



Dansk Endodontiforeningens Årsmøde 2012 Hindsgalv

Disputats forsvar maj

**Endodontic treatment:
reasons, prevention and
quality-shaping factors**

LARS BJØRNDAL

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Lars Bjørndal
Afdeling for
Cariologi og
Endodonti



INKLUDEREDE PUBLIKATIONER

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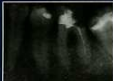
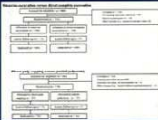


6 PUBLIKATIONER

- Bjørndal L, Reit C (2004) The annual frequency of root fillings, tooth extractions and pulp-related procedures in Danish adults during 1977-2003. *International Endodontic Journal* **37**, 782-8.
- Bjørndal L, Laustsen MH, Reit C (2006) Root canal treatment in Denmark is most often carried out in carious vital molar teeth and root canal treatments are rare. *International Endodontic Journal* **39**, 785-90.
- Bjørndal L, Bruun G, Markvart M, Thordrup M, Dige I, Ericson D, Laustsen MH, Reit C (2007) The effect of treatment of root canal treated teeth with a randomized controlled trial of direct composite vs. direct composite with a partial crown vs. partial crown with a partial crown. *Journal of Oral Sciences* **109**, 1059-65.
- Bjørndal L, Reit C (2005) The adoption of endodontic technology amongst Danish general dental practitioners. *International Endodontic Journal* **38**, 52-8.
- Bjørndal L, Laustsen MH, Reit C (2007) Danish practitioners' assessment of factors influencing the outcome of endodontic treatment. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology* **103**, 570-5.
- Bjørndal L, Reit C (2008) Endodontic malpractice claims in Denmark 1995-2004. *International Endodontic Journal* **41**, 1059-65.



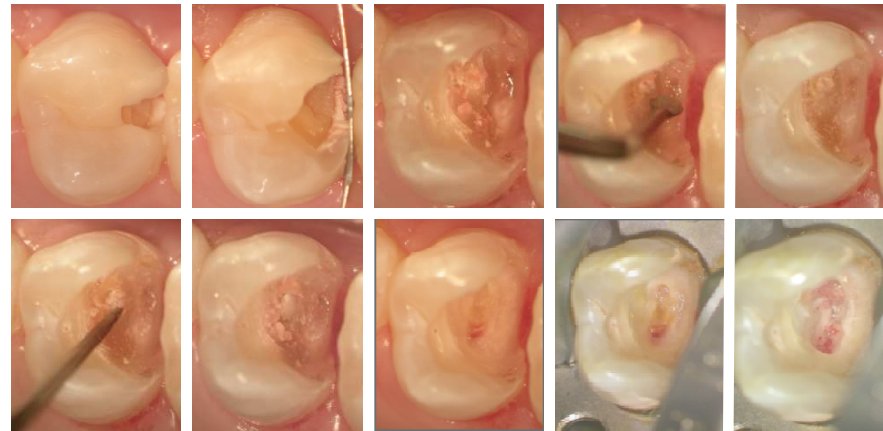

Profund caries handling (Ekskaverings dilemma)

Endodontic treatment:
~~reasons, prevention and~~
quality-shaping factors




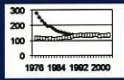
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Muligheden for at behandle den eksponerede pulpa


Endodontic treatment:
~~reasons, prevention and~~
quality-shaping factors



Year	Value
1970	0
1984	100
1992	200
2000	300

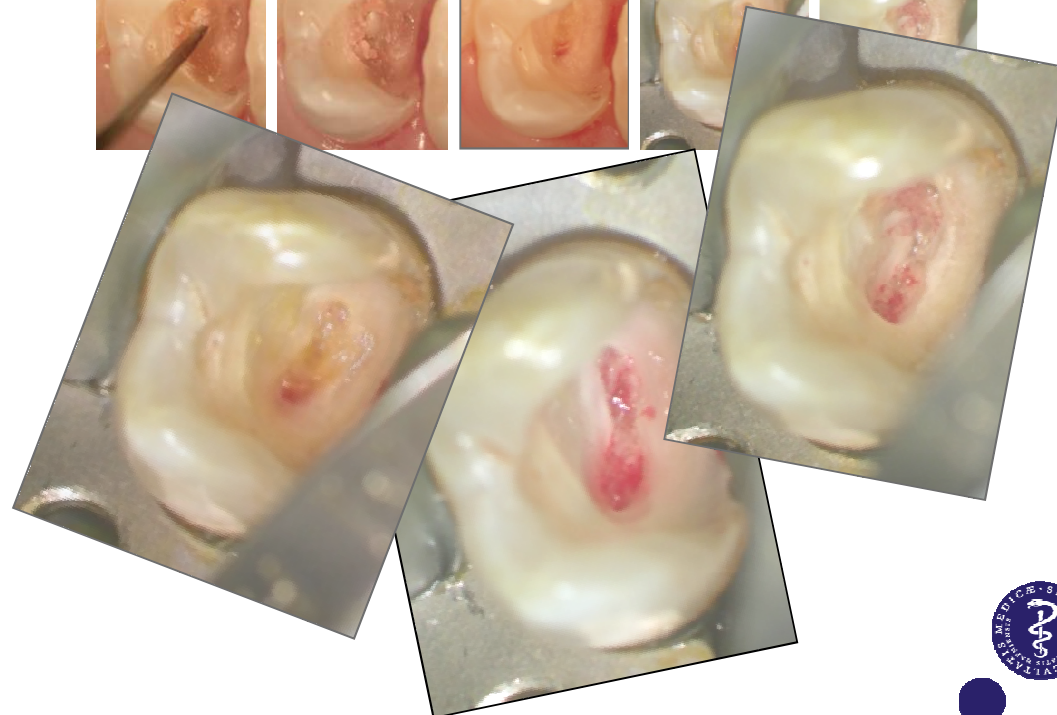
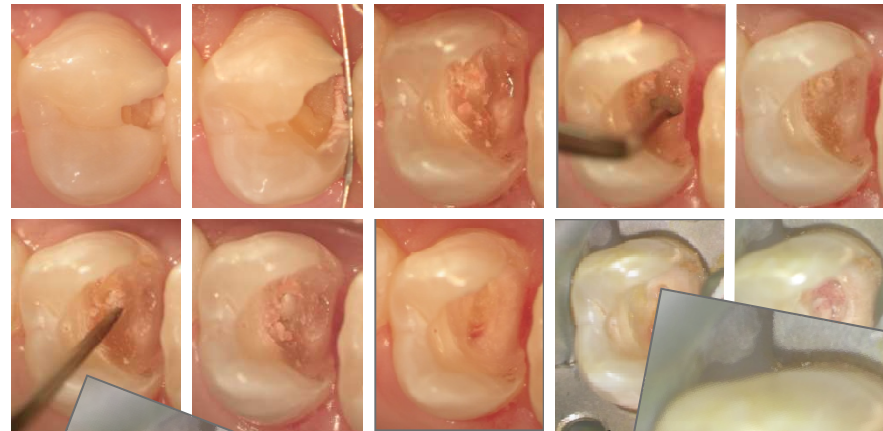



Year	Value
1970	0
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Fjernelsen af den irreversible inflammerede pulpa (Pulpektomi)

Endodontic treatment: reasons, prevention and quality-shaping factors

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here applying instrumentation with nickel-titanium instruments.



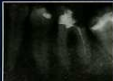
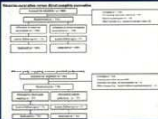


duration of a... with... X-ray... central... is... exposure is... further... working... and... carried out... machine...

