> Instituttets rett og plikt til å uttale seg i faglige spørsmål er utdiskutert

I samtlingen omtaler han de to førstnevnte behandlingsforslagene som greie, mens han sier at det siste provoserer kraftig. – Det som her er umiddelbart er altfor omfattende. Når det så klart ikke ligger faglige vurderinger til grunn, er det nærliggende å tro at dette skylder økonomiske motiver, sier Rykke, og legger til, som et råd til alle som er på jakt etter en tannlege: – Styr unna Gule sider. Der er det markedskreftene som rår. Ring heller venner eller kjente og spør om de har en tannlege å anbefale.

**Burde vært mer nyansert**

Byporten Tannlegesenter, Bergen Tannlegeforening og Sør-Trøndelag Tannlegeforening har etter TV 2s omtale henvendt seg til NTFs råd for tannlegeetikk, idet det blant annet påpekes at Rykke ikke har tatt kontakt med de gjeldende tannleger før han uttaler seg. Det vises til paragraf 17 i det etiske regelverket, som omhandler tannlegenes forhold til kolleger, der det heter at: Før en tannlege omgjør/tilfører, eller uttaler seg om en tidligere behandling, skal – om mulig – tannlegen kontakte angjeldende kollega.

På dette punktet konkluderer Rådet, selv om det har drøftet seg om en person som er konsultert som sakkyndig og det kan være drøftet seg om behandlingsforslag, med at tannlege Rykke burde tatt kontakt med de tannleger som hadde utarbeidet behandlingsforslagene før han karakteriserte disse. Rådet synes også at Rykke

*Professor Morten Rykke i «TV 2 hjelper deg» 1. desember 2004. Bildet er hentet fra TV 2s sending.*



DEN NORSKE TANNLEGEFORENINGS

TIDENDE

INNHOLD STILLINGER · KJØP OG SALG MENINGER

## «Ikke stol på tannlegen!»

doktoronline

Forum Kreft Hjerte Infeksjon Medikament

Tannhelse

# Ikke stol for mye på tannlegen

**Hele 17 av 20 tannleger gir for dårlig behandling. Mange overser store hull, mens andre foreslår unødvendig behandling.**

Snorre Schiønberg

OVERSER HULL: 17 av 20 tannleger gir for dårlig behandling, viser en ny undersøkelse. ILLUSTRASJONSFOTO

# 17 av 20 tannleger ga dårlig behandling

Mediehuset

TULL MED HULL: Forbrukerrådets test av tannleger avdekker store og bekymringsverdige kvalitetsforskjeller. Foto: Scanpix

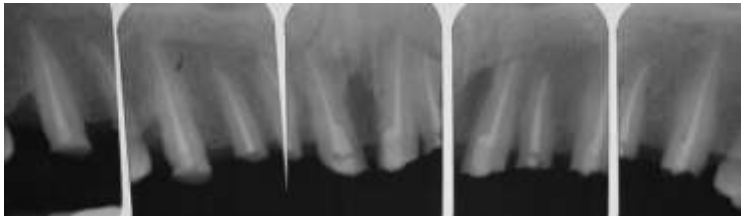
# Tannleger vil behandle hull som ikke finnes

**Test av tannleger avslører graverende forhold. Sjekk resultatene.**

# Tannleger stryker i test

# Samme tenner - helt forskjellig behandling

Ulike tannleger foreslår helt forskjellig behandling på de samme tennene. – Du kan ikke stole på tannlegen din, mener Forbrukerrådet.



Under forutsetning av at rotfyllingen virker godt obturert klinisk og radiologisk og uten periapikale funn samt symptomfrihet anbefales:

A. Revisjon uansett dersom den har vært eksponert mer enn 3 mnd

B. Revisjon uansett dersom den har vært eksponert mer enn 1 uke

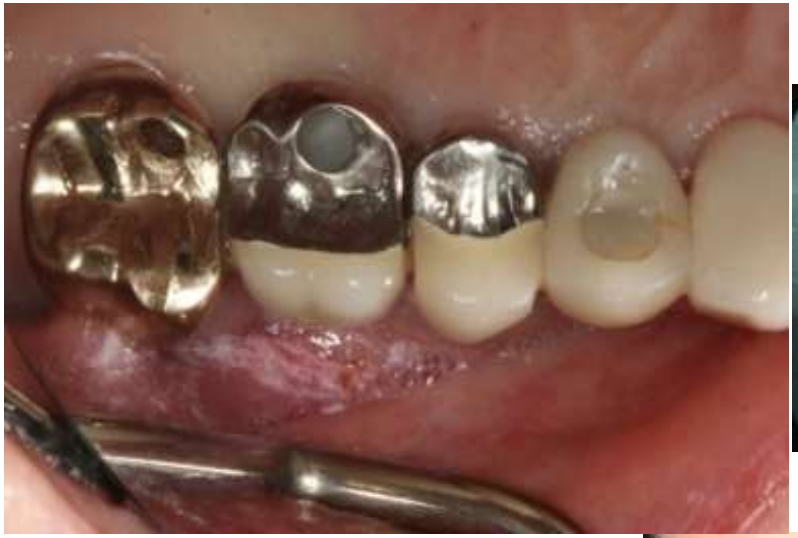
C. Revisjon hvis man kan vinne mer retensjon til en rotstift

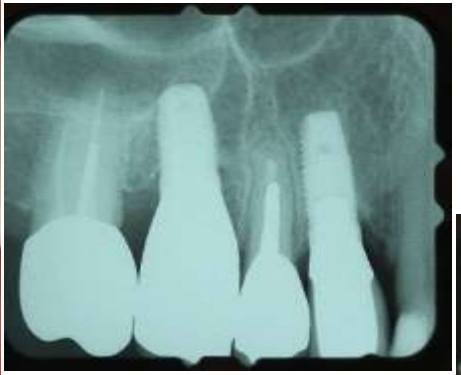
D. Revisjon bare hvis utførelsen virker teknisk enkel

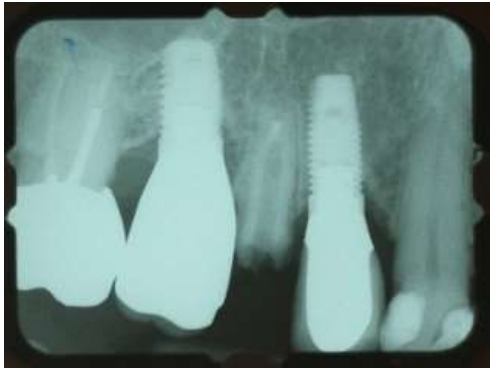
E. Ikke å revidere rotfyllingen

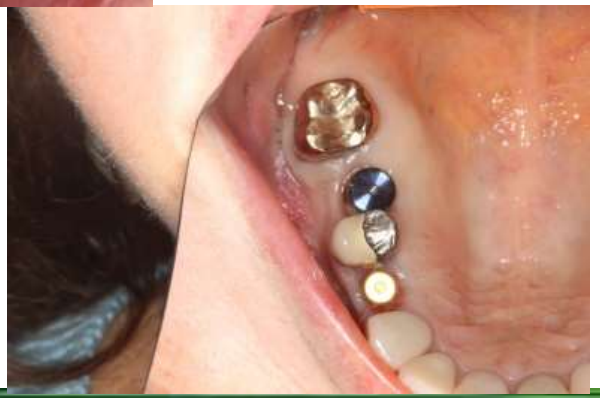
# 3. MÅ EN EKSPONERT TANNROT SOM ER ROTFYLT REVIDERES FØR KRONETERAPI?

# Pasientkasus #3 : Revisjon eller ikke



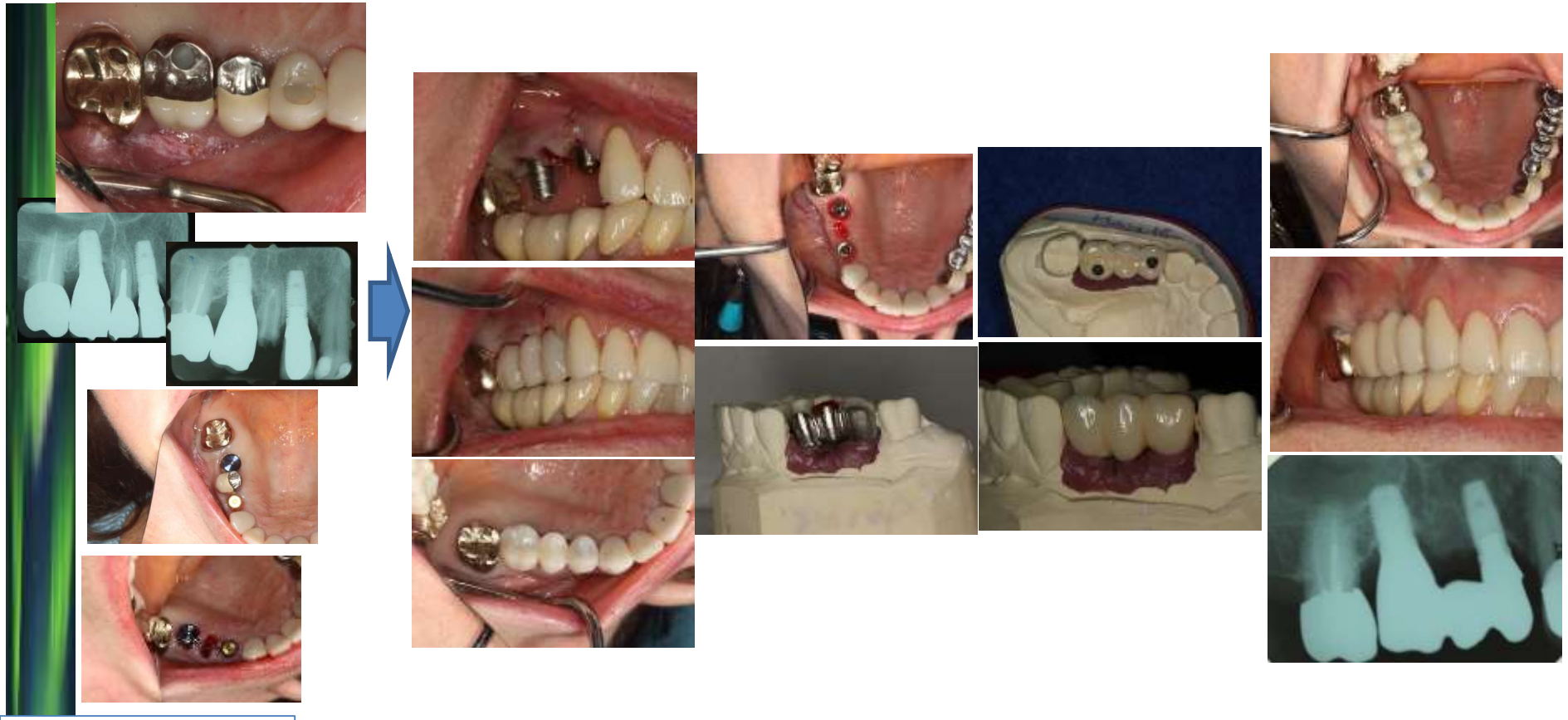






Ayliffe, 2011

# Pasientkasus #3 : Revisjon eller ikke



Ayliffe, 2011

# Vitenskapelig kunnskap og evidensnivå

## Is endodontic re-treatment mandatory for every relatively old temporary restoration?

### A narrative review

**David Kelnan, DMD, MSc, PhD, MHA; Joshua Moshonov, DMD; Ami Smidt, DMD, MSc**

Endodontists long have considered the success of endodontic treatment to be influenced by the quality of the coronal restoration. Researchers have recommended sealing of coronal restorations to prevent microorganisms in the oral environment from recolonizing the canal system and to bar nutrients in the oral environment from supporting microorganisms left in the canal system after treatment.[1] A possible association between coronal leakage and endodontic failure was first reported by Marshall and Massler[2] in their radioisotope leakage study of extracted endodontically treated teeth. The interest in microleakage subsequently developed into a major thrust of endodontic research, and by the 1980s, almost 20 percent of the articles published in Journal of Endodontics dealt with this issue. However, the majority of these studies were conducted as short research projects by graduate students who used a diverse array of methods, thereby making comparisons difficult. Indeed, the studies


## ABSTRACT

**Objectives and Background.** In this review, the authors examine whether there is any decisive evidence to support the revision of root fillings that have been exposed to the oral environment for more than three months, undertaken solely because of suspicions of microleakage. Researchers in numerous endodontic studies have addressed the evaluation of coronal microleakage by using different tracers and techniques. The need to achieve a tight, permanent coronal seal as soon as possible after the completion of endodontic treatment is obvious. However, the clinical importance of microleakage studies recently has been questioned because of their wide range and even contradictory results, and findings from only a few clinical investigations have demonstrated a clear relationship between the endodontic success rate and failure rate owed to coronal microleakage in cases involving high-quality endodontic therapy.

**Methods.** The authors analyzed commonly cited articles regarding the clinical relevance of microleakage studies and the success rate of teeth with compromised restorations.

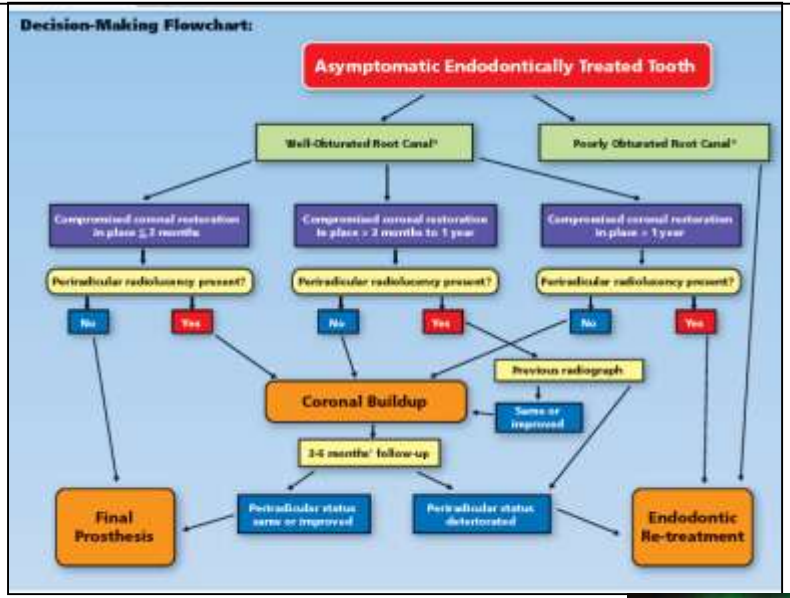
**Conclusions.** In a review of the literature, the authors found no clear evidence to support immediate replacement of well-obturated endodontic treatment that has lasted more than three months solely because of suspicions of microleakage. It may be prudent in such cases to make a new coronal restoration immediately and to observe the tooth for at least three months before placing the permanent crown.


**Key Words.** Microleakage; coronal restoration; endodontic success.

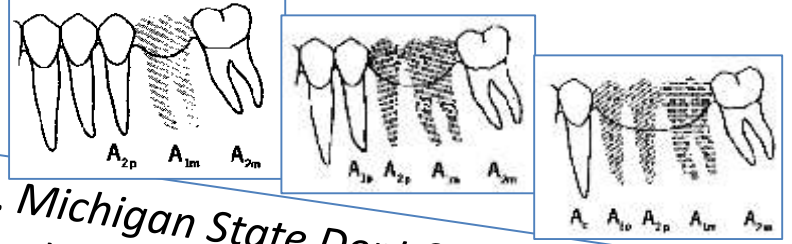
*JADA 2011;142(4):391-396.*

Dr. Kelnan is an instructor, Department of Endodontics, School of Dental Medicine, The Hebrew University-Hadassah, Jerusalem. He also is head

Guide for the clinician's decision making regarding endodontic revision of asymptomatic teeth.




Ante IH. The fundamental principles of abutments. *Michigan State Dent Soc Bull 1926; 8: 14-23*: The total periodontal membrane area of the abutment teeth must equal or exceed that of the teeth to be replaced. The length of the periodontal membrane attachment of an abutment tooth should be at least ½ or 2/3 of that of its normal root attachment.



A. En tann er uegnet som pilar hvis festetapet er >30%

B. En tann er uegnet som pilar hvis festetapet er >40%

C. En tann er uegnet som pilar hvis festetapet er >50%

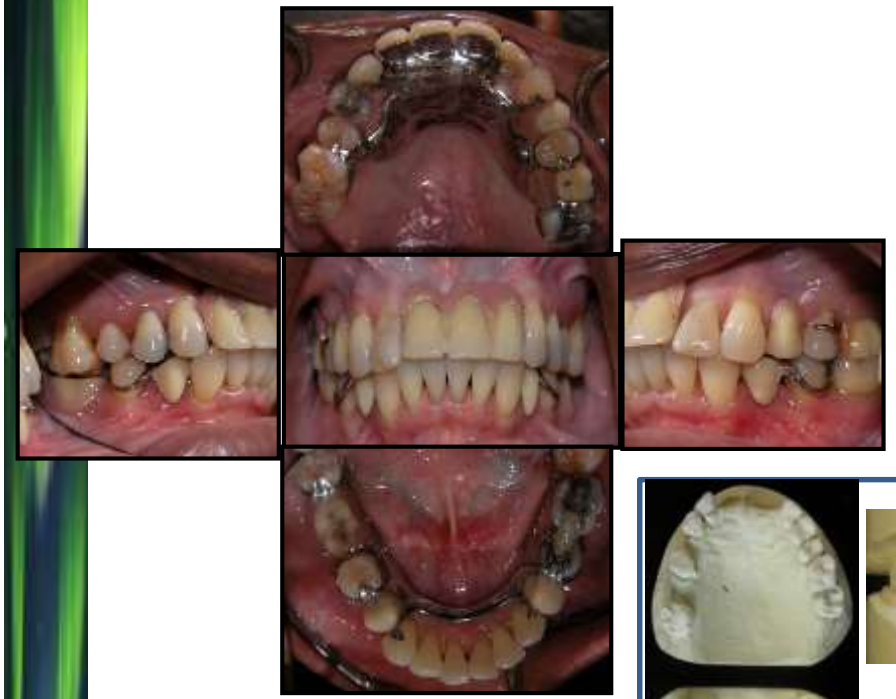
D. En tann er uegnet som pilar hvis festetapet er >60%

E. En tann er uegnet som pilar hvis festetapet er >70%

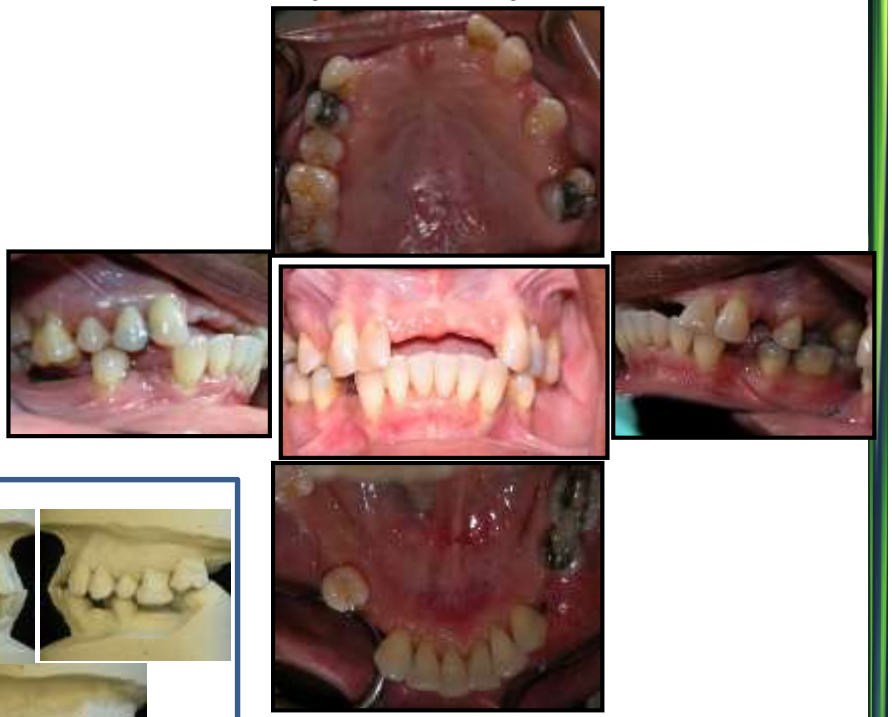
# 4. HVOR MYE PERIODONTALT FESTETAP ER FOR MYE FESTETAP FOR EN BRO?