Bjørndal L, Nordic Dentistry Yearbook 2004



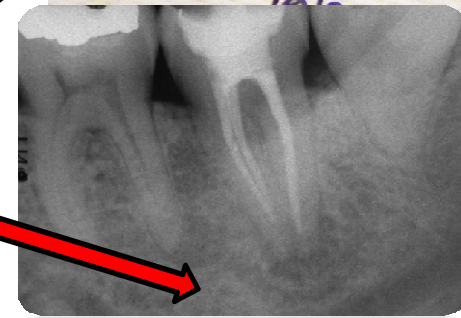
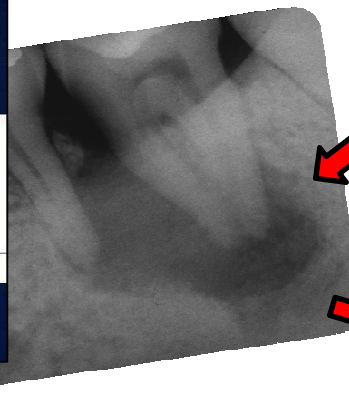
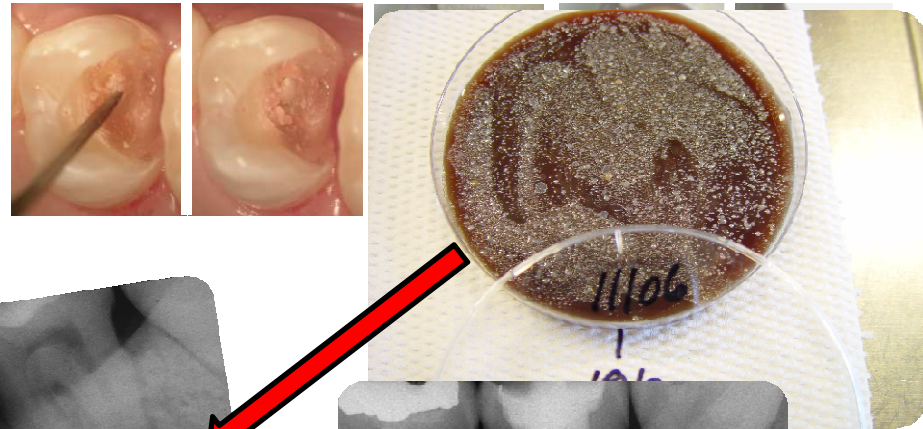
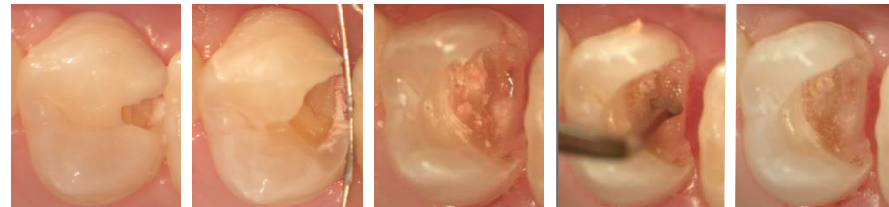
Kanal behandling af den nekrotiske og bakterieinficerede tand

Endodontic treatment:
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quality-shaping factors



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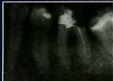
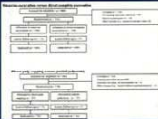




Bjørndal L,
Tandlægebladet 2010



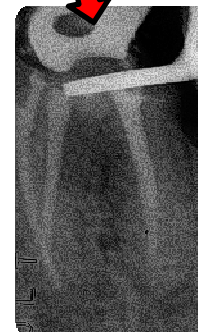
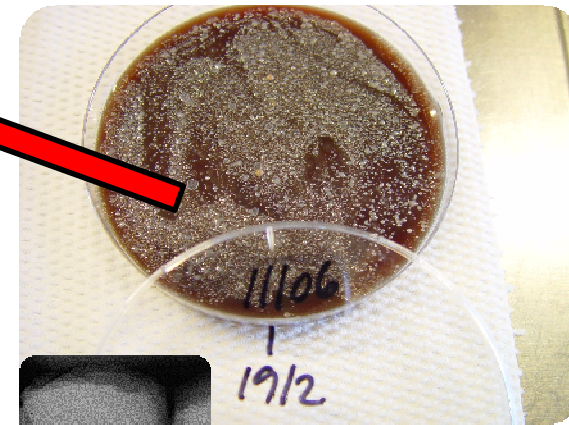
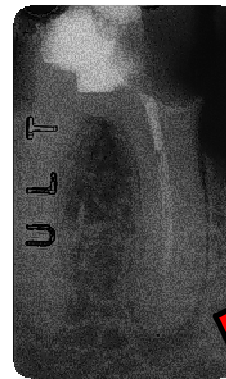

Revision af den rodfyldte tand

Endodontic treatment:
~~reasons, prevention and~~
quality-shaping factors



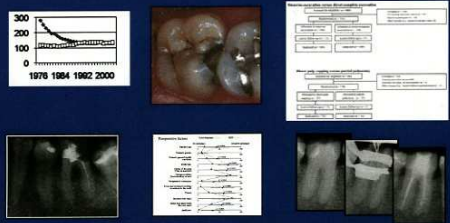
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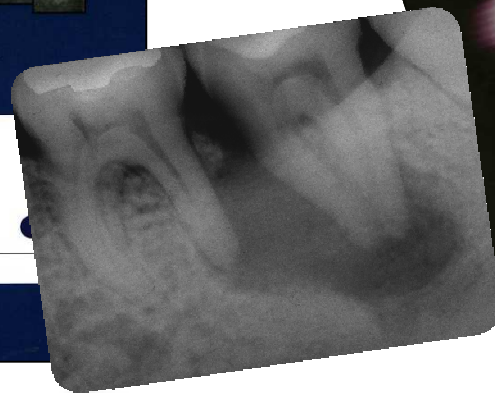
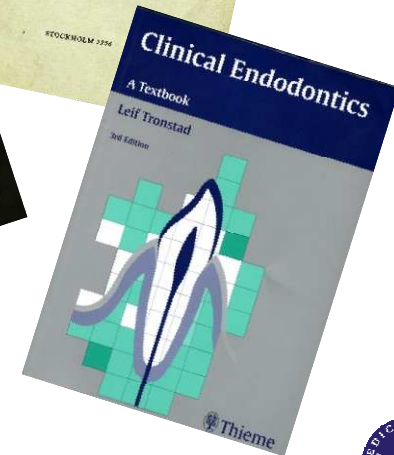
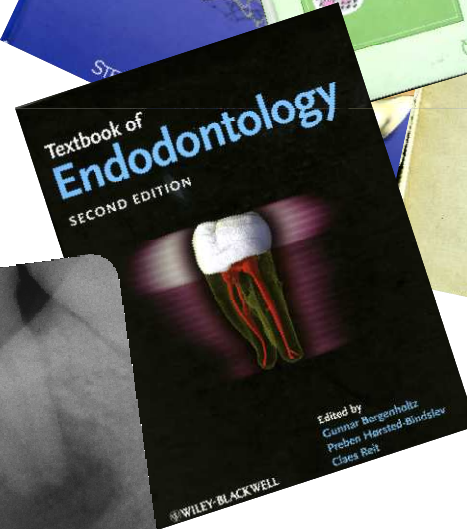
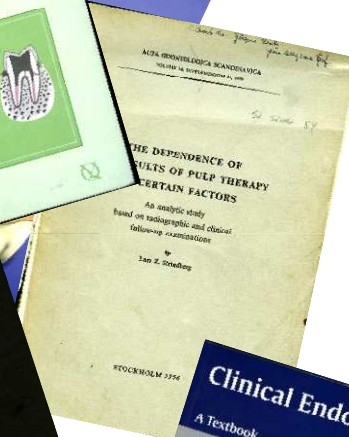
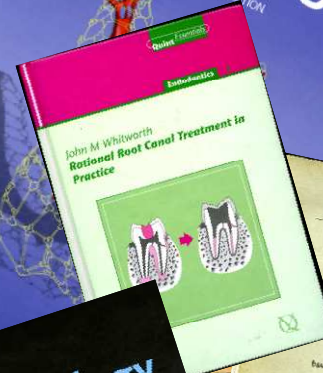
Setting the stage!

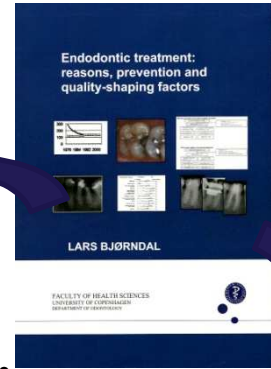
**Endodontic treatment:
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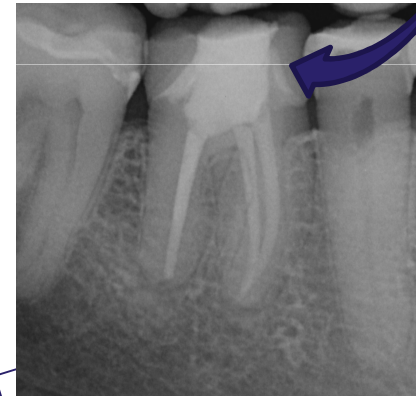
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De facto

Hvad man kan opnå



1997, Sidu
1998, De Moo
1999, Kirkevang et al.
2000, 2001, 2006
Boucher et al. 2002, Lupi-
Pegurier et al. 2002.,
Dugus et al. 2003, Loftus
et al. 2005, Ridell et al.
2006

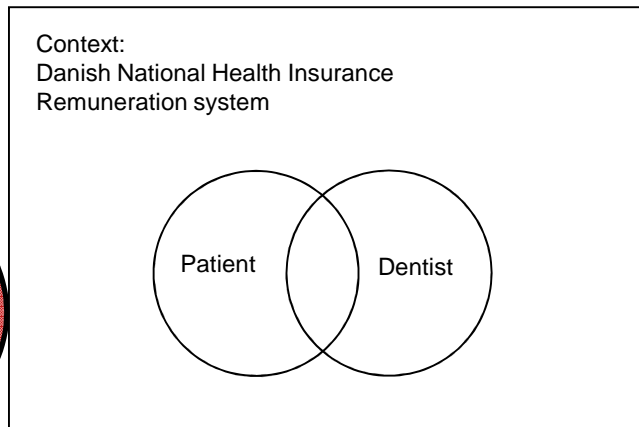
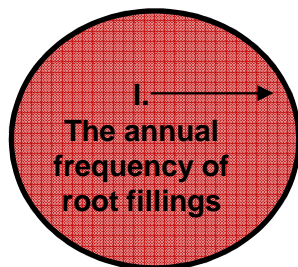
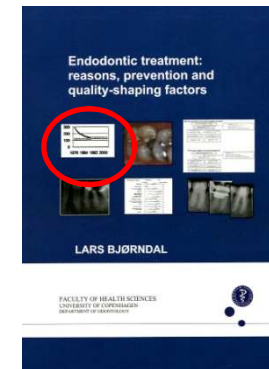
Strindberg et al. 1979
Pettersson et al. 1979
Kerekes & Tronstad 1979,
Sjögren et al. 1990.