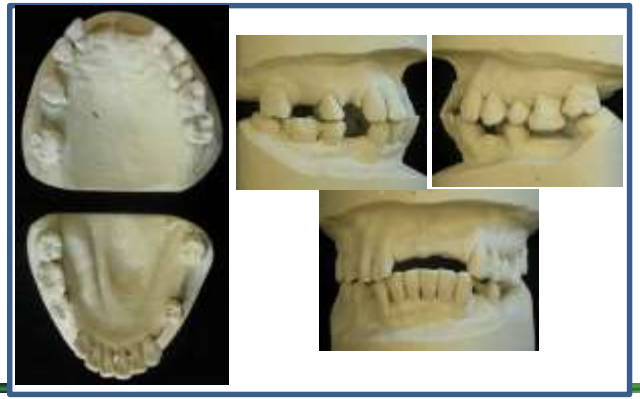
# Pasientkasus #4 : Periodontalt feste

Med partiell protese



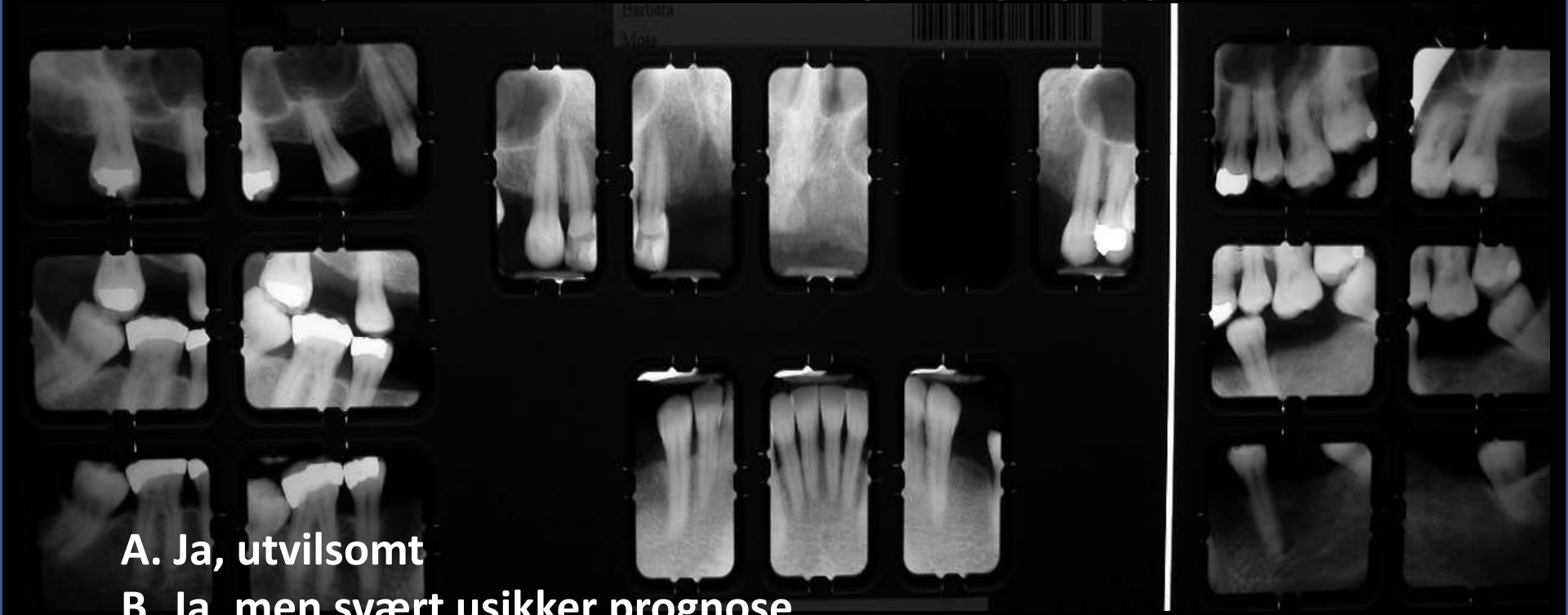
Uten partiell protese





Kermali, 2009

# Fast bro i Okj?  (Periodontalbehandling ferdig og hygienen er OK)



**A. Ja, utvilsomt**

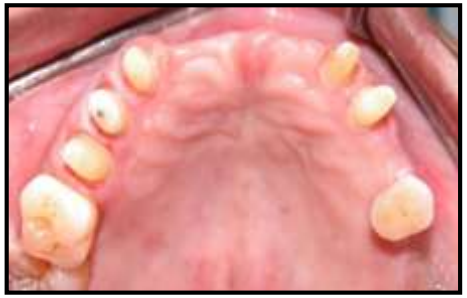
**B. Ja, men svært usikker prognose**

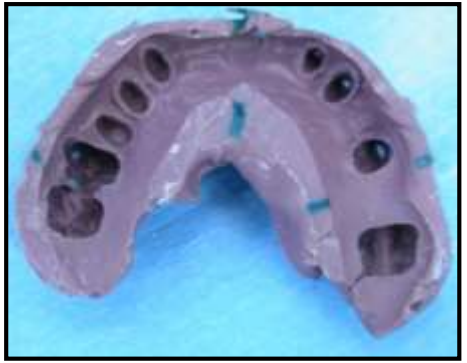
**C. Utfører bare dersom pasienten bærer risikoen**

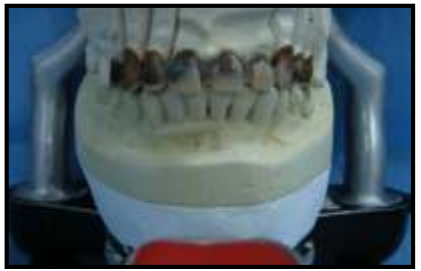
**D. Nei, prognosen er for usikker**

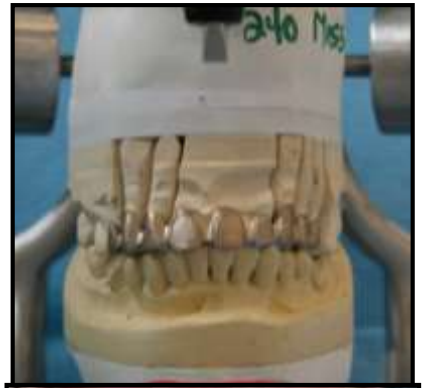
**E. Nei, av andre grunner**

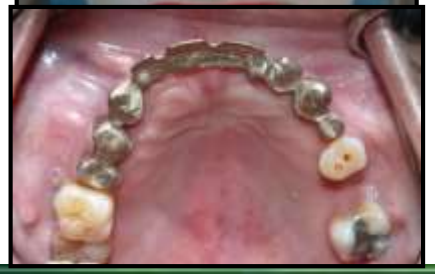
# Pasientkasus #4 : Periodontalt feste





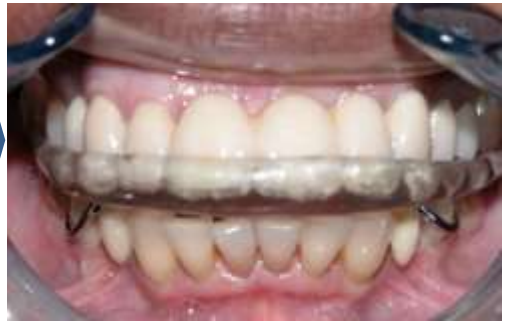




Kermali, 2009

# Pasientkasus #4 : Periodontalt feste



Kermali, 2009

# Vitenskapelig kunnskap og evidensiv


*Martina Lulic*
*Urs Brägger*
*Niklaus P. Lang*
*Marcel Zwahlen*
*Giovanni E. Salvi*

## Ante's (1926) law revisited: a systematic review on survival rates and complications of fixed dental prostheses (FDPs) on severely reduced periodontal tissue support

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**Key words:** fixed dental prosthesis, fixed partial denture, fixed prosthodontics, fixed reconstruction, oral rehabilitation, periodontal disease, periodontal support, periodontitis

**Abstract**

**Background:** In subjects suffering from generalized severe periodontitis, only a few teeth may be treated and used as abutments for fixed dental prostheses (FDPs).

**Objective:** To systematically review the impact of severely reduced, but healthy periodontal tissue support on the survival rate and complications of FDPs after a mean follow-up time of at least 5 years.

**Search strategy:** Publications considered for inclusion were searched in MEDLINE (PubMed) and relevant journals were hand searched. The search was performed in duplicate and was limited to human studies published in the dental literature from 1966 up to and including September 2006. Only publications in English, in peer-reviewed journals, were considered. Abstracts were excluded.

**Selection criteria:** Prospective and retrospective cohort studies were included. The primary outcome measure included survival rates of FDPs and abutment teeth, whereas biological and technical complications of FDPs and abutment teeth represented secondary outcome measures.

**Data analysis:** Summary estimates of survival rates and of biological and technical complications were calculated after 5 and 10 years.

- Many teeth with substantially reduced periodontal tissue support have been extracted and replaced needlessly instead of being used as abutment teeth for FDPs
- Tooth mobility per se does not represent a pathological condition

A. Helkeram er langt bedre enn  metall-keram

B. Helkeram og metall-keram er nesten likeverdig, men helkeram er noe bedre

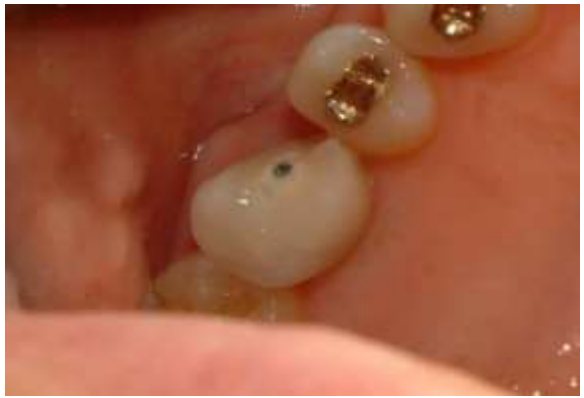
C. Helkeram og metall-keram er likeverdig så pasienten får bestemme

D. Metall-keram og helkeram er nesten likeverdig, men MK er noe bedre

E. Metall-keram er langt bedre enn helkeram

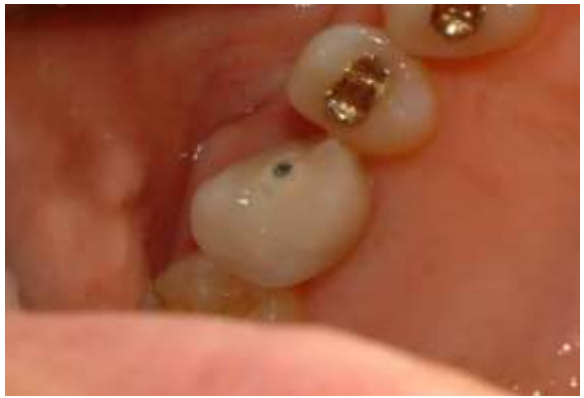
# 5. DEN NYE BROEN – BØR IKKE HELKERAM NÅ KUNNE ERSTATTE METALL-KERAMET?

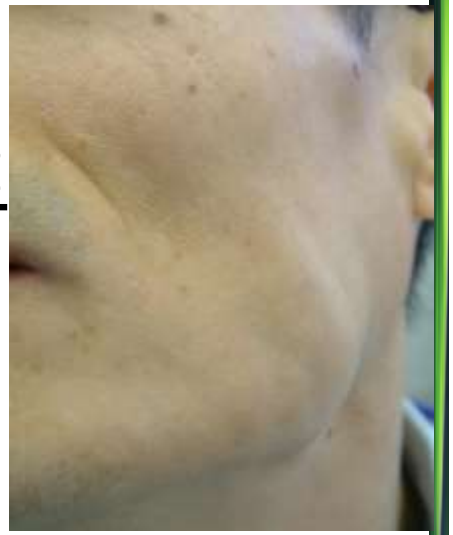
# Vil du unngå dette?



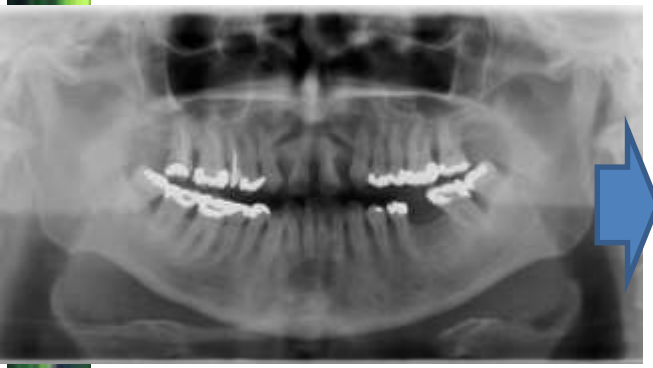
# Vil du unngå dette?

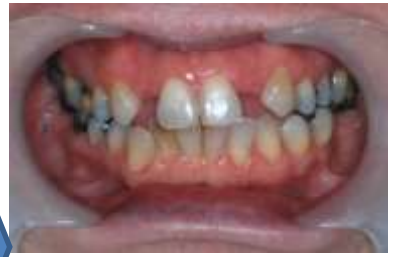
# Da skal du holde deg unna disse to:

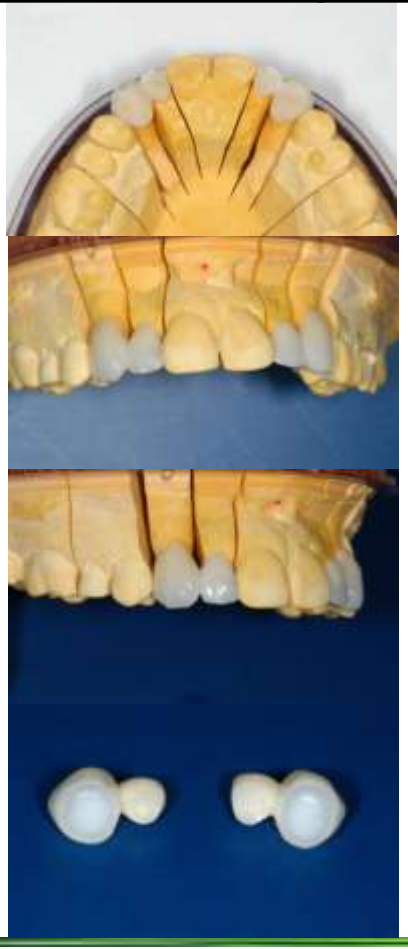


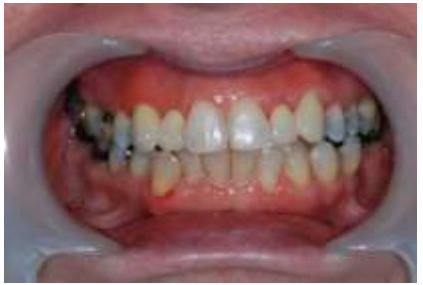


# Pasientkasus #5 : Helkeram e. kjeveortopedi



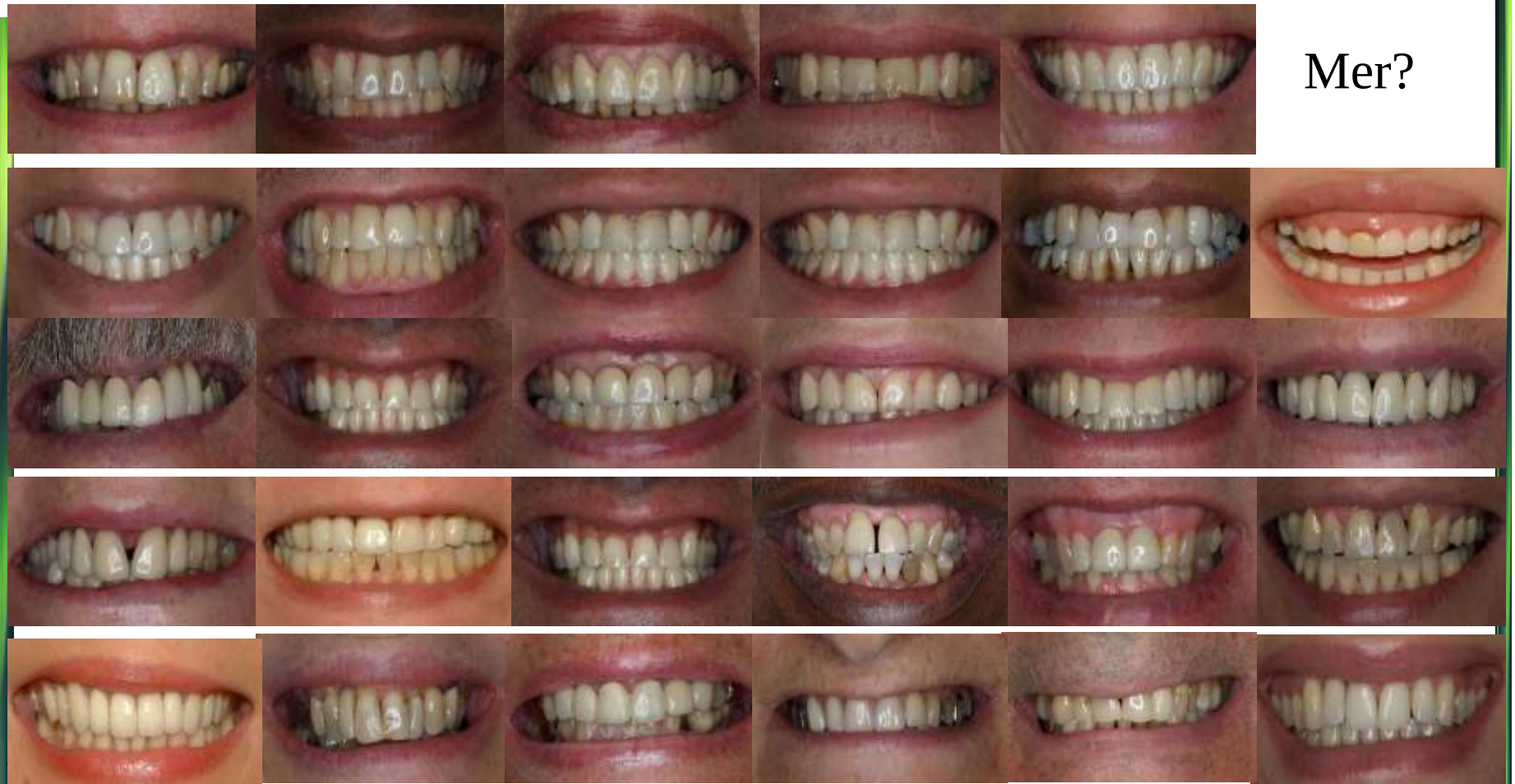






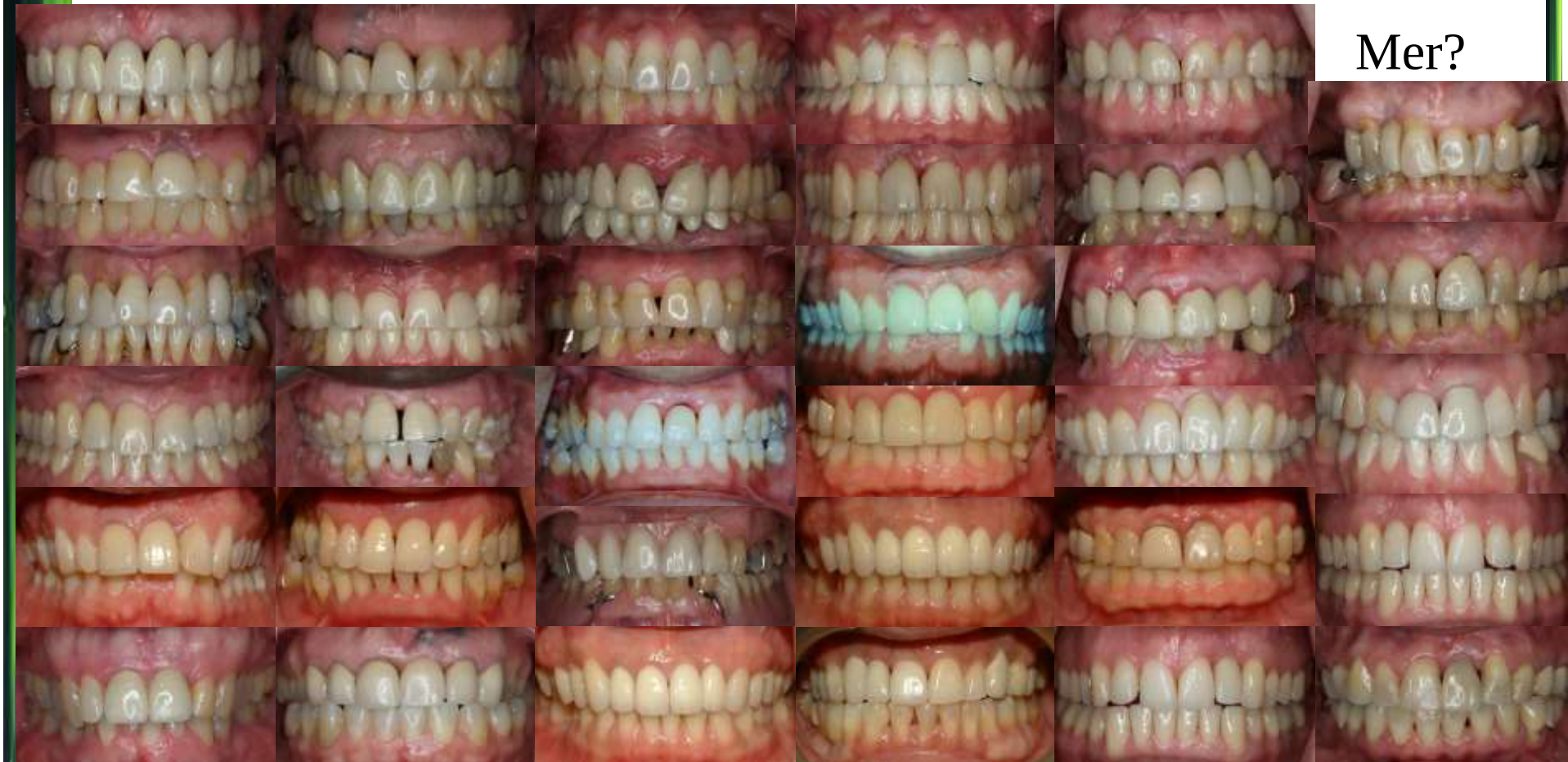
Mo og Olsen-Bergem 2012

# Hvor kritisk skal man være v/ estestikk-vurdering?

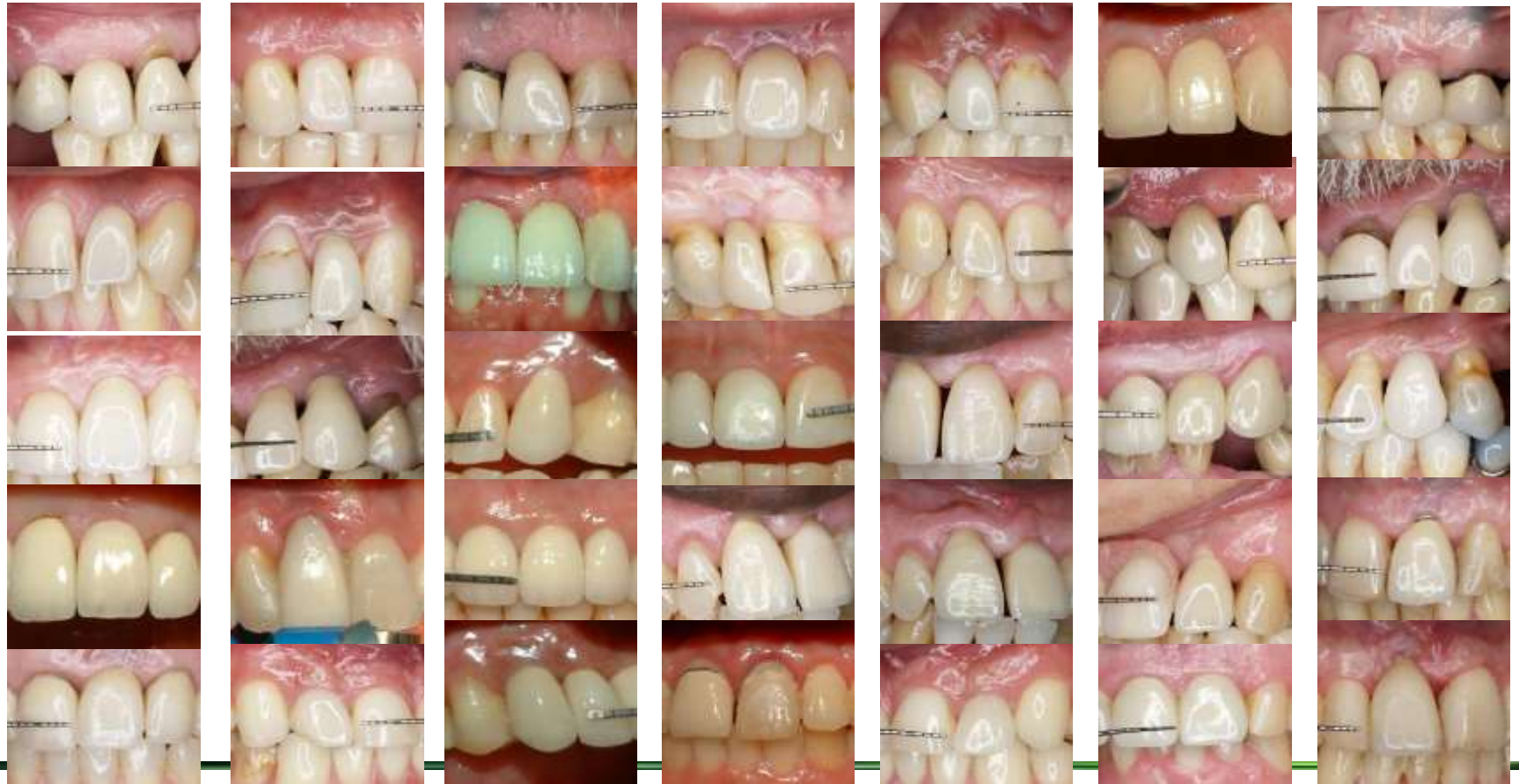


Mer?

# Hvor kritisk skal man være v/ estestikk-vurdering?



# Hvor kritisk skal man være v/ estestikk-vurdering?



# Zirconia til fresing utviser stor variasjon!

| | | % |
|---|---|---|
| **TZP*** | $ZrO_2$ / $Y_2O_3$ | 95 / 5 |
| **TZP-A** | $ZrO_2$ / $Y_2O_3$ / $Al_2O_3$ | ~95 / ~5 / 0.25 |
| **FSZ** | $ZrO_2$ / $Y_2O_3$ | 90 / 10 |
| **PSZ** | $ZrO_2$ / MgO | 96.5 / 3.5 |
| **ATZ** | $ZrO_2$ / $Al_2O_3$ / $Y_2O_3$ | 76 / 20 / 4 |

TZP=(tetragonal zirconia polycrystals)

FSZ= Fully stabilized zirconia

PSZ= Partially stabilized zirconia

ATZ= Alumina toughened zirconia

**Gir stor variasjon mht:**

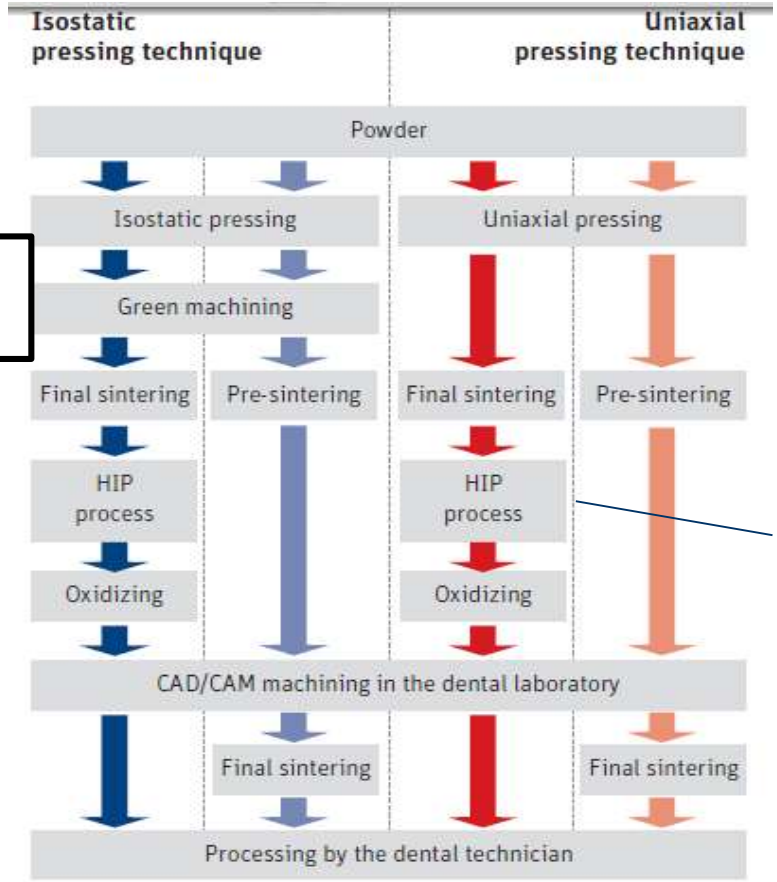
**Frakturmotstand** **Hardhet** **Kornstørrelse** **Tensjonstyrke**
**Elastisitetmodul** **Opasitet** **Sintringstid**

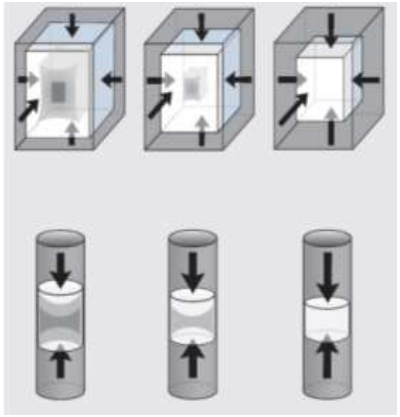
Ingen myndigheter sjekker:

- Keramkompatibilitet
- Optimal kjerne-ytterlag tykkelser
- Egenskaper vs forventet bruk i odontologi

# Zirconia til fresing utviser stor variasjon!

Partielt sintret



Isostatisk kompresjon

Uniaksial kompresjon

(HIP process: hot isostatic post compaction)

Slutt-sintring: ~1350°C (Cercon) -1500°C (Lava) -1530°C (Vita)

# Zirconia substrater for fresing måles ulikt!









3 punkt 4 punkt biaksial bøyetest

# CAM fabrikerte keram-restaureringer –vil vi oppleve problemer i fremtiden?

Proc Inst Mech Eng H. 2005 Jul;219(4):233-43.

**Near-surface damage--a persistent problem in crowns obtained by computer-aided design and manufacturing.**

Rekow D, Thompson VP.

College of Dentistry, New York University, New York, NY, USA. edr1@nyu.edu

**Abstract**

Robust dental systems obtained by computer-aided design and manufacture (CAD/CAM) have been introduced and, in parallel, the strength of the ceramic materials used in fabricating dental crowns has improved. Yet all-ceramic crowns suffer from near-surface damage, limiting their clinical success, especially on posterior teeth. Factors directly associated with CAD/CAM fabrication that contribute to the degree of damage include material selection and machining parameters and strategies. However, a number of additional factors also either create new damage modes or exacerbate subcritical damage, potentially leading to catastrophic failure of the crown. Such factors include post-fabrication manipulations in the laboratory or by the clinician, fatigue associated with natural occlusal function, and stress fields created by compliance or distortion within the supporting tooth structure and/or adhesive material holding the crown to the tooth. Any damage reduces the strength of a crown, increasing the probability of catastrophic failure. The challenge is to understand and manage the combination of competing damage initiation sites and mechanisms, limitations imposed by the demand for aesthetics, and biologically related constraints.

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dental materials

Review

**How and when does fabrication damage adversely affect the clinical performance of ceramic restorations?**

*Isabelle Denry**

*The University of Iowa College of Dentistry, Dows Institute for Dental Research and Department of Prosthodontics, Iowa City, IA, USA*

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ABSTRACT

Objectives. As compared to factory-processed ceramic parts, one unique trait of all-ceramic dental restorations is that they are custom-fabricated, which implies a greater susceptibility to fabrication defects. A variety of processing techniques is now available for the custom fabrication of all-ceramic single and multi-unit restorations, these include sintering, heat pressing, slip-casting, hard machining and soft machining, all in combination with a fina

# Vitenskapelig kunnskap og evidensnivå

- Raigrodski AJ, et al. Survival and complications of zirconia-based fixed dental prostheses: a systematic review. J Prosthet Dent 2012;107:170-7.
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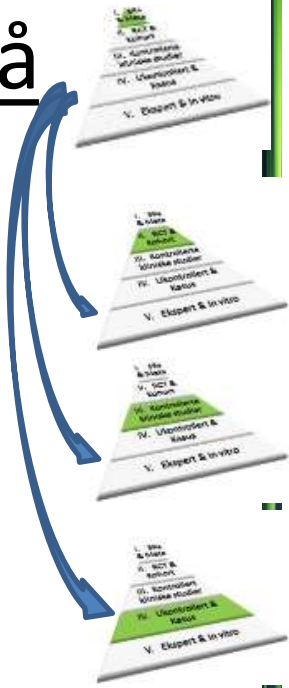
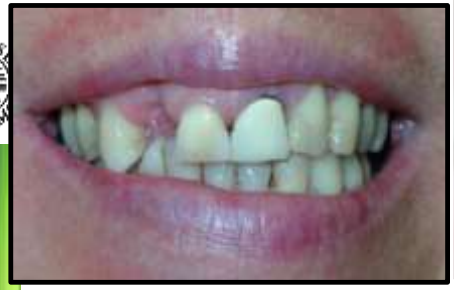
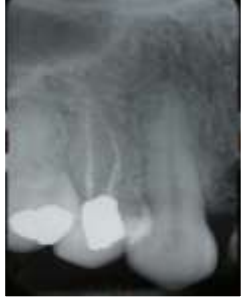
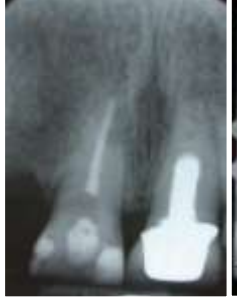
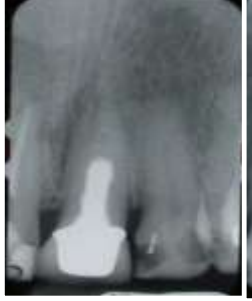
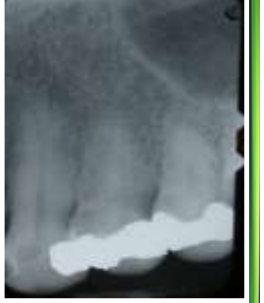
- Schley JS, et al. Survival probability of zirconia-based fixed dental prostheses up to 5 yr: a systematic review of the literature. Eur J Oral Sci 2010;118:443-50.
- Heintze SD, Rousson V. Survival of zirconia- and metal-supported fixed dental prostheses: a systematic review. Int J Prosthodont 2010 ;23:493-502.
- Al-Amleh B, et al. Clinical trials in zirconia: a systematic review. J Oral Rehabil 2010;37:641-52.

industry

industry





Under forutsening av at nabotennene ikke er intakte,:

A. Ja, alltid best med hensyn til forutsigbarhet og til å imøtekomme pasientforventinger

B. Ja, som regel best med hensyn  til …..

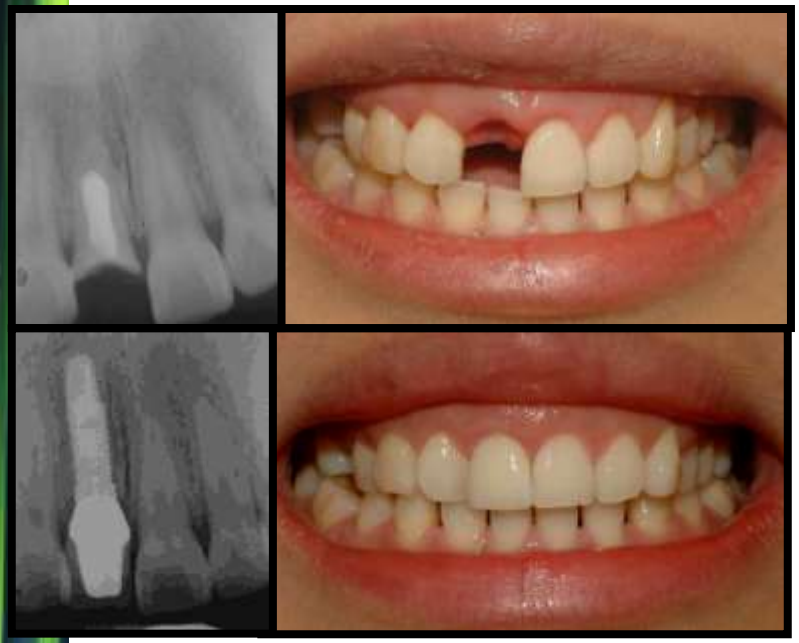
C. Det er likeverdig med hensyn til …..

D. Nei, bro er som regel best med hensyn til …..

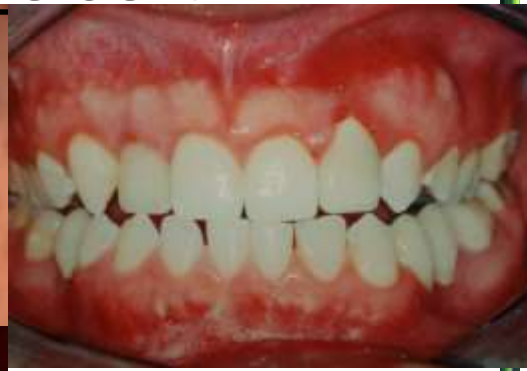
E. Nei, bro alltid best med hensyn til …..