Success

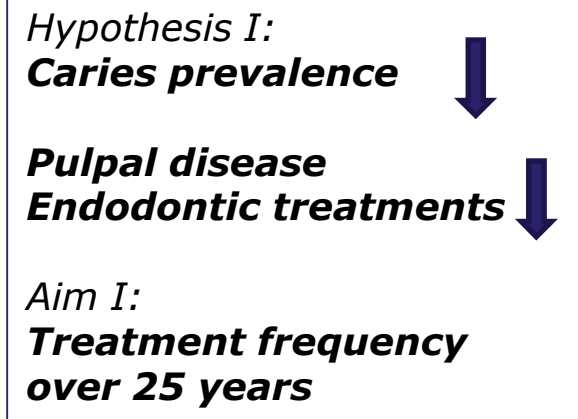
Gabet er stort

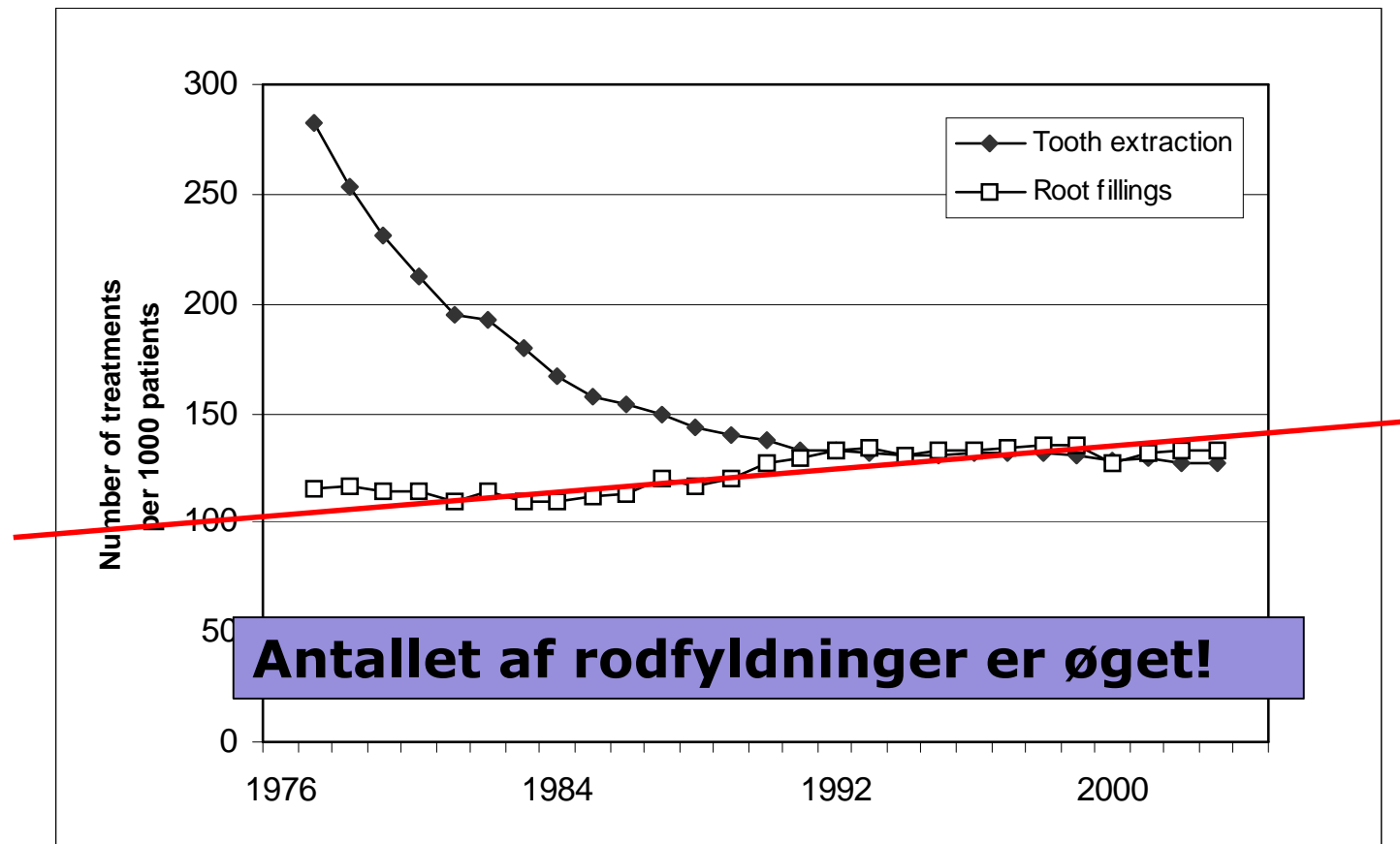


STUDIE I



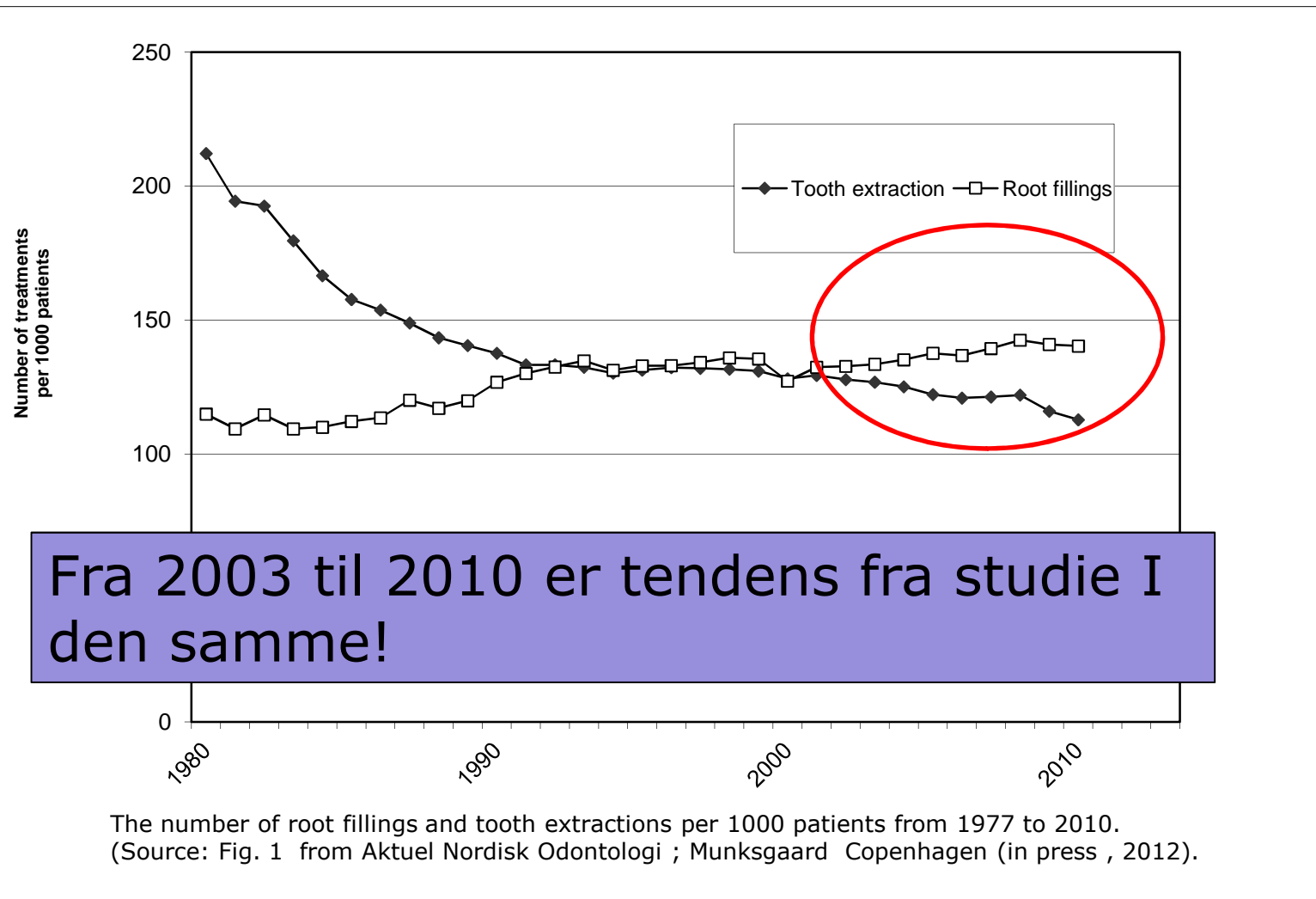
Context:
Danish National Health Insurance
Remuneration system



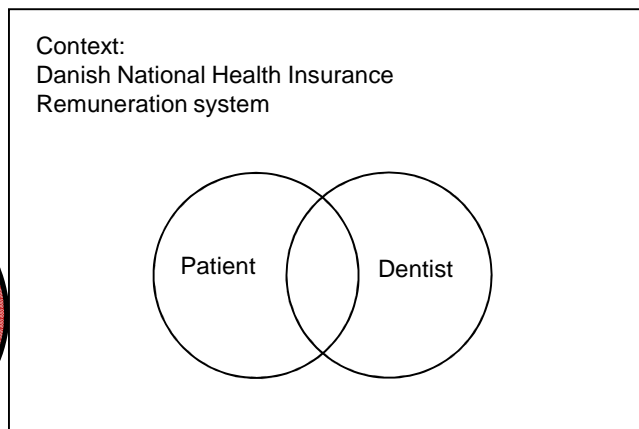
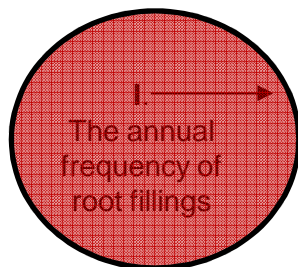
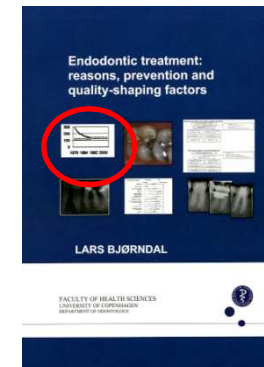


The number of root fillings and tooth extractions per 1000 patients from 1977 to 2003.
(Source: Fig. 2 from **Study I**. Reprinted with permission from International Endodontic Journal, Wiley-Blackwell, Oxford)

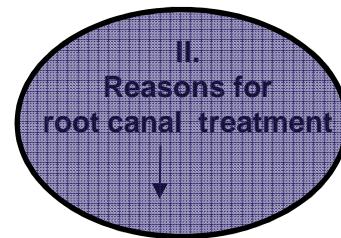




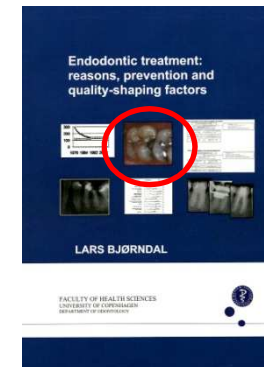
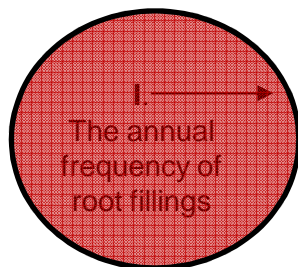
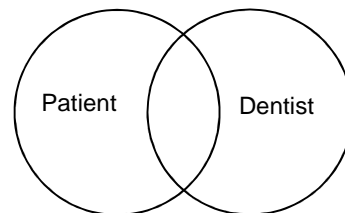
Antallet af rodfyldninger er øget!



STUDIE II



Context:
Danish National Health Insurance
Remuneration system



Hypothesis II:
***Caries not the main
reason for root canal
treatment***

Aim II:
***Questionnaire
exploring reasons for
root canal treatments***



Årsager til den sidst udførte rodbehandling?



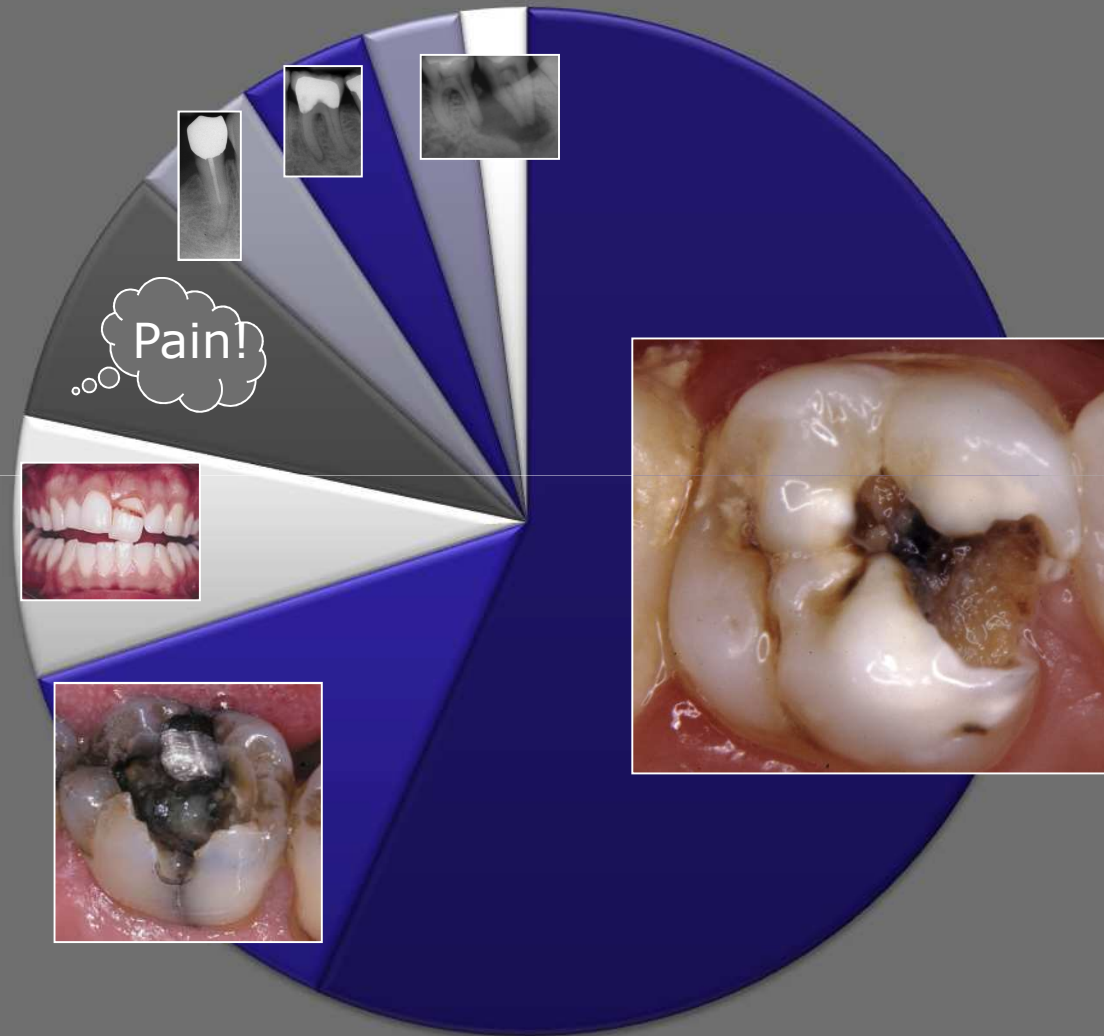
**600 tilfældigt udvalgte alment praktiserende
tandlæger**