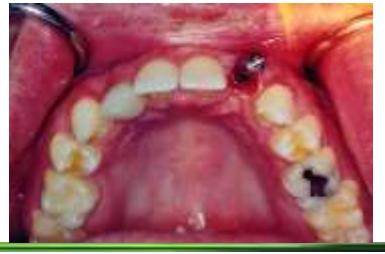
# 6. SINGELTANNSLUKA I FRONTEN – ER EN IMPLANTATLØSNING ALLTID BEST?

# Ønskelig kontra mulig resultat

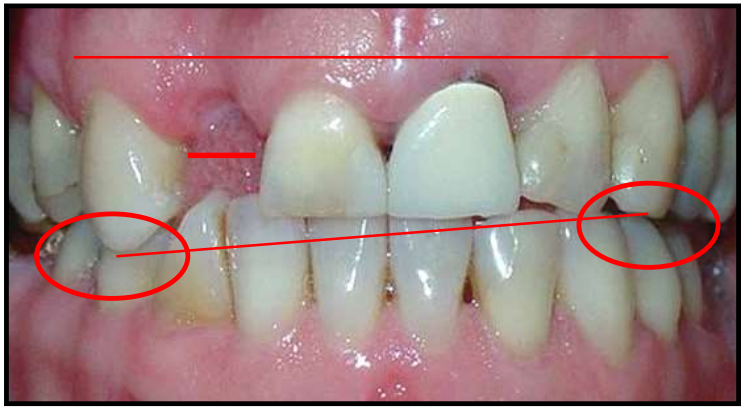


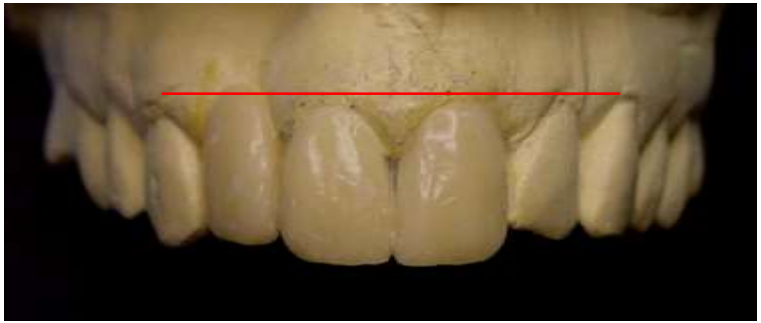
# Krone på singel-implantat kan gi overraskelser!





# Pasientkasus #6: Krone på implantat eller bro?



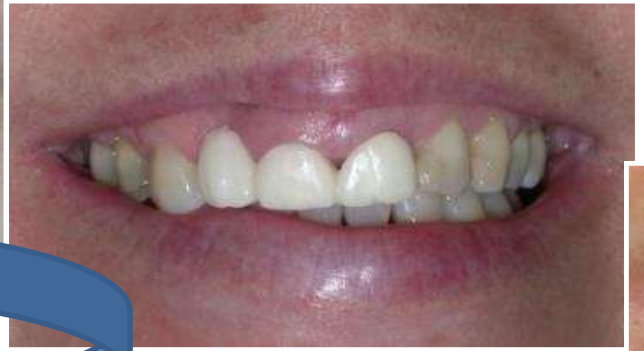


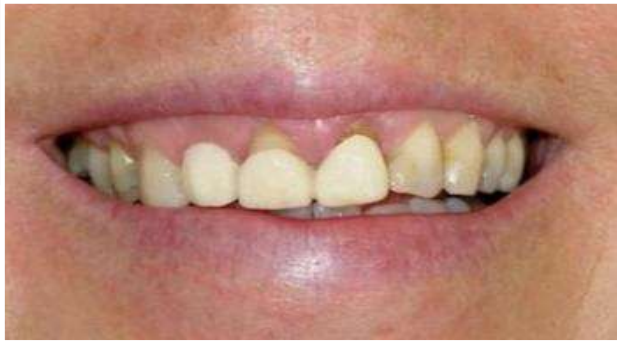
**Behandlingsplan**

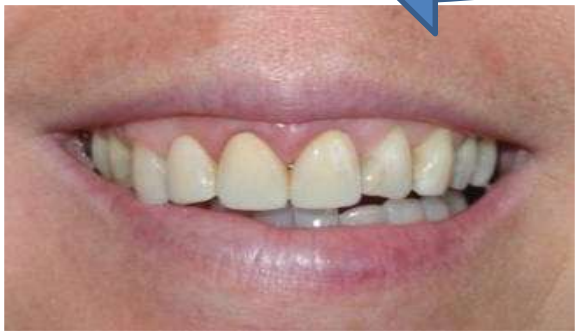
1. Endo 11 og 21 vurdering
2. Preliminær kronepreparering 11 & 21 med temporære kroner
3. Kroneforlengning 11-21 & bløtvevsplastikk 12
4. temporære kroner
5. 3-leddsbro x-11-21

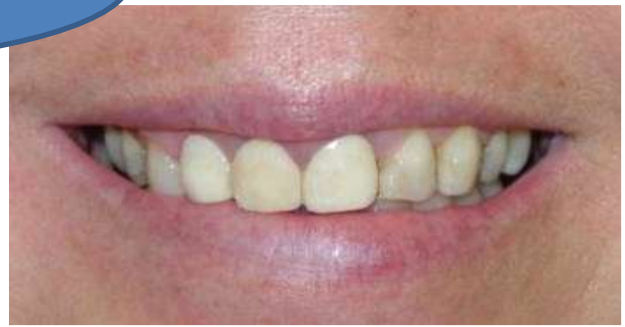
Lin 2007

# Pasientkasus #6: Krone på implantat eller bro?





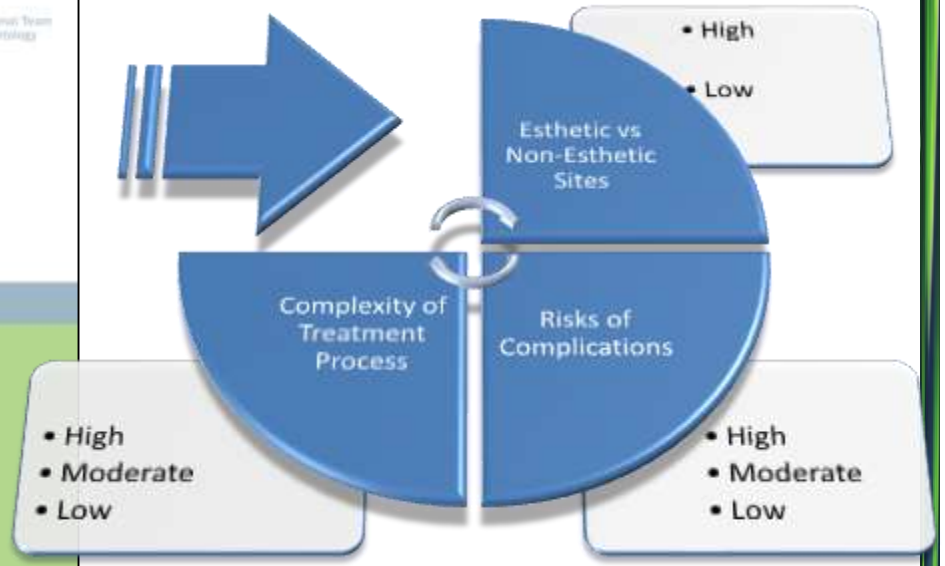




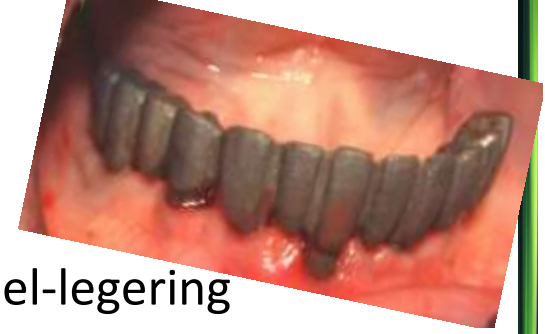
Lin 2007

# Vitenskapelig kunnskap og evidensnivå


## General Determinants




http://www.iti.org



Under forutsetning av ingen mistanke om allergi er

A. Høy-edel-legeringer er langt å foretrekke fremfor lav-edel-legering

B. Høy-edel-legeringer er noe bedre enn lav-edel-legering

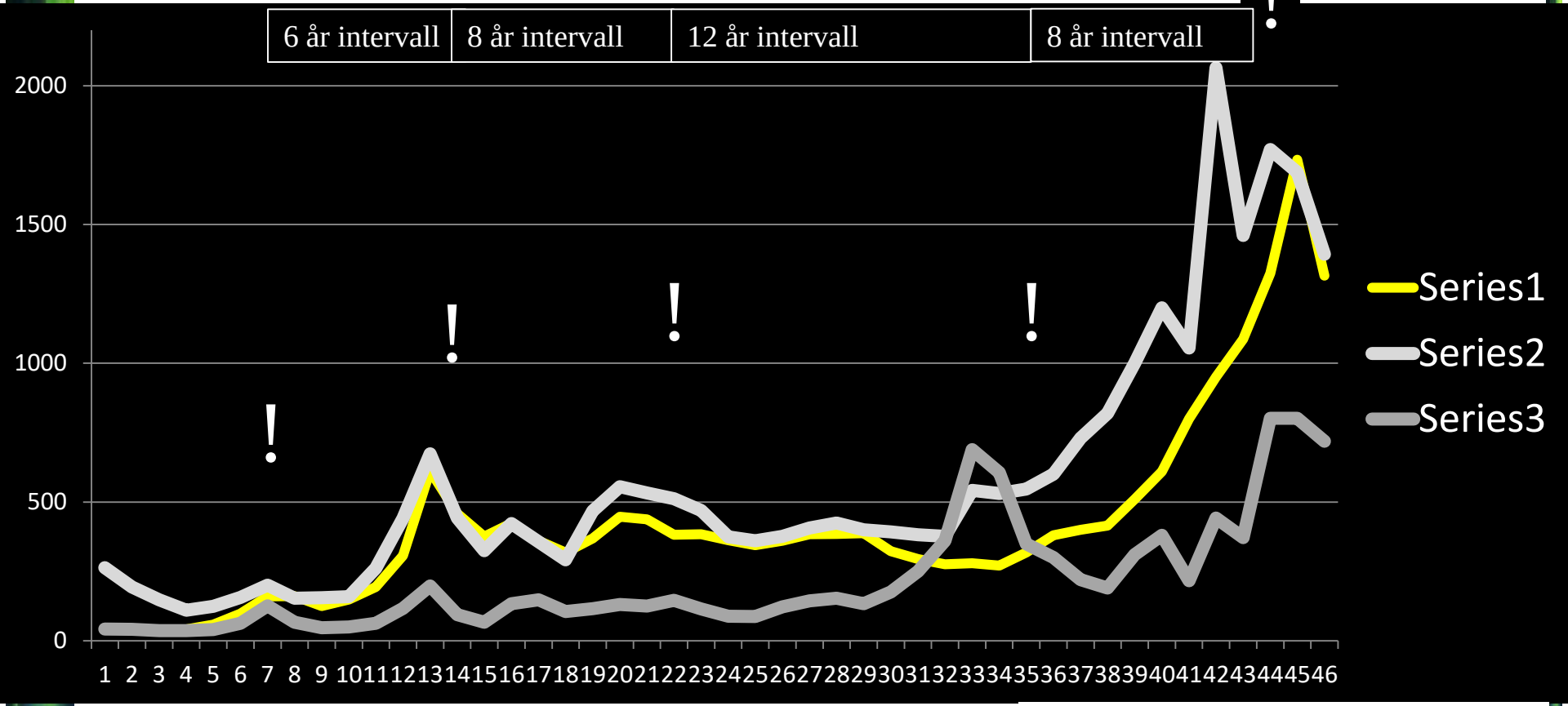
C. Lav-edel-legering og høy-edel-legering er like bra, forskjellen ligger i prisen

D. Lav-edel-legeringer er  noe bedre enn høy-edel-legering

E. Lav-edel-legeringer er langt å foretrekke fremfor høy-edel-legering

# 7. METALL-KERAM-BROEN TIL SVIGERMOR – ER VALGET AV LAV-EDEL-LEGERINGEN LUMPENT?

# $ -pris edellegeringer, 2013




http://www.goldmastersusa.com

# Legeringer til metall-keram-kroner I 2013



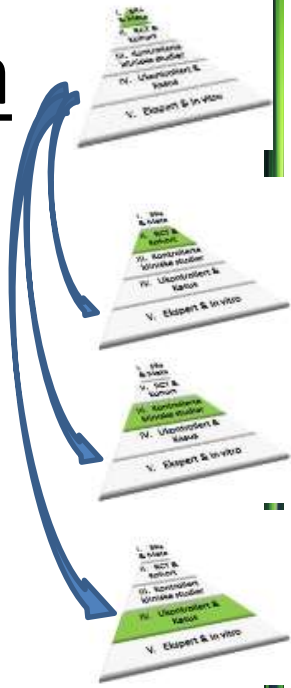



Au-Pt-Pd
Au-Pd-Pt
Au-Pt
Au-Pd
Au-Pd–Ag /In (Hi Ag /Lo Ag)
Pd–Ag (+/-In / +/-Sn)
Pd (- Ag)
Pd-Ag-Au → Pd-Ag/Cu/Ga/In-Au
Pd-Cu
Pd-Ga
Ag-Pd
Cu-Al
Cast Co-Cr
Ni-Cr (+/- Be)
Cast/Electroformed Ti /Ti-alloy
Milled Co-Cr
Milled Ti

1960 1970 1980 1990 2000 2013

# Vitenskapelig kunnskap og evidensnivå

- Ionnaidis ea. (Tenner) J Dent 2010
- Zurdo ea. (Implantat) Clin Oral Impl Res 2009
- U Bern: Aglietta/Brägger/Jung/Lang/Lulic/ Pjetursson/Tan ea. (Implantat & tenner) Clin Oral Impl Res 2004a,b,2005,2007,2008,2009
- Sailer ea. (Implantat) Clin Oral Impl Res 2007
- Goodacre ea. (Implantat & tenner) J Pros Dent 2003a,b



**Ingen av disse systematiske oversiktsartiklene identifiserer holdbarhet som funksjon av legering**

# Vitenskapelig kunnskap og evidensnivå


## Academy of Osseointegration. State of the Science in Implant Dentistry. August 2006

comes in the Partially Edentulous

Hans-Peter Weber, DMD[1]/Cortino Sukotjo, DDS, MSc, PhD[2]

: Implant restoration of the partially edentulous patient has become highly
ic information on the specifics of restorative designs and their influence on t
sparse. The main objective of this systematic review was to determine what s
egarding the influence of prosthodontic design features on the long-term outc
(implant success and survival, prosthesis success and survival) in the par
**Materials and Methods:** Four questions of primary interest regarding impla
options were selected by the 2 reviewers: abutment type, retention type (c
d), support type (implant support alone versus combined implant-tooth suppo
rative material. Inclusion and exclusion criteria were formulated and applied t
he list of titles was primarily based on a PubMed-type search provided by the
Implant Dentistry workshop leadership. It was supplemented by a hand searc
the Countway Library of the Harvard Medical School and of a personal colle

cemented versus screw-retained restorations. Little to no usable information was available on restorative materials and their influence on the outcome.

Most of the studies were conducted in an institutional environment, such as university dental schools.

SECTION 5

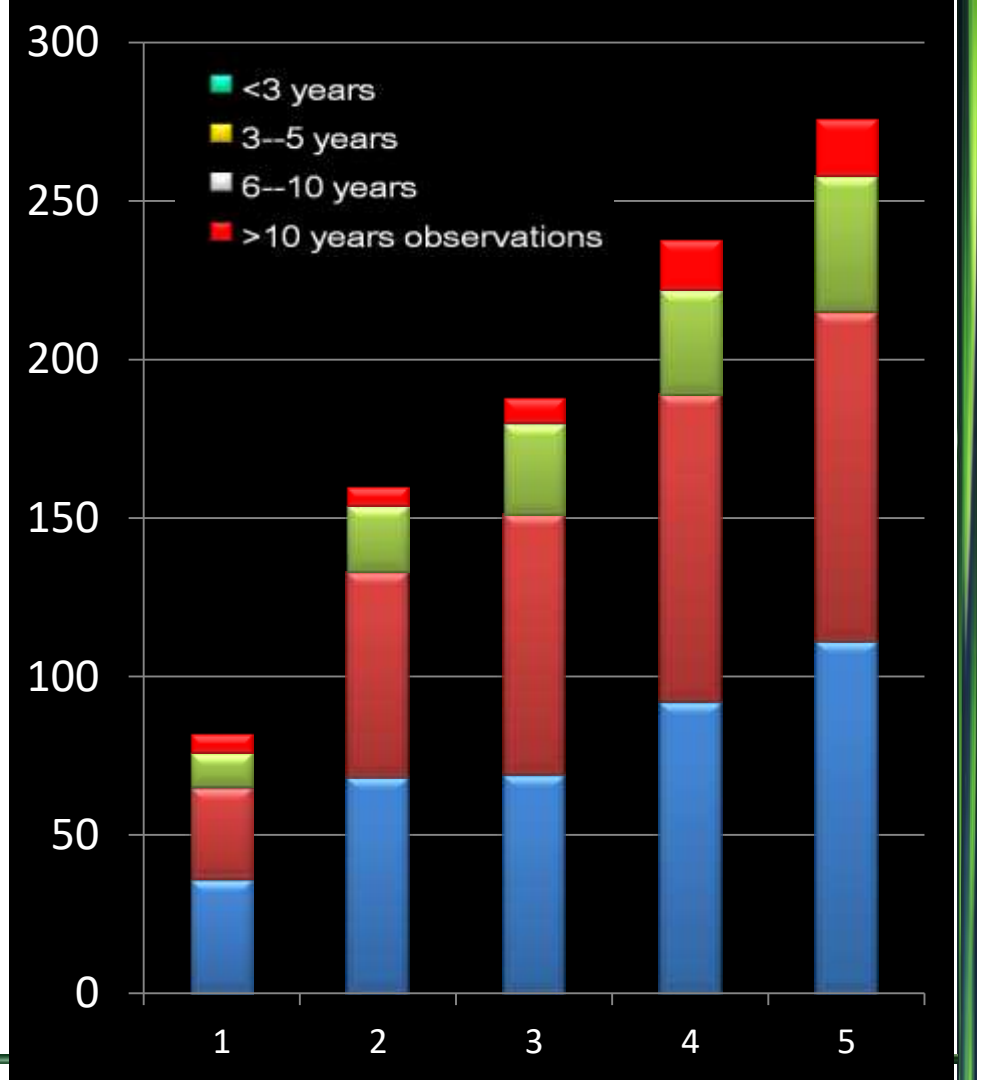
## Does the Type of Implant Prosthesis Affect Outcomes for the Completely Edentulous Arch?