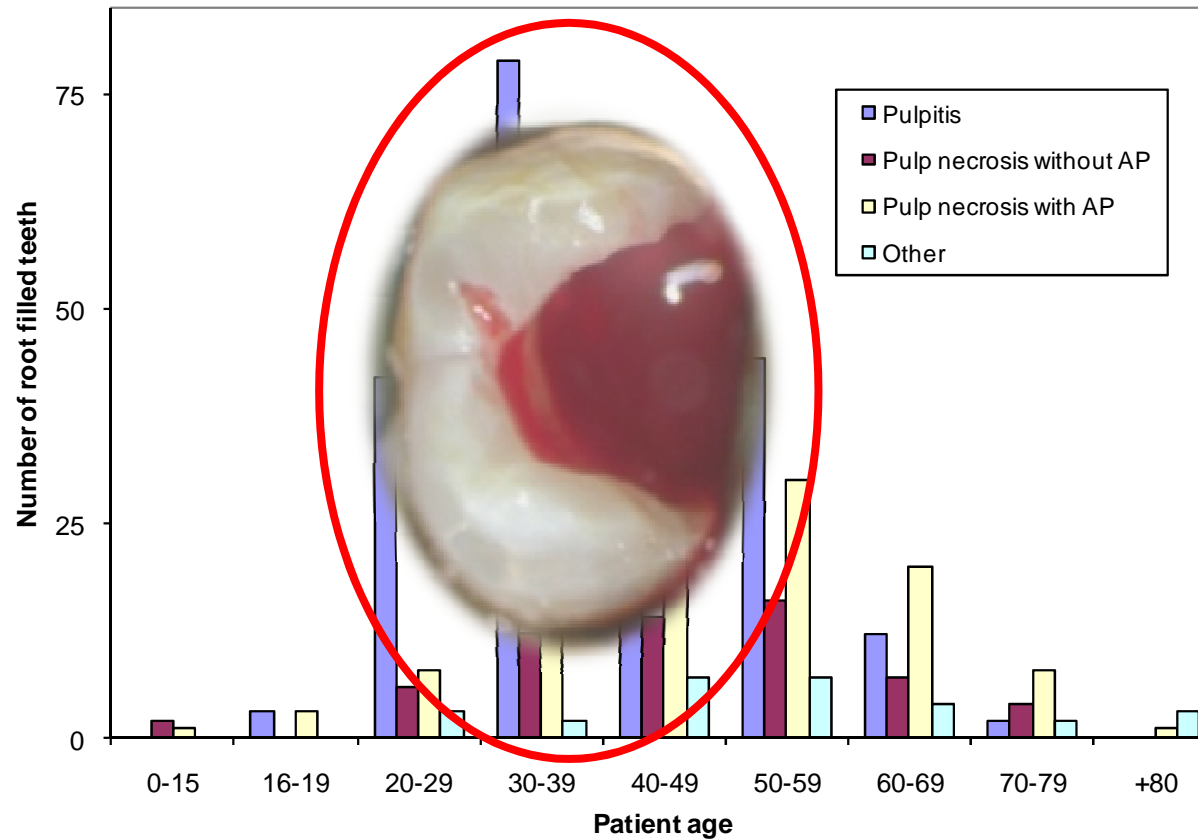
Reasons for root canal treatment



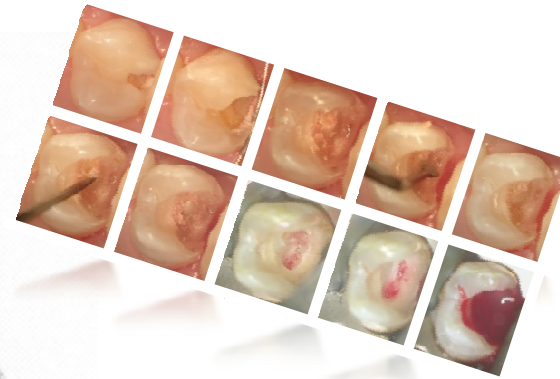
Reasons for root canal treatment



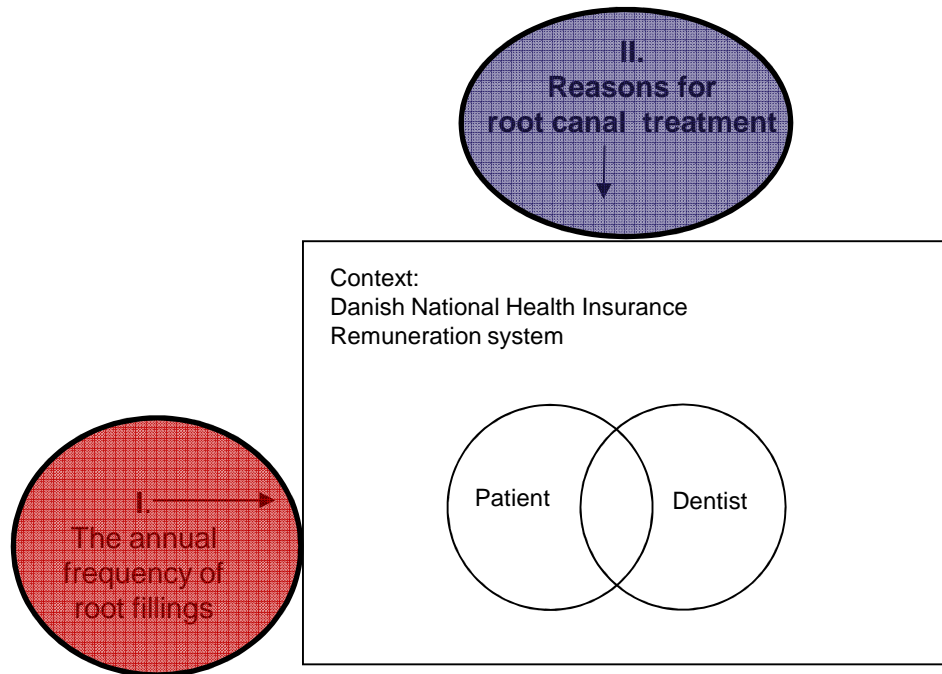
Pulpitis hyppigste diagnose !



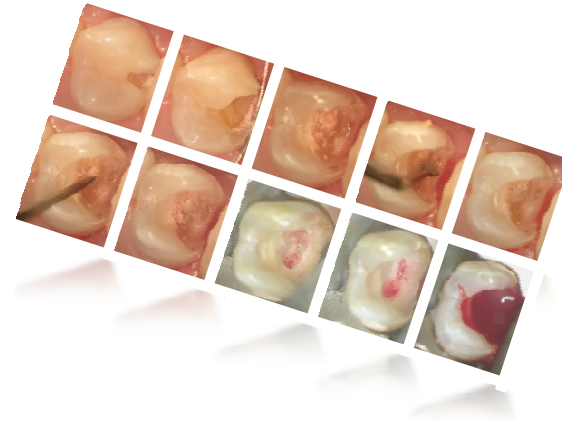
Typisk 'endo' case
in 2011!



Caries i vitale tænder er hoved årsag til rodbehandling!

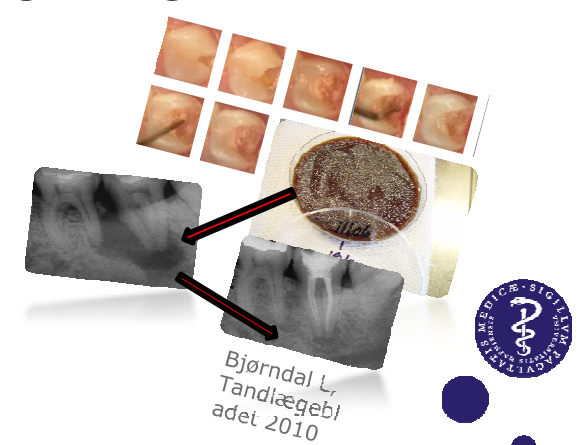
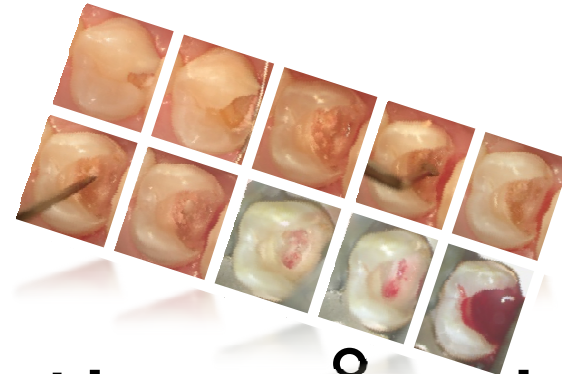


Kort sagt - mange pulpektomi behandlinger i relation til caries!



Kort sagt - mange pulpektomi
behandlinger i relation til
caries!