S. Ross Bryant, DDS, MSc, PhD[1]/
David MacDonald-Jankowski, BDS, LLB, MSc, FDSRCPS(UK), DDRRCR[2]/Kwonsik Kim, DMD, MS, Ph

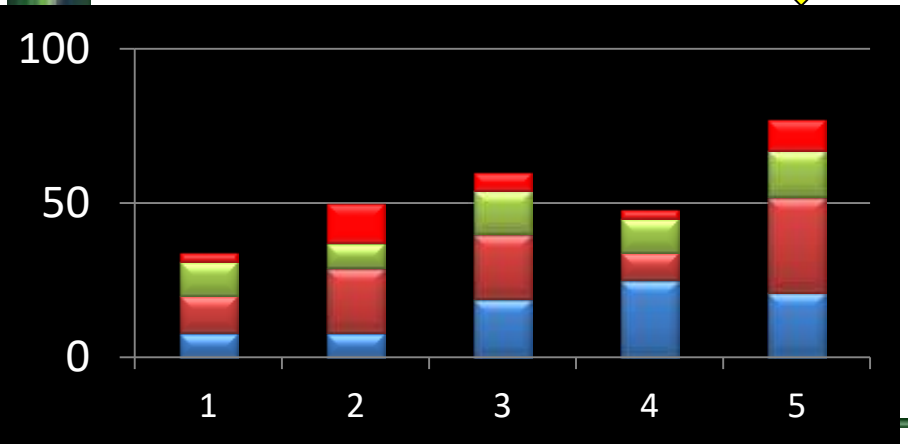
**Purpose:** *A systematic review, including meta-analysis, was conducted to answer the question "Does the type of implant prosthesis affect outcomes for the completely edentulous arch?" The current paper was to assess the impact of fixed or removable prosthesis type on implant survival and success outcomes.* **Materials and Methods:** *Pertinent literature was identified through December 31, 2005 using a PubMed search strategy and hand-searching of relevant journals, a personal library, and reference lists from included studies. Inclusion and exclusion criteria were applied to the titles and abstracts and subsequently to the full text of included references. The 72 included studies reported oral implant survival or success, crestal bone levels or loss, and/or prosthesis success or maintenance differentiated by arch and by prosthesis type (fixed or removable, splinted or nonsplinted) established either in 1-year*

between fixed and removable prosthesis types in edentulous arches. The possible effects of other variations in prosthetic type (such as splinting, rotational characteristics, prosthetic materials, and the number of implants) as well as the effect on crestal bone loss and prosthesis success and maintenance outcomes, are not addressed in detail in this paper. As most commonly reported in implant outcome studies,

# Kliniske studier bro på implantater: n=738/3005




# Kliniske studier bro på tenner: n=228 /502



FDPs Retained by implants

Clinical study reports (n = 738 )

Observations =>10 years (n = 53)

Alloy described (n = 30 )

Observation period < 10 years (n = 685)

FDP alloy not described (n = 23)

Observation period < 10 years (n = 190)

FDP alloy not described (n = 18)

FDPs Retained by teeth

Clinical study reports (n = 228)

Observations =>10 years (n = 38)

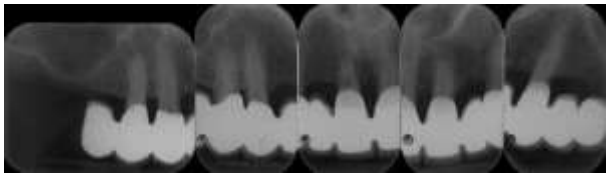
Alloy described (n = 20)

**AgPd: Albacast/PalliagM:** Attard/Bryant/Wyatt /Zarb 1998-04 a,b,c,d,e,f,g,h,I,j,k l

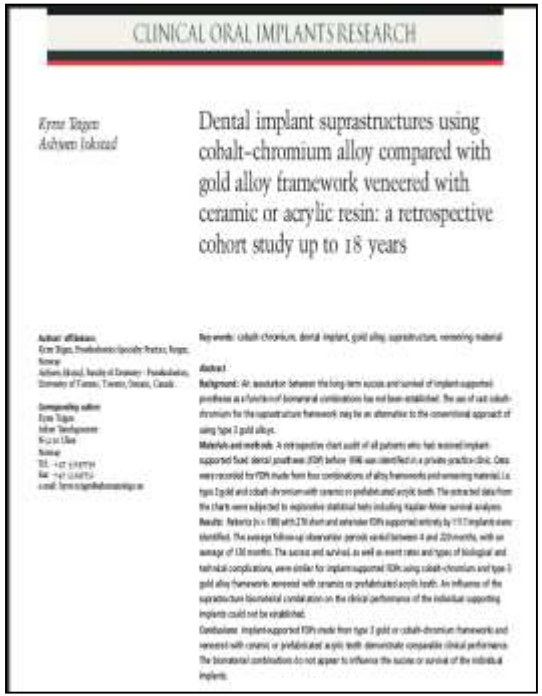
**Type3Au:** Lindquist /Carlsson /Jemt /Ekelund 1994-03 a,b,c,d,e,f
Åstrand ea. 2008
**"Gold alloy":** Gunne ea 1999
**"Gold or Co-Cr"**: Brånemark /Adell /Jemt/Ivanoff 1977-2000 a,b,c,d
**Cp1/Cp2 Ti & "cast gold "**: Örtorp & Jemt 2006-09 a,b,c,d,
"**precious alloy" / "cast gold"**: Eliasson ea 2006
**"precious/semi-precious alloy** : Lekholm ea 1999

**Type4Au: Degudent U**: DeBacker ea, 2006-08a,b,c,d,e,f
**Type3Au: KAR Gamma:** Valderhaug ea 1980-97a,b,c,d
**Type 3Au: Sjöding:** Karlsson ea 1989
**Au-Pd/ Ni-Cr (several)**: Anderson / Vet.Adm. 1993
**"Co-Cr":** Öwall ea, 1991
**"Gold"**: Lindhe & Nyman 1984
Glantz ea 1993
Yi ea 1996&97
Hämmerle ea 2000
**"High noble":** Walton 1997
**"Precious alloy":** Sundh & Ödman 1997

# Vitenskapelig kunnskap og evidensnivå



Kourkouta et al. Br Dent . 2007



CLINICAL ORAL IMPLANTS RESEARCH

Kyrre Ydgren
Ashwini Jokstad

Dental implant suprastructures using cobalt-chromium alloy compared with gold alloy framework veneered with ceramic or acrylic resin: a retrospective cohort study up to 18 years

Clin Oral Implants Res
2012;23(7):853-60

- Svanborg P, et al. A 5-year retrospective study of cobalt-chromium-based fixed dental prostheses. Int J Prosthodont 2013; 26:343-9

- Hjalmarsson L. On cobalt-chrome frameworks in implant dentistry. Swed Dent J Suppl 2009;(201):3-83

Under forutsetning av at tannsubstanstap er overveiende forårsaket av friksjon og ikke av korrosjon:

A. Helkeram er langt bedre å bruke enn kompositt plast

B. Helkeram og kompositt plast er nesten likeverdig, men helkeram er noe bedre

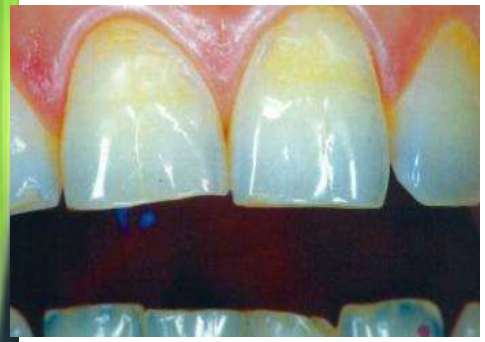
C. Helkeram og kompositt plast er likeverdig så pasienten får bestemme

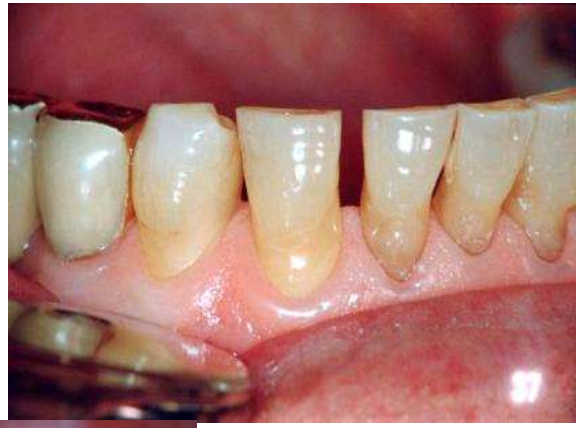
D. Kompositt plast og helkeram er nesten likeverdig, men MK er noe bedre

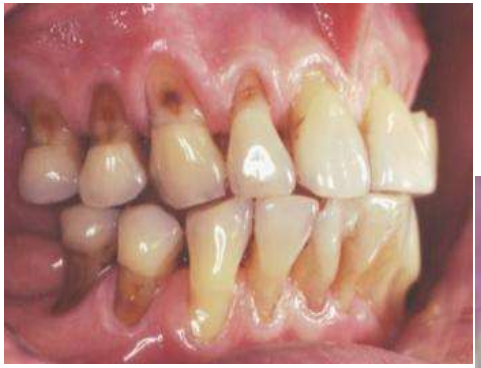
E. Kompositt plast er langt bedre å bruke enn helkeram

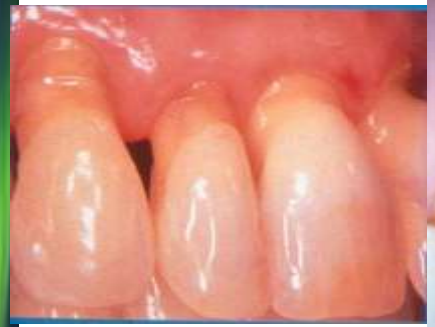
# 8. SLITASJETANNSETTET – ER PLAST BILLIG OG BRA ? …ELLER BARE BILLIG?

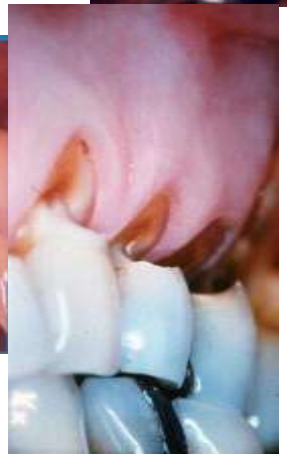
# Hva mener vi med «tannslitasje»

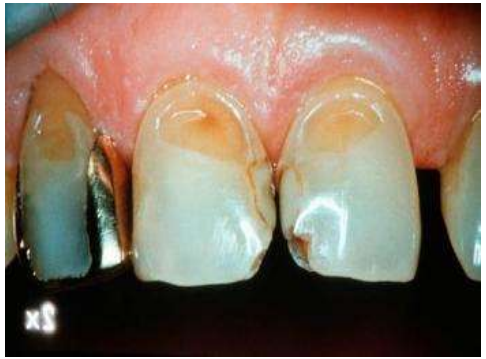


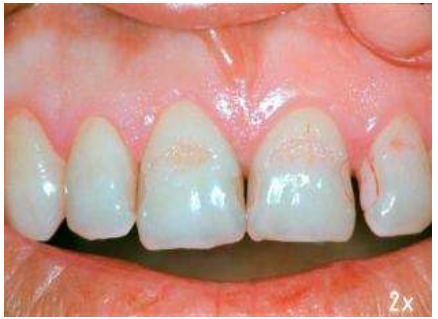












# «Tannslitasje» (eng.) «Tooth surface lesions (TSL)" – opprinnelse:

Fra 1778:

*Abrasion: Loss by wear of dental tissue caused by friction of a foreign substance ( dentifrice, toothbrush, objects)

*Erosion: Progressive loss of hard dental tissue by chemical processes not involving bacterial action

*Attrition: Loss by wear of surface of tooth or restoration caused by tooth to tooth contact during mastication or parafunction

Fra 1991

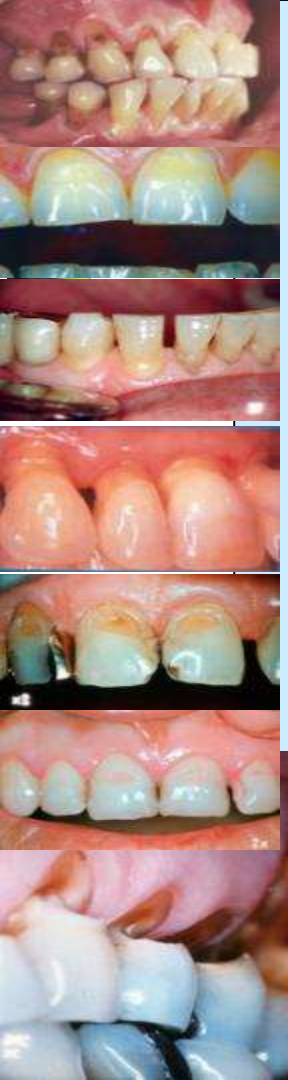
**Abfraction: Loss of tooth surface at the cervical areas of teeth believed to be caused by tensile and compressive forces during tooth flexure"

* Hunter J. The natural history of human teeth. London: J. Johnson; 1778:98-100
** Grippo JO. J Esthet Dent 1991.

# Vi bør anvende korrekt terminologi fra tribologi

American Society for Testing & Materials Committee on Standards (ASTM). Erosion:

*"The progressive loss of a material from a solid surface due to mechanical interaction between that surface and a fluid, a multicomponent fluid, impinging liquid or solid particles"*



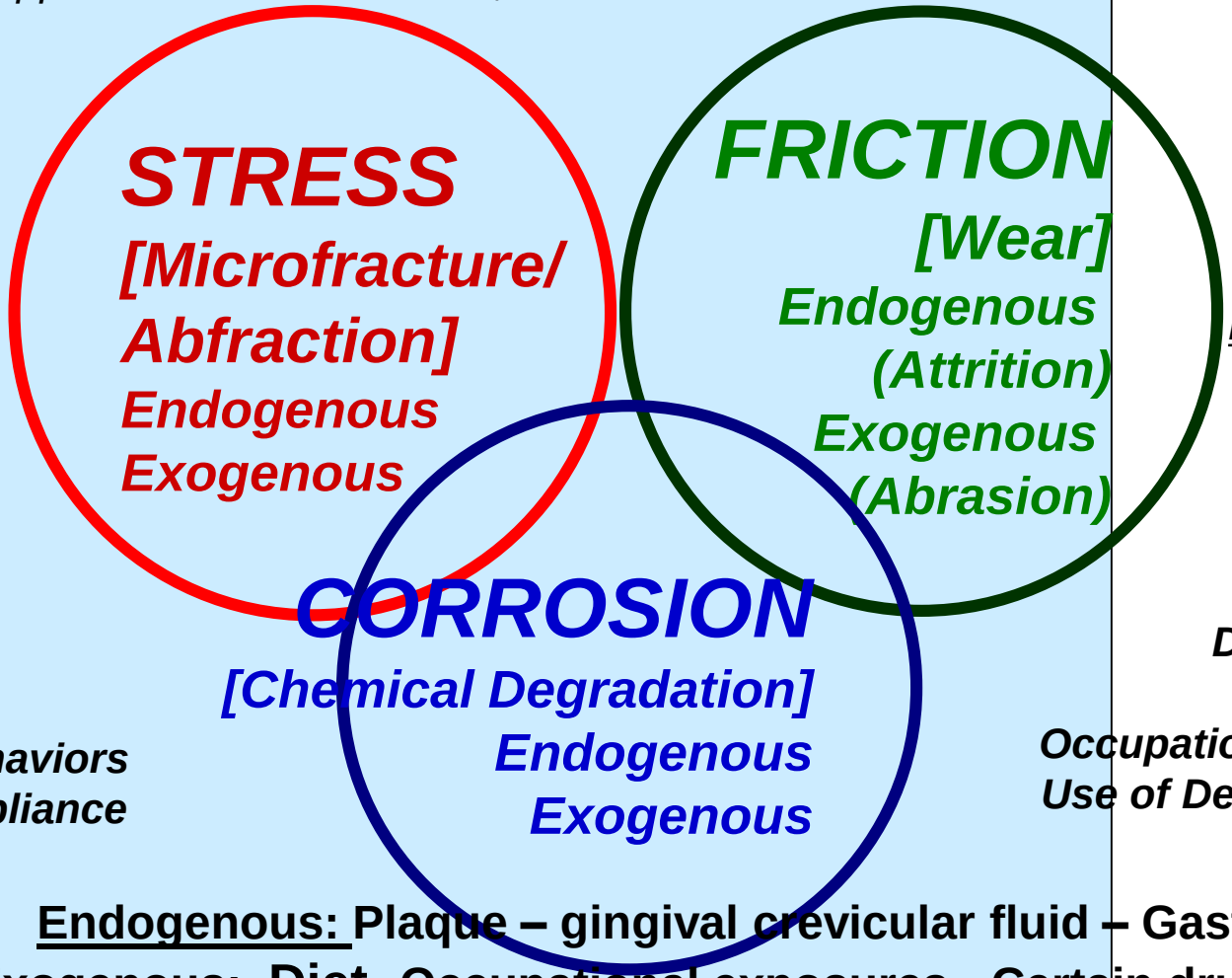
*Grippo et al. JADA 2004 135; 1109*

**STRESS**
***[Microfracture/ Abfraction]***
***Endogenous***
***Exogenous***

**FRICTION**
***[Wear]***
***Endogenous (Attrition)***
***Exogenous (Abrasion)***

**CORROSION**
***[Chemical Degradation]***
***Endogenous***
***Exogenous***

Grippo et al. JADA 2004 135; 1109




**Endogenous**
Parafunction
Occlusion
Deglutition

**Exogenous**
Mastication
Habits
Occupational behaviors
Use of Dental appliance

**Endogenous**
Parafunction
Deglutition

**Exogenous**
Mastication
Dental Hygiene
Habits
Occupational behaviors
Use of Dental appliance

**Endogenous:** Plaque – gingival crevicular fluid – Gastric juice

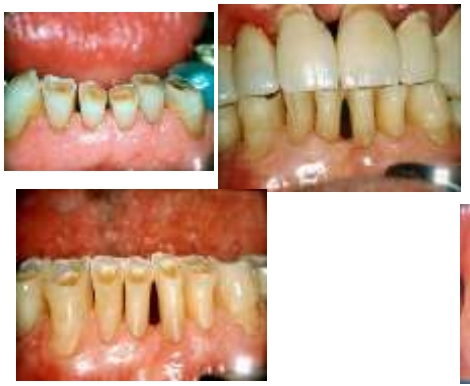
**Exogenous:** Diet -Occupational exposures - Certain drugs/alcolhol

# Tribologi –konsept bør anvendes i odontologi

## Overveiende aspekter

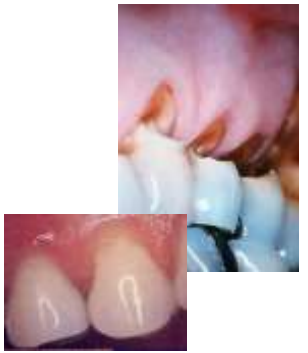
Korrosjon

Friksjon

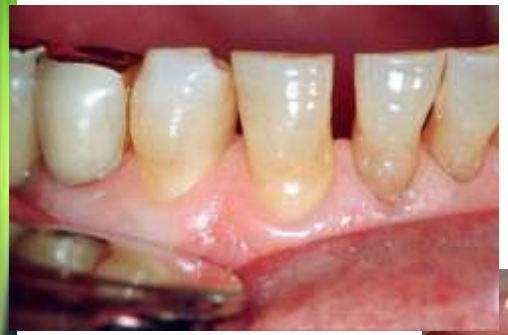
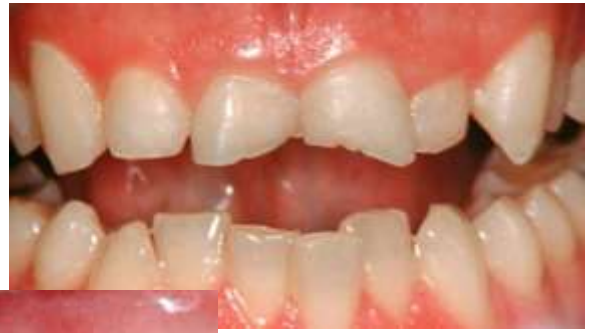


«Ekstern» årsak (?)