En kritisk kombination når vi
skal forebygge infektion af
rodkanalen

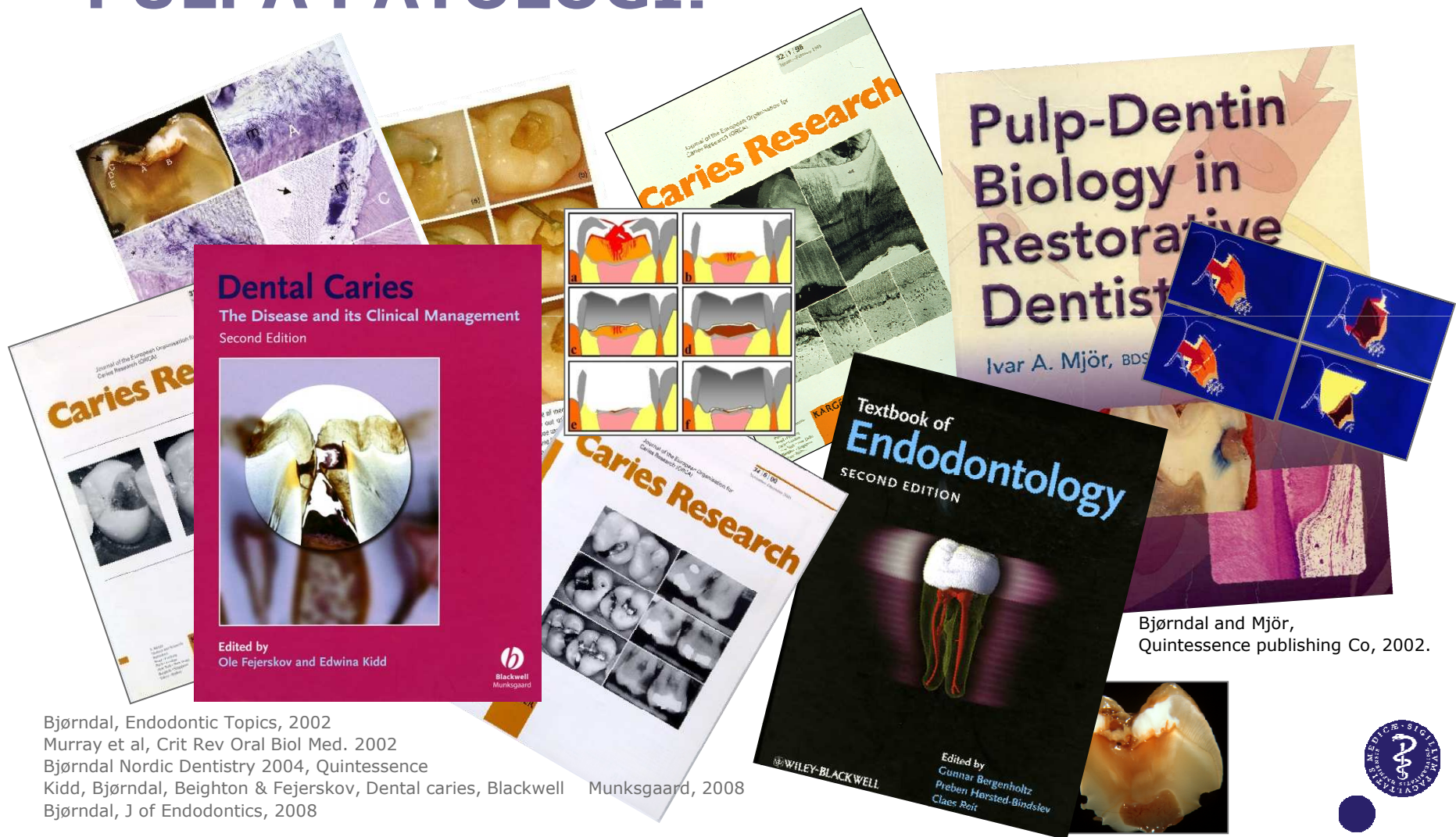


Bjørndal L,
Tandlægebladet
2010

En endodontisk forebyggelse strategi ved behandling af caries?



VED PROFUND CARIES EKSKAVERING BENYTTET VI VIDEN OM CARIES OG PULPA PATOLOGI!



Bjørndal, Endodontic Topics, 2002
Murray et al, Crit Rev Oral Biol Med. 2002
Bjørndal Nordic Dentistry 2004, Quintessence
Kidd, Bjørndal, Beighton & Fejerskov, Dental caries, Blackwell Munksgaard, 2008
Bjørndal, J of Endodontics, 2008

Bjørndal and Mjör,
Quintessence publishing Co, 2002.



Konklusioner fra Cochrane oversigt hvad angår caries ekskavering:

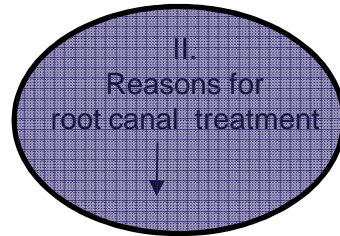
**Randomiserede kliniske
studier er nødvendige!!**

A decision must be made as to whether all carious tooth tissue should be removed, and this warrants a Clinical Trial it self. Another category of clinical trials should relate to the mangement of the exposed pulp

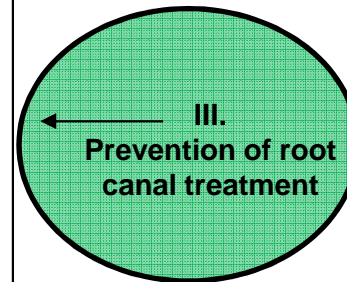
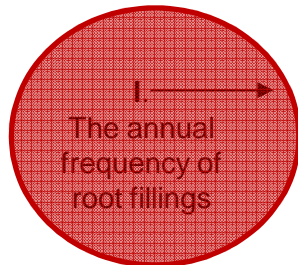
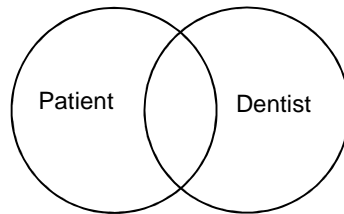
Miyashita H, Worthington HV, Qualtrough A, Plasschaert A 2007



STUDIE III

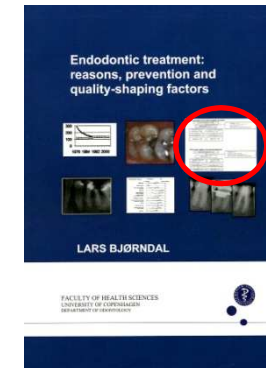


Context:
Danish National Health Insurance
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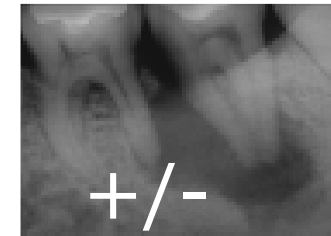
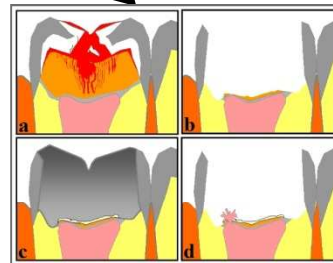
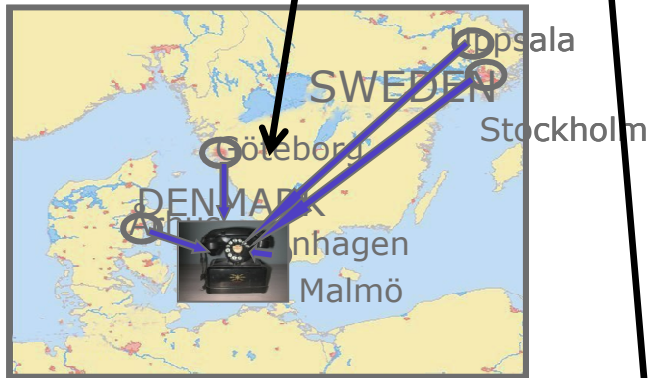


Aim IIIa:
**Randomized clinical trial
comparing one complete
excavation versus a
stepwise excavation**

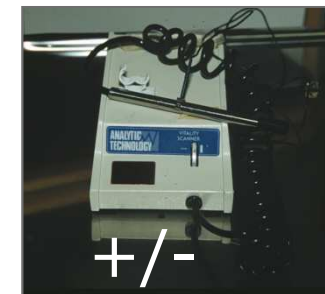
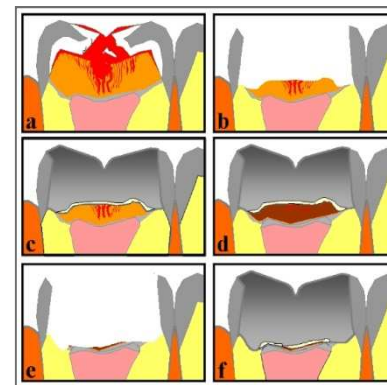
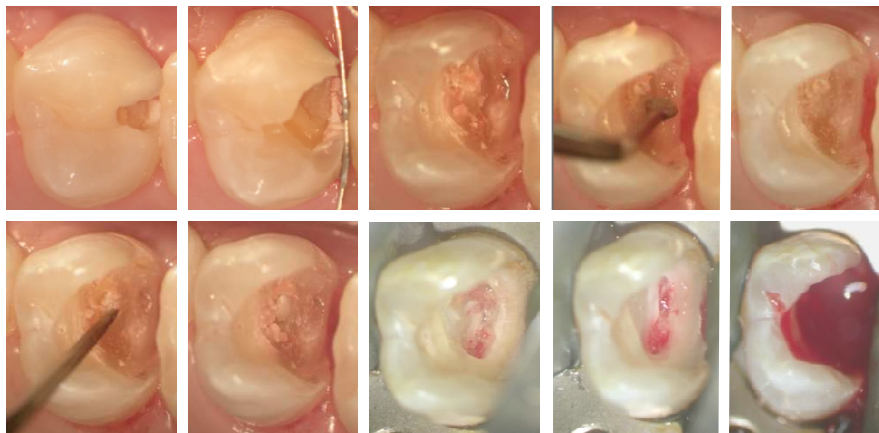
Aim IIIb:
**Randomized clinical trial
comparing direct pulp
capping versus partial
pulpotomy**