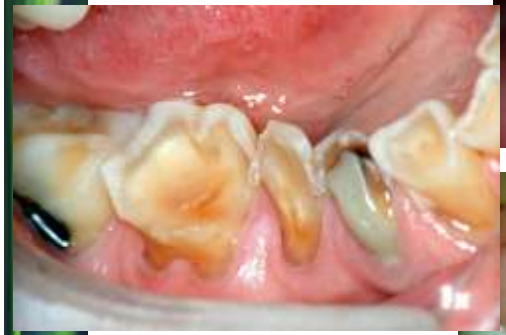
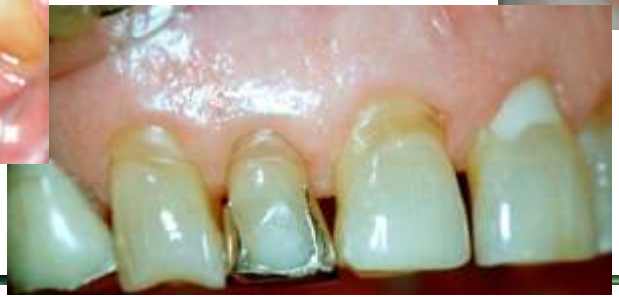
Stress



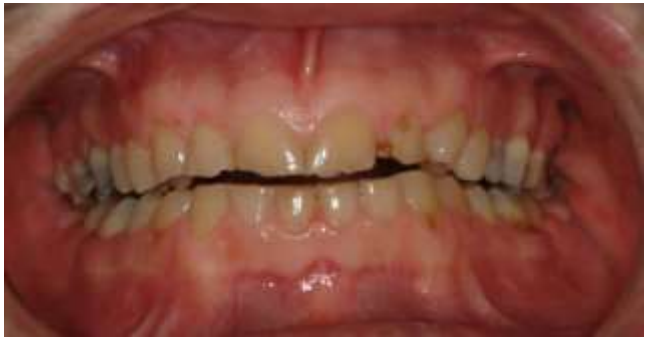
# Kombinasjoner av stress, friksjon og korrosjon

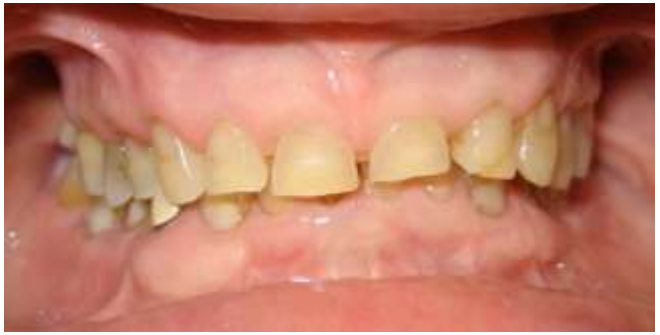



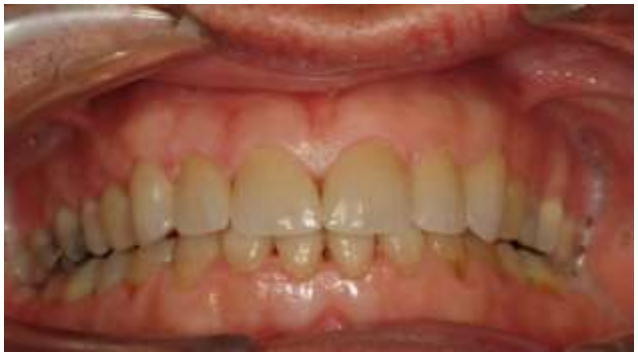


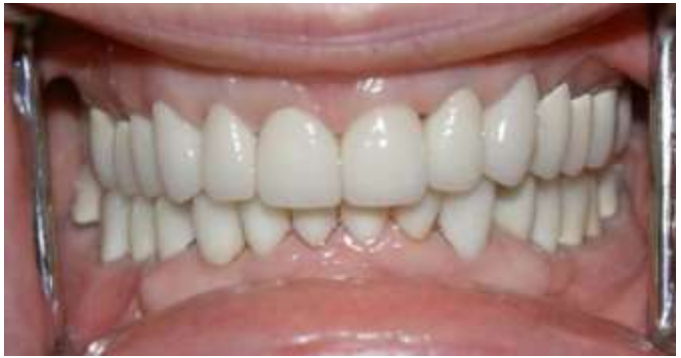





# Pasientkasus #8: (Friksjon)-slitasje - keramlaminater



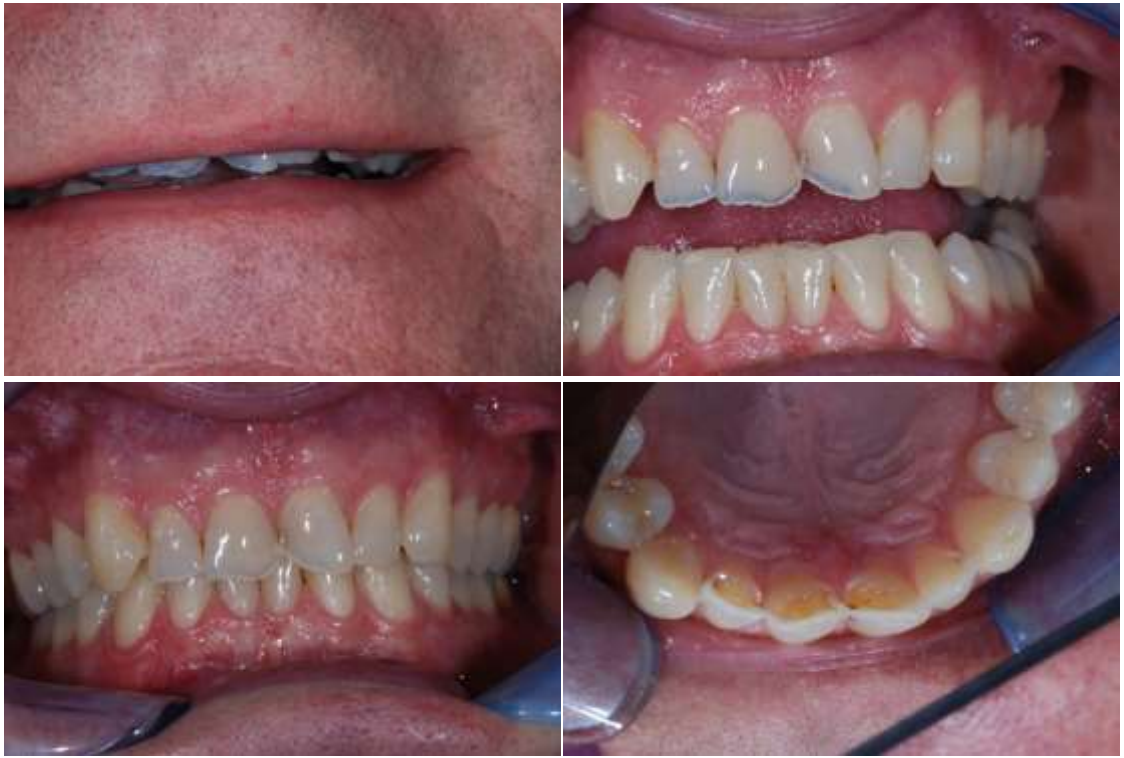


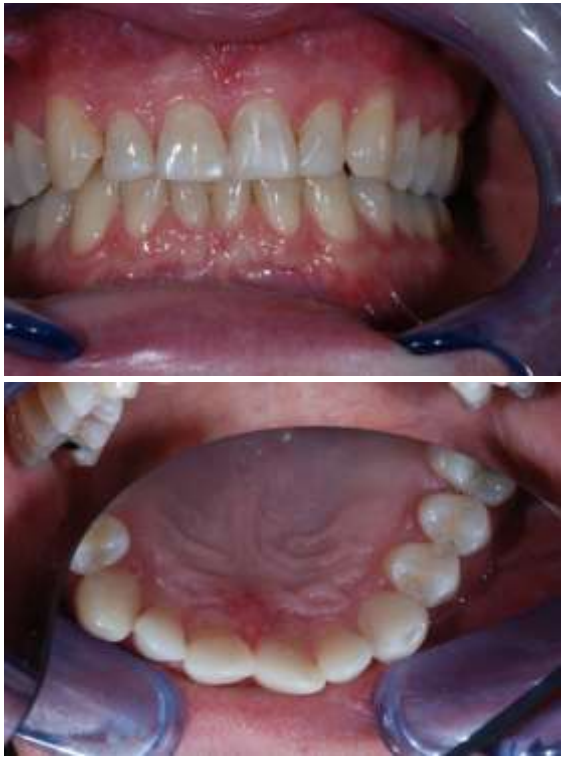




Skandinavisk løsning kontra Nord-Amerikansk

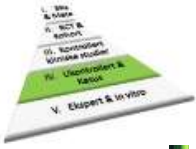
# Pasientkasus #8: (Korrosjon)-slitasje – kompositt plast





Mo og Hjortsjö 2012

# Vitenskapelig kunnskap og evidensnivå



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Med hensyn til behandling av TMD pasienter er en:

A. En myk skinne like effektiv som en hard stabiliserings-skinne

B. En reposisjonerings-skinne bedre enn en stabiliserings-skinne

C. En reposisjonerings-skinne minst lik eeffektiv som stabiliserings-skinne

D. Hard stabiliserings-skinne i underkjeven langt å foretrekke

E. Hard stabiliserings-skinne i overkjeven langt å foretrekke

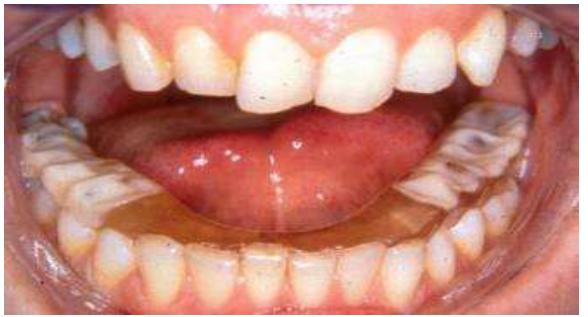
# 9. TMD PASIENTEN – HVORDAN VAR DET MED HARD STABILISERING- ELLER REPOSISJONERINGS-SKINNENE?

# Pasientkasus #9: Bittskinne

## Noen tannleger ser ut til å fortsette å tro at bittet kan forårsake TMD

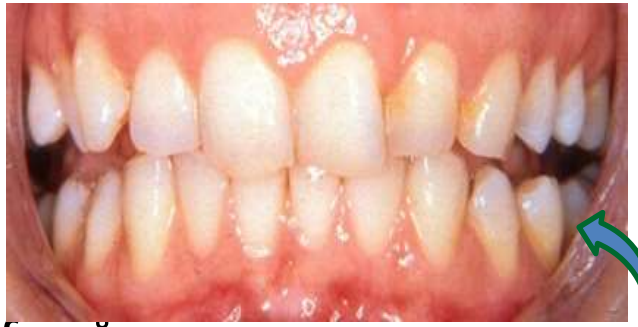
- "Ortopedisk stabilitet" av leddet
- Endret propriosensjon til CNS
- Siden 70-tallet, "disk recapturing" vha anterior displasering-skinne (Farrar, 1972)

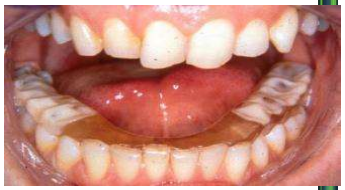
E.g., Summer & Westesson. Mandibular repositioning can be effective in treatment of reducing TMJ disk displacement. Cranio 1997; 15: 107-20.



# Pasientkasus #9: Bittskinne

## Lang-tids bruk av MORA skinne→



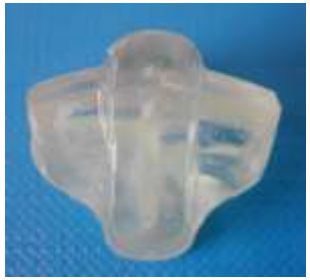


- Skal brukes 24/7
- Anterior reposisjonering av kjeven ordinert for å promotere adaptasjon av retro-discale vev
- Oppfølgende ortodontisk eller protetisk korreksjon?

  Opprinnelig Ja.
  - **Ja:** Moloney ea 1986, Lundh 1997, Summer ea 1997
  - **Nei:** Keeling ea, 1989, Tallents ea 1990, Parker 1993, Orenstein 1993, Okeson 1988
- Literatur motstridende – primært pga uklare / surrogat resultatmål

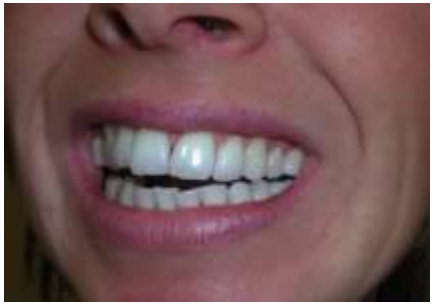
# Pasientkasus #9: Bittskinne

## Lang-tids bruk av NTI-skinne



Sambitt

Venstre laterotrusjon



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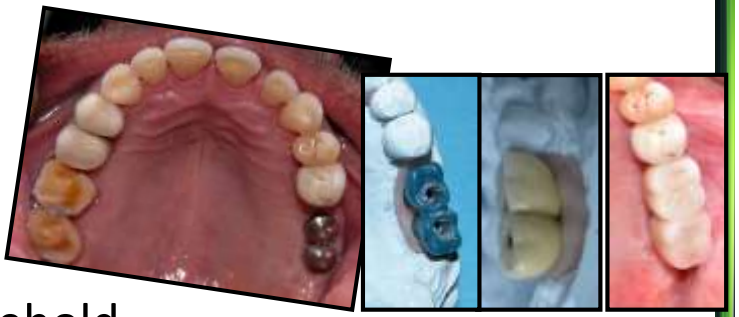


A. Anbefal implantat umiddelbart og uten forbehold

B. Anbefal implantat etter gjennomført periodontitt-behandling

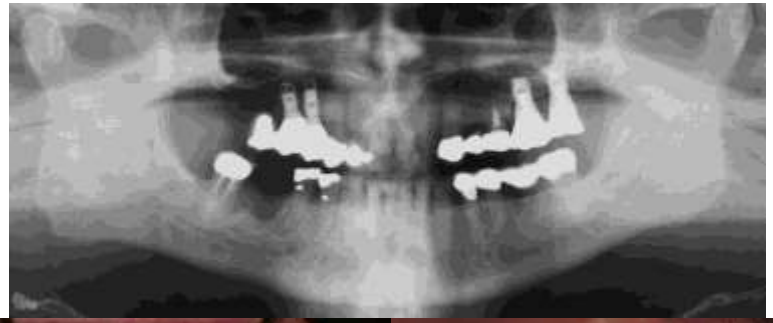
C. Anbefal benoppbygging først og deretter implantater

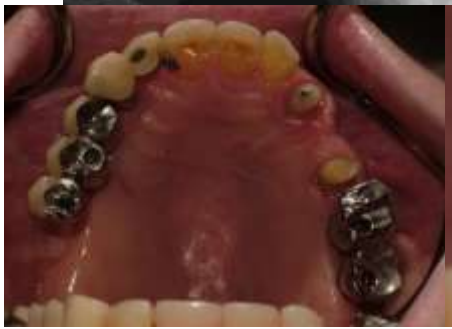
D. Fraråd implantat og anbefal partiell avtakbar protese

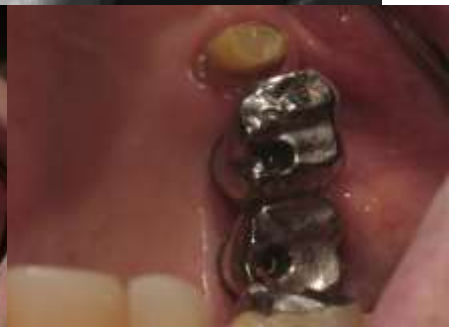
E. Fraråd implantat og ingen tannerstatning

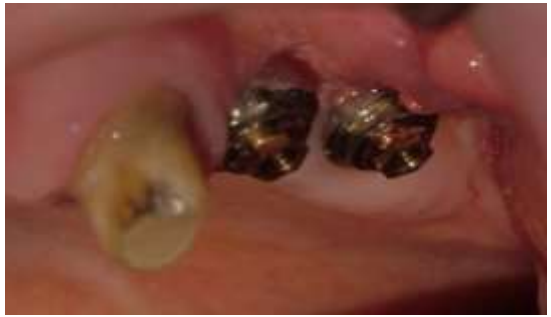
# 10. DEN PERIOAKTIVE RØYKEREN SOM MISTET 17&16 – OG BARE MÅTTE HA IMPLANTATER! (?)

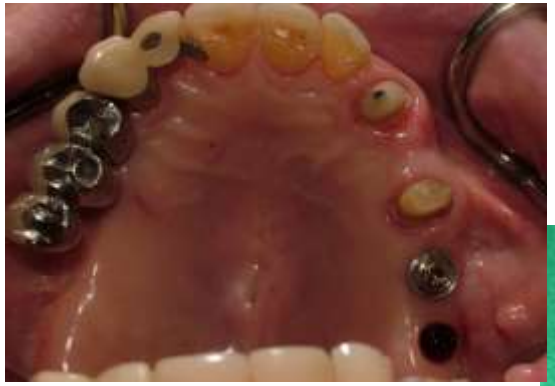
# Pasientkasus #10: Implantat posteriort okj.











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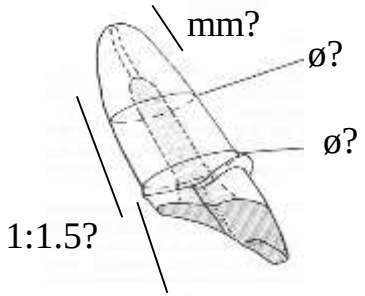
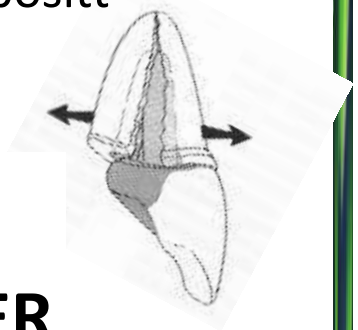



A. At det kan lages et adekvat kronegrep (”ferrule”)
B. At det sementeres en støpt stift-konus
C. At det bondes en tannfarget stift og fremstilles konus i kompositt
D. At det blir igjen minimum 3mm rotfyllingsmasse
E. At stiften ikke blir kortere enn den kliniske kronehøyden



# 11. KOLLUMFRAKTUR – HVILKEN FAKTORER ER VIKTIGST FOR FREMTIDIG KRONERETENSJON OG -PROGNOSE?

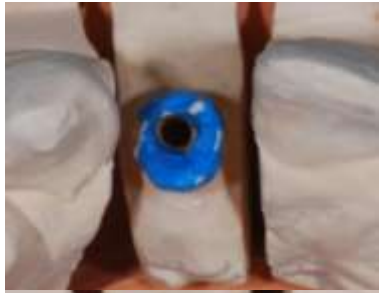
# Behov for stift i rotfylt tann

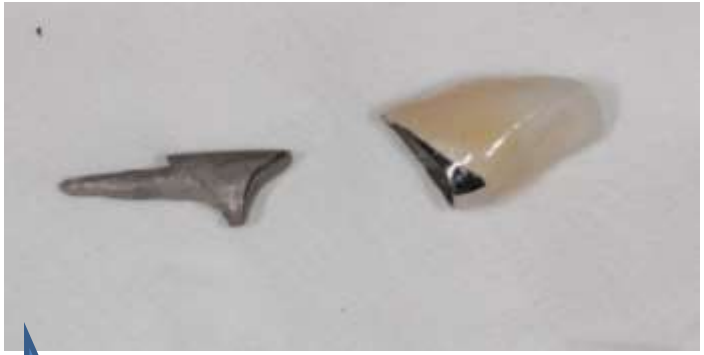
Så lite tannsubstans som overhodet mulig skal fjernes

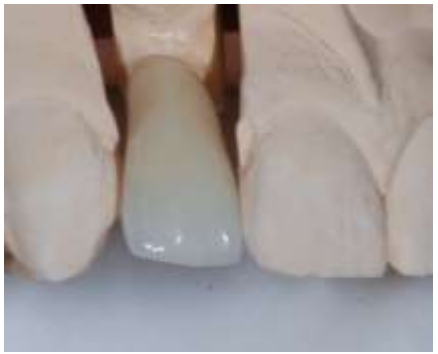
Likevel, 2 motstridende syn gjelder fortsatt:

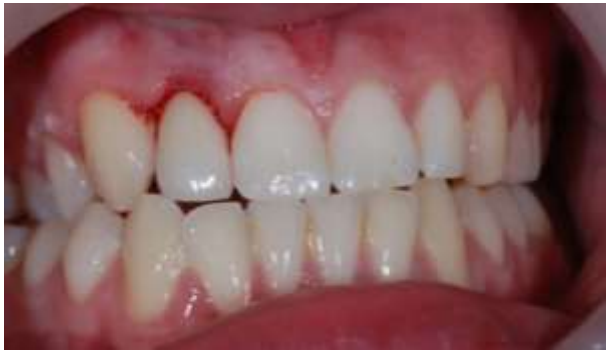
1. Bare når det er behov for retensjon av koronal restaurering (”Nord-Europa”)
2. En rotfylt tann ”forsterket” med en stift har en bedre prognose enn rotfylte tenner uten stift (”Sør-Europa”)

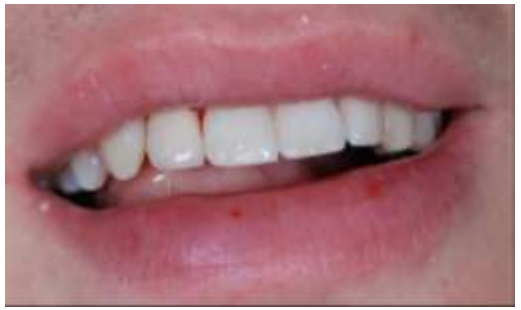
# Pasientkasus #11: Rotstift



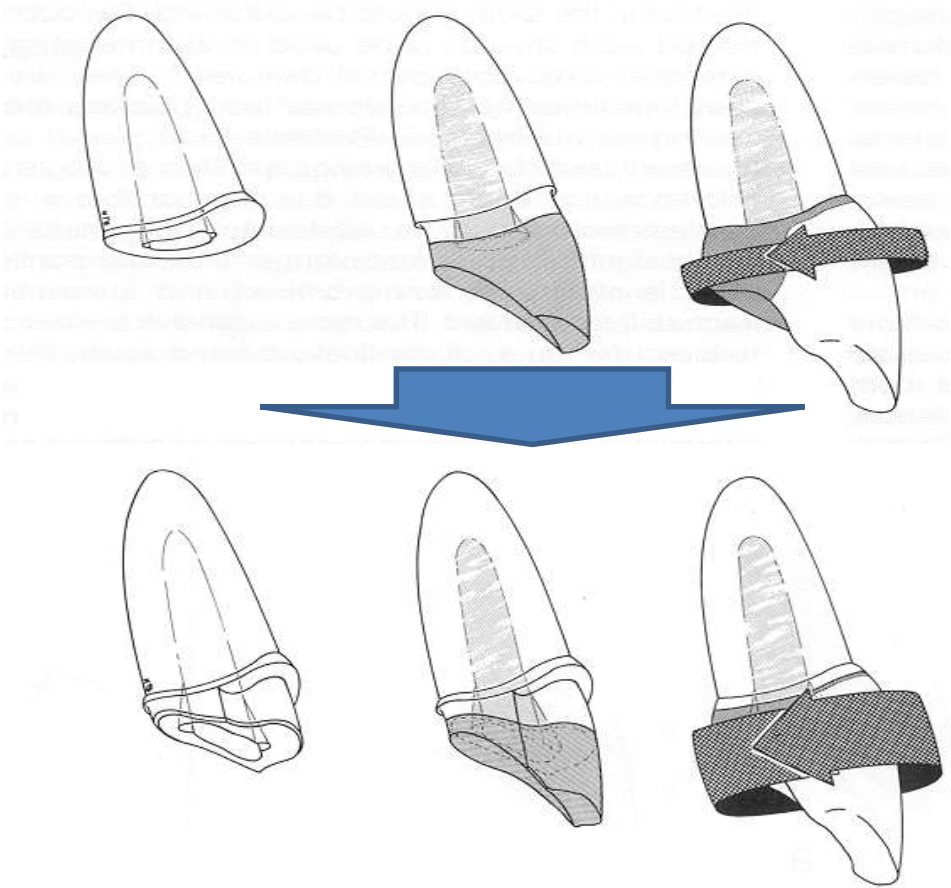








# Viktigst er adekvat kronegrep!



# Vitenskapelig kunnskap og evidensnivå

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- Goracci C, Ferrari M. Current perspectives on post systems: a literature review. Aust Dent J 2011;56 Suppl 1:77-83 **(Intraradikulær resin-adhesjon er dårligere enn mot koronal dentin)**
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Under forutsetning av at det ikke sementeres konvensjonell helkeram og almen aksepterte prepareringsprinsipper:

A. Polymer-sement er bedre enn andre sementer

B. Glass-ionomer-sement er bedre enn andre sementer

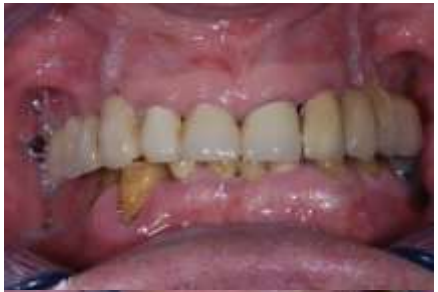
C. Hybrid-sement med overvekt av polymer er bedre enn andre sementer

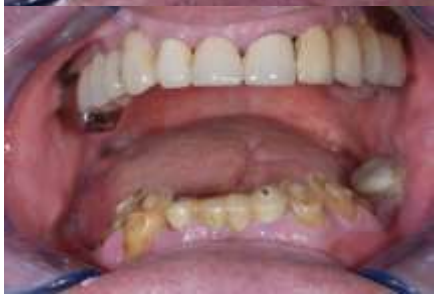
D. Hybrid-sement med overvekt av GIC er bedre enn andre sementer

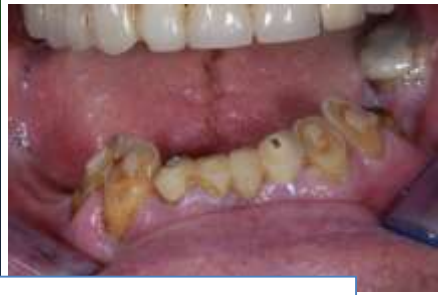
E. Fosfatsement er bedre enn andre sementer

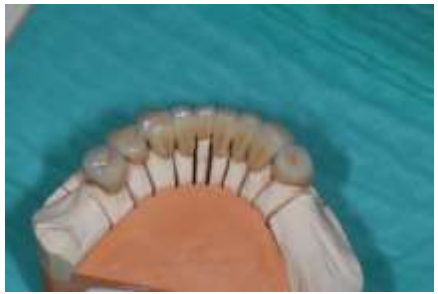
## 12. SINKFOSFATSEMENT ER 100 ÅR GAMMELT MEN PLASTSEMENT ER NYTT –VALGET ER VEL KLART?

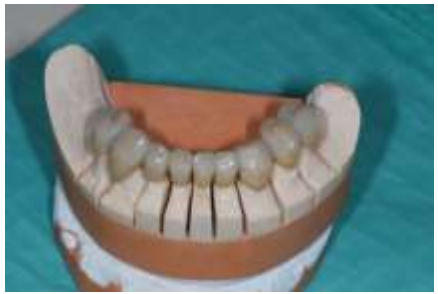
# Pasientkasus #12: Sement til faste proteser

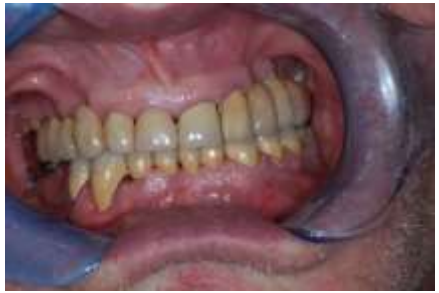


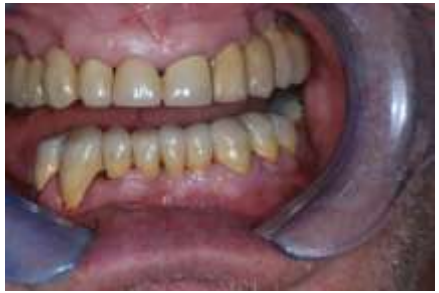












Mo 2012

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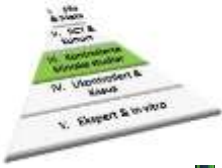



# Vitenskapelig kunnskap og evidensnivå

Praksis-baserte kliniske studier organisert av NIOM Nordic Institute of Dental Materials

Ivar A Mjør (†2017)

| | |
|---|---|
| Amalgam | 10 år |
| Glass-ionomer | 5 år |
| Kompositt plast | 10 år |
| Kronesement | |


0300-5712(95)00076-3

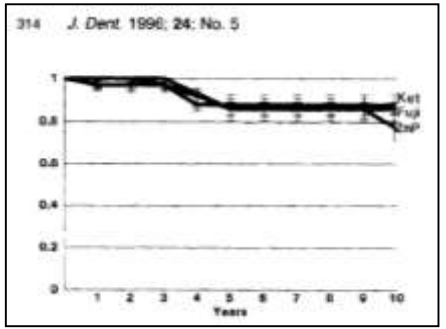
*Journal of Dentistry*, Vol. 24, No. 5, pp. 309–315, 1996

Printed in Great Britain
0300-5712/96 $15.00 + 0.00

ELSEVIER

**Ten years' clinical evaluation of three luting cements**

A. Jokstad and I. A. Mjör*
*Department of Prosthetic Dentistry and Stomatognathic Physiology, University of Oslo, Oslo, Norway, and NIOM, Scandinavian Institute of Dental Materials, Haslum, Norway*



# Vitenskapelig kunnskap og evidensnivå

J Valderhaug (†1999)

PII: S0300-5712(96)00008-5

*Journal of Dentistry*, Vol. 25, No. 2, pp. 97–105, 1997

Printed in Great Britain
0300–5712/97 $17.00+0.00

## Assessment of the periapical and clinical status of crowned teeth over 25 years

J. Valderhaug, A. Jokstad, E. Ambjørnsen and P. W. Norheim
*Department of Prosthetic Dentistry and Stomatognathic Physiology, Dental Faculty, University of Oslo, Oslo, Norway*

**ABSTRACT**

*Objectives:* The purpose of this study was to examine radiographically changes in the periapical status and compare the clinical status of teeth with a vital pulp and root-filled teeth restored with crowns and bridge retainers during 25 years.

*Methods:* During 1967/68, 114 patients received prosthodontic treatment by senior dental students at the Oslo Dental Faculty. In all, 291 teeth with a vital pulp and 106 root-filled teeth were restored with 158 prostheses. All root-filled teeth were restored with a cast dowel and core. The casts were made in a type-3 gold alloy, and cemented with zinc phosphate cement. Forty-six teeth were restored with crowns and 351 teeth with bridge retainers. Radiographs were taken preoperatively, immediately after cementation, and

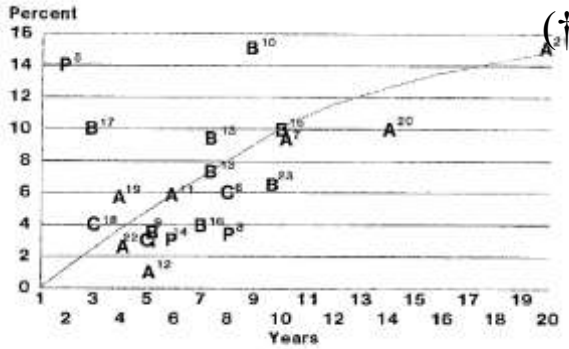
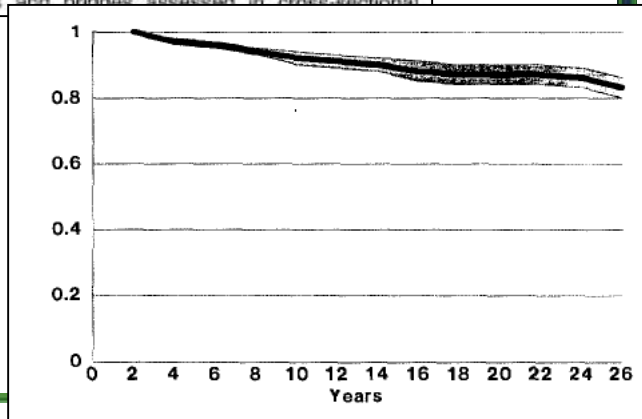
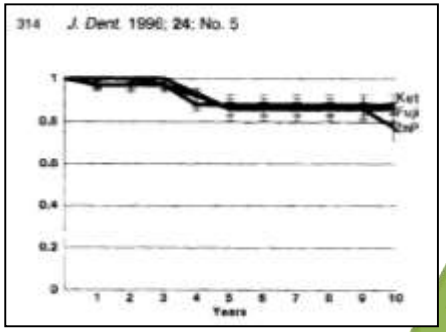
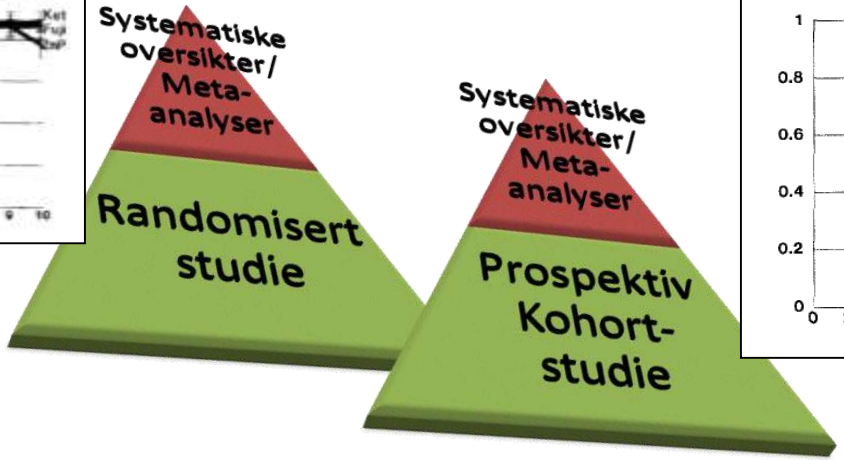


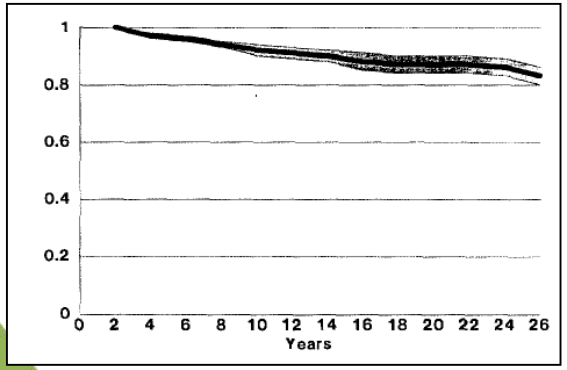

*Fig. 1.* Reported frequencies of periapical changes on teeth restored with crowns and bridges assessed in cross-sectional




**Senior-studentene Od.Fak 1968/1969**
**Svært få pilarer mistet sin tannvitalitet over 25 år**




# PROBLEMATIKK MHT EVIDENS FRA KLINISKE STUDIER – SPESIELT RANDOMISERTE STUDIER

# Valg mellom alternative behandlinger – hva ønsker klinikere å få klarlagt?

1. God evidens for at alternativ A **er bedre** enn alternativ B
2. God evidens for at alternativ A **er dårligere** enn alternativ B

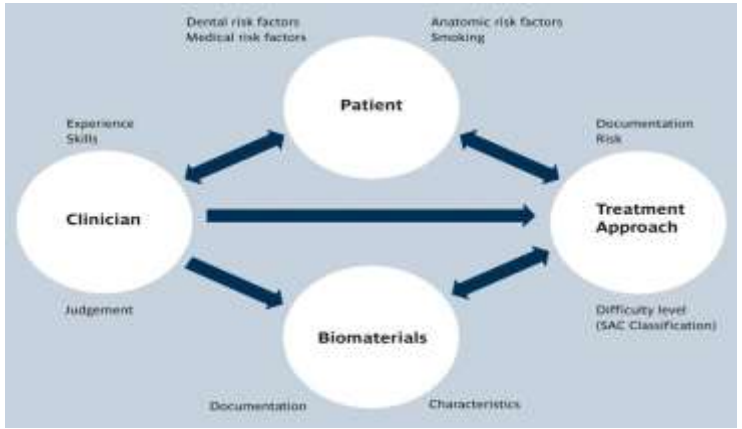
3. Middels evidens for at alternativ A **er bedre** enn alternativ B
4. Middels evidens for at alternativ A **er dårligere** enn alternativ B

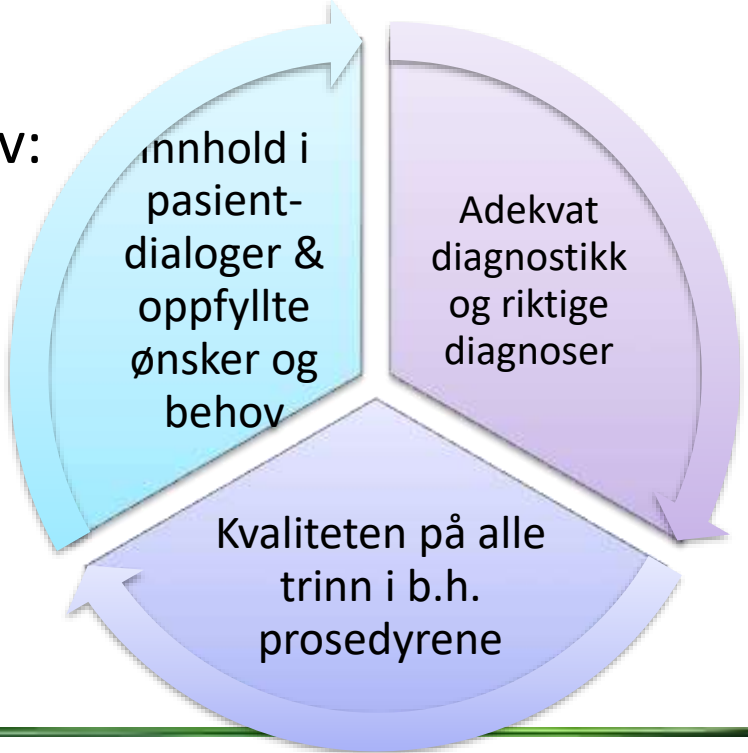
5. Dårlig evidens for at alternativ A **er bedre** enn alternativ B
6. Dårlig evidens for at alternativ A **er dårligere** enn alternativ B

# Et behandlings-resultat – kan egentlig én faktor av betydning isoleres i en klinisk studie? Er i så fall studien en refleksjon av rea;iteten?

Pasientopplevelse av behandlingsresultater er avhengig av:

& kombinasjon av mange faktorer:



# Tenkbare variasjoner i fremstilling av fast protese

1. Roterende instrumenter, prepareringsform
2. Rotstift, materiale & prosedyrer
3. Gingival retraksjon, materiale & prosedyrer
4. Avtrykk, materiale & prosedyrer
5. Bittregistrering, materiale & prosedyrer
6. Fargeuttak, metode
7. Midlertidig, materiale & sement & prosedyrer
8. Krone-bro materiale
9. Fremstillingsmetode for krone-bro
10. Sement og sementerings-prosedyre
11. Finjusteringer, okklusjon, hygieneinstruksjon

A. Karbon-stift sementert med resin er bedre enn andre typer stifter

B. Kvarts-stift sementert med resin ...

C. Glass-stift sementert med resin ....

D. Hybrid-stift sementert med resin ....

E. Støpt stift-konus sementert med Zn-sement ....

# 13. FIBERFORSTERKET STIFTER HAR NÅ ERSTATTET STØPTE STIFTER – N'EST-CE PAS?

# Vitenskapelig kunnskap og evidensnivå

- Goodacre CJ. Carbon fiber posts may have fewer failures than metal posts. J Evid Based Dent Pract 2010;10(1):32-4
- Baba NZ, Golden G, Goodacre CJ. Nonmetallic prefabricated dowels: a review of compositions, properties, laboratory, and clinical test results. J Prosthodont 2009; 18(6):527-36
- Bolla M, Muller-Bolla M, Borg C, Lupi-Pegurier L, Laplanche O, Leforestier E. Root canal posts for the restoration of root filled teeth. Cochrane Database Syst Rev 2007;(1):CD004623. N=1.

# Vitenskapelig kunnskap og evidensnivå

J Valderhaug
(†1999)

PII: S0300-5712(96)00008-5

*Journal of Dentistry*, Vol. 25, No. 2, pp. 97–105, 1997

Printed in Great Britain
0300–5712/97 $17.00+0.00

ELSEVIER

## Assessment of the periapical and clinical status of crowned teeth over 25 years

J. Valderhaug, A. Jokstad, E. Ambjørnsen and P. W. Norheim
*Department of Prosthetic Dentistry and Stomatognathic Physiology, Dental Faculty, University of Oslo, Oslo, Norway*

**ABSTRACT**

*Objectives:* The purpose of this study was to examine radiographicall
and compare the clinical status of teeth with a vital pulp and root-fille
bridge retainers during 25 years.

*Methods:* During 1967/68, 114 patients received prosthodontic treatme
Oslo Dental Faculty. In all, 291 teeth with a vital pulp and 106 root-f
prostheses. All root-filled teeth were restored with a cast dowel and cor
gold alloy, and cemented with zinc phosphate cement. Forty-six teeth v
teeth with bridge retainers. Radiographs were taken preoperatively, im

**Lengst prospekte kliniske studien som noengang har blitt publisert**

**Senior-studentene Od.Fak 1968/1969**
**Alle endobehandlede tenner utført lege artis ved Od.Fak.**
**Alle endobehandlede tenner laget støpt stift.**
**KAR Gamma-gull-akrylat-broer**
**Sementert med Sinkfosfat-sement**
**Rapportert funn etter;**
**5 – 10 – 15 & 25 år**
**Svært få stiftløsninger over 25 år**
**Enda færre vertikale tannfrakturer**

A. Enkeltkrone på implantat er langt dyrere enn en bro i lengden

B. Enkeltkrone på implantat er dyrere enn en bro i lengden

C. Enkeltkrone på implantat er sammenliknbar med en bro i lengden

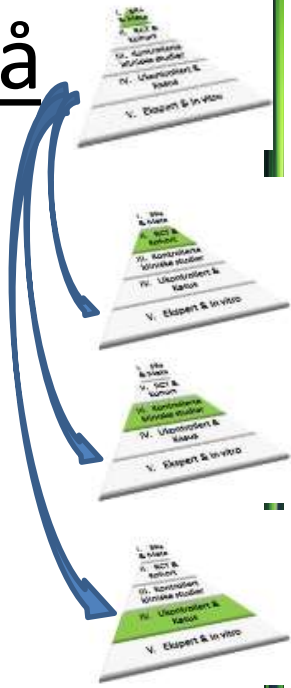
D. Enkeltkrone på implantat er billigere enn en bro i lengden

E. Enkeltkrone på implantat er langt billigere enn en bro i lengden

# 14. ER KOSTNADENE FOR ENKELT-IMPLANTAT OG FOR EN LITEN BRO LIKEVERDIGE SETT OVER TID?

# Vitenskapelig kunnskap og evidensnivå


- Vogel R, Smith-Palmer J, Valentine W. Evaluating the health economic implications and cost-effectiveness of dental implants: a literature review. Int J Oral Maxillofac Implants 2013;28(2):343-56.
- Scheuber S, Hicklin S, Brägger U. Implants versus short-span fixed bridges: survival, complications, patients' benefits. A systematic review on economic aspects. Clin Oral Implants Res 2012;23 Suppl 6:50-62.
- Pjetursson BE, et al. Comparison of survival and complication rates of tooth-supported fixed dental prostheses (FDPs) and implant-supported FDPs and single crowns (SCs). Clin Oral Implants Res 2007;18 Sup 3:97-113.
- Salinas TJ, Eckert SE. In patients requiring single-tooth replacement, what are the outcomes of implant- as compared to tooth-supported restorations? Int J Oral Maxillofac Impl 2007;22 Sup:71-95.

# Vitenskapelig kunnskap og evidensnivå

J Ørstavik (†2003)

Odontologi 2002

Prognose for oral protetikk – hva skal vi fortelle pasienten?

ASBJØRN JOKSTAD OG JON ØRSTAVIK

*Det er vanskeligt at spå – især om Fremtiden.*
Storm-P

Innledning

Prognose – fra gresk *pro gnosis* – kan bokstavelig oversettes som forut-kunnskap eller forut-erkjennelse. Uttrykket anvendes innen mange ulike fagområder hvor man ønsker å beskrive sannsynlig utvikling av ulike tilstander. I medisinsk sammenheng ble begrepet tatt i bruk på 1600 tallet som uttrykk for den forventede utvikling av en sykdomstilstand, basert på sykdommens generelle natur og på dens symptomatologi i det enkelte kasus. I dag kan forløpet av de aller fleste sykdomstilstander påvirkes i betydelig grad av våre behandlingsvalg, og uttrykket spesifiseres ofte ved å knytte det ikke bare til sykdommen, men også til terapivalg.

Fra diagnose til terapi, fra terapi til prognose

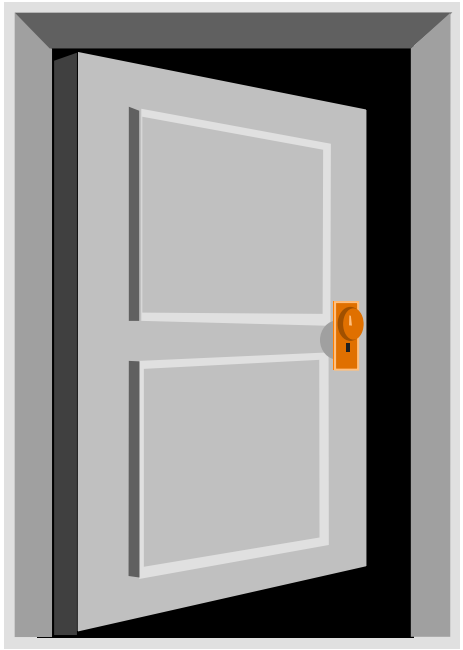
Protetisk tannbehandling er karakterisert ved enkelte hovedtrekk som gjør applikasjon av prognosebegrepet i tradisjonell medisinsk forstand komplisert:

- For det første benyttes proteser som erstatning for tenner hos pasienter med et vidt spektrum av bakenforliggende årsaker

139

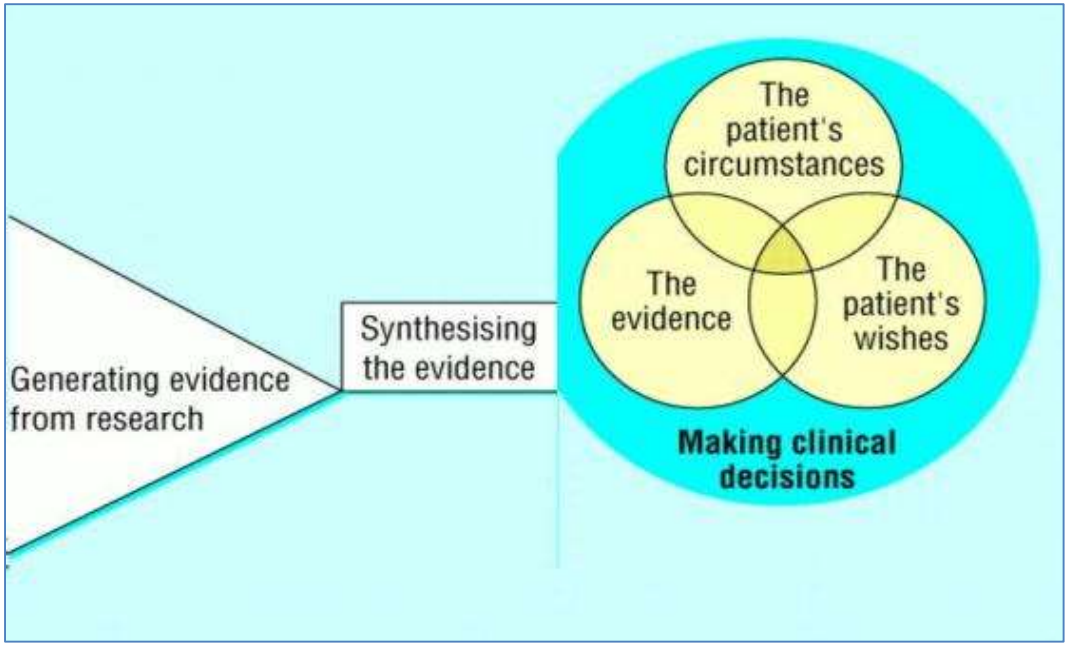
1. *Hva vil skje med kvaliteten av restvevet, inklusive eventuelt rettannsettet, med eller uten protetisk behandling?*
2. *Hvordan vil funksjoner tilhørende det stomatognatiske systemet endres med eller uten protetisk behandling?*
3. *Hvordan vil pasientdefinerte kriterier, eksempelvis estetikk, funksjon, komfort endres med eller uten protetisk behandling?*
4. *Hva vil skje videre med en eventuelt eksisterende protese med eller uten videre behandling?*

# Hvordan kan jeg praktisere dette nye “EBM” ?



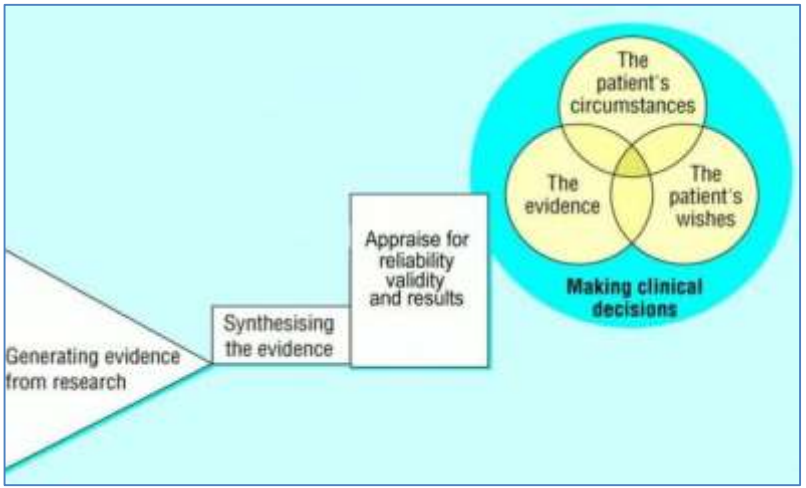
# Hvordan utøve evidens-basert praksis?

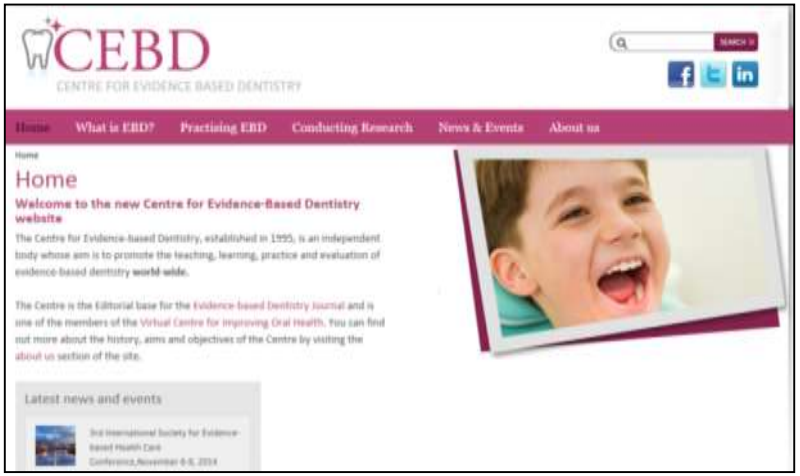
1. Lære selv hvordan evidens-basert odontologi appliseres I praksis
   - Bøker
   - Seminarer
   - Internett
     - Online link-lister
     - Online kurs
     - Online ressurser



# Hvordan utøve evidens-basert praksis?

1. Lære selv evidens-basert odontologi
2. Søke og anvende evidens-baserte sammendrag utarbeidet av andre
    1. Fagtidsskrift som kritisk evaluerer primærstudier
    2. Systematiske oversikter
    - Cochrane Collaboration
    - Nat. Health Serv. R&D
    - Litteratur

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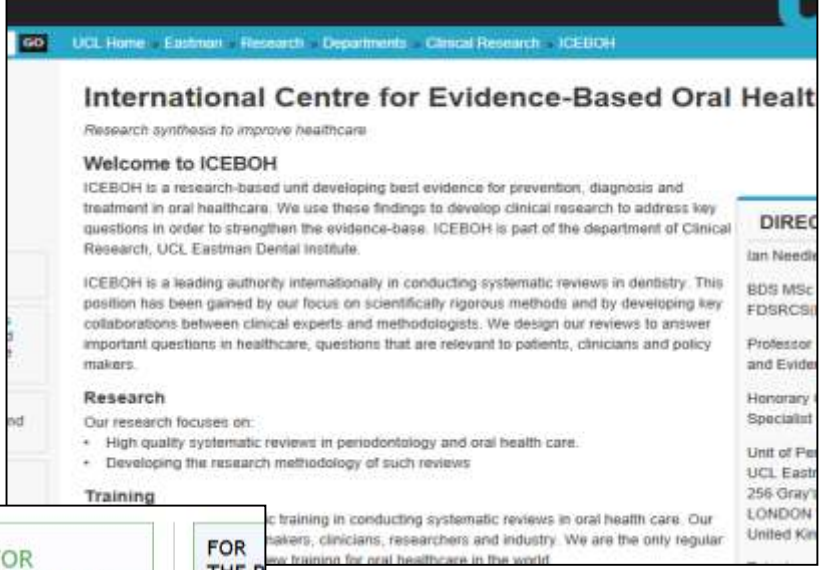
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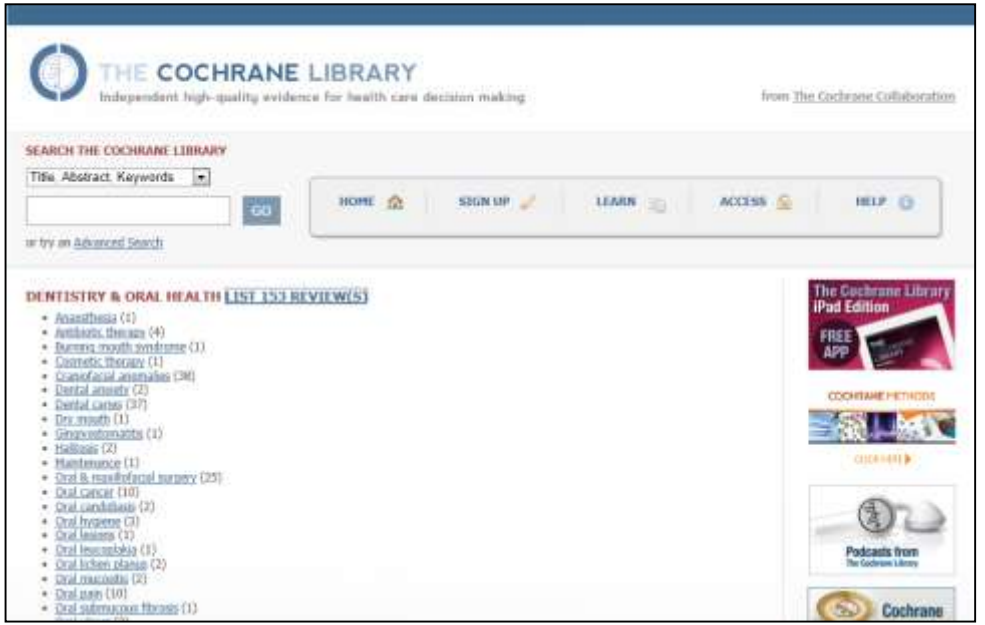
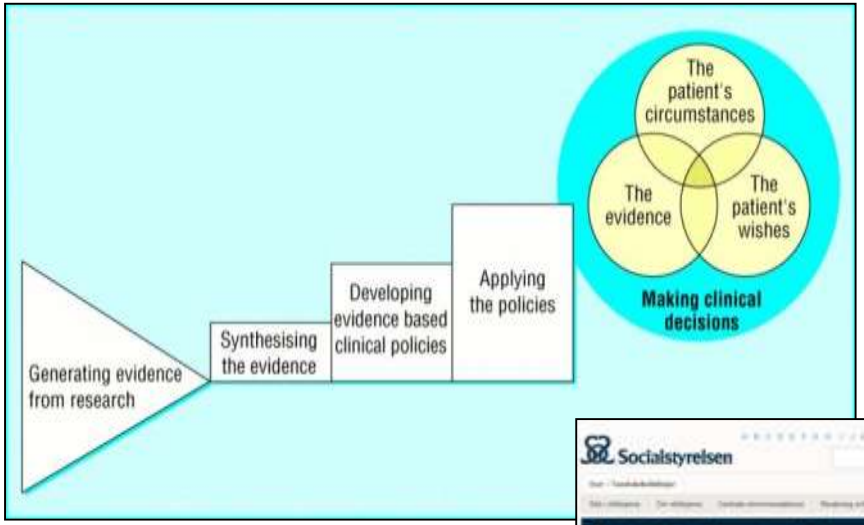


# Hvordan utøve evidens-basert praksis?

1. Lære selv evidens-basert odontologi
2. Søke og anvende evidens-baserte sammendrag utarbeidet av andre
3. Akseptere og anvende kliniske retningslinjer som er baserte på evidens-baserte prinsipper




# Takk for bidrag av kliniske bilder fra

- Tannlege Brett Ayliffe, New Brunswick
- Professor Carl-Göran Crossner, Tromsø
- Tannlege Joseph Fava, Toronto
- Tannlege Soheila Kermali, York
- Tannlege Mark Lin, Toronto
- Tannlegene Arild Mo, Carl Hjortsjø & Heming Berg-Olsen, Drammen