P I C O



VS

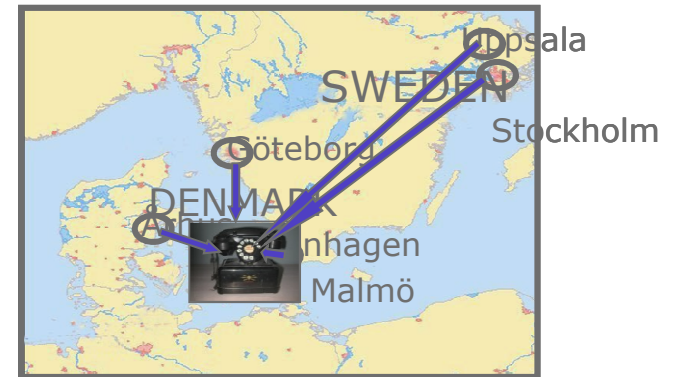


Pain!

Bjørndal, Endodontic Topics, 2002



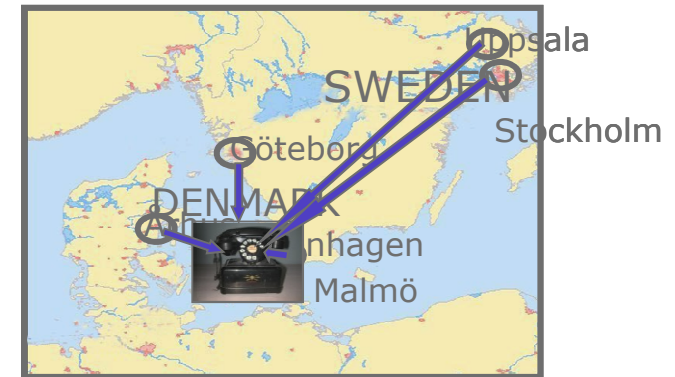
Et randomiseret klinisk multicenter forsøg - check list



- Inklusions og eksklusions kriterier
- Prognostisk faktorer ens fordelt
- 'Power' statistik
- Adequate allokerings sekvens
- Adequate allokerings låsning
- Blindet evaluering af kontrol data



Et randomiseret klinisk multicenter forsøg - check list



- **Inklusions og eksklusions kriterier**
- **Prognostisk faktorer ens fordelt**
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Den hierarkiske Evidenstrappe

- Ia Systematisk oversigtsartikler af høj-kvalitets randomisede kliniske forsøg
- Ib Randomisede kliniske forsøg

- II Cohort studier
- III Case-control studier
- IV Consensus rapporter, 'eksperter'



Den hierarkiske Evidenstrappe

- Ia Systematisk oversigtsartikler af høj-kvalitets randomisede kliniske forsøg
 - Ib Randomisede kliniske forsøg
-
- II Cohort studier
 - III Case-control studier
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Ikke så mange kliniske beh. bygger på høj evidens (Ia, Ib)

Manglende høj evidens betyder ikke, at der er frit valg på hylderne – det er heller ikke alle problemstillinger der behøver høj evidens data.

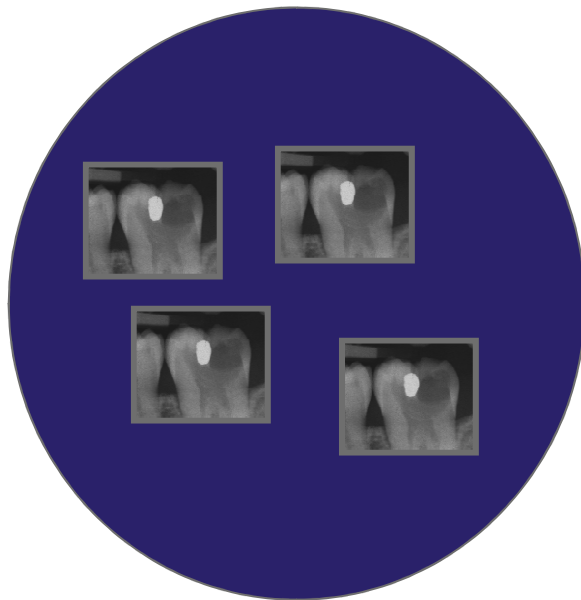


Det største problem i non-randomisedede studier

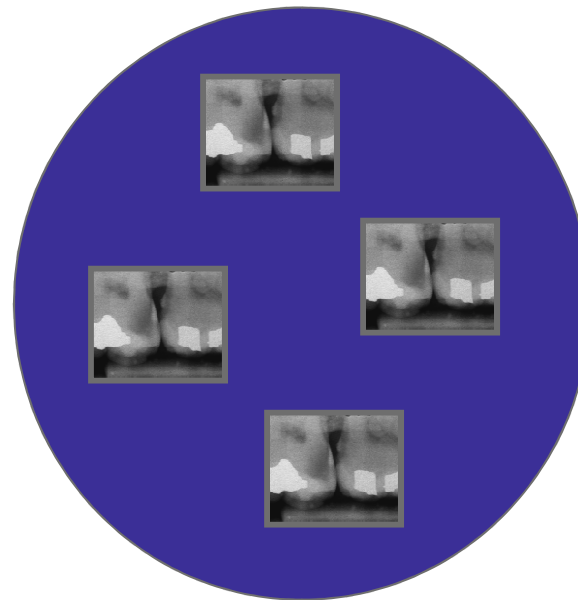
Manglende kontrol af faktorer der kan have betydning for resultatet - Caries forsøg eksempel:

Behandling B er ikke bedst til at forebygge pulpa perforation - materialet er skævt - bemærk alle læsionerne, er mindre i B-cirklen

Behandling A



Behandling B



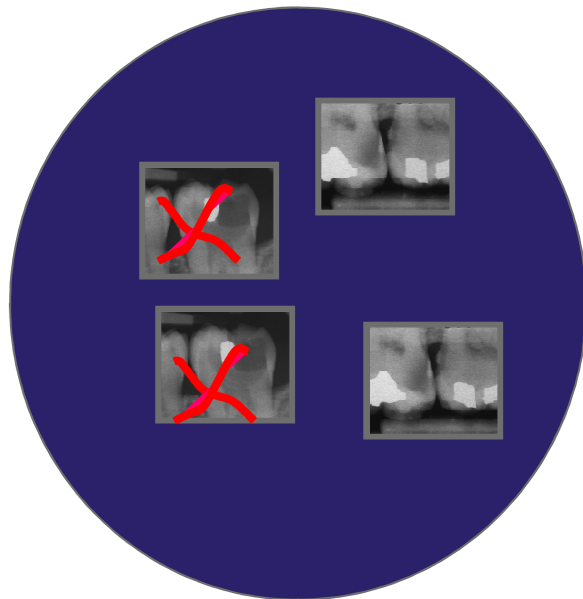
PROGNOSTISKE FAKTORER SKÆV FORDELT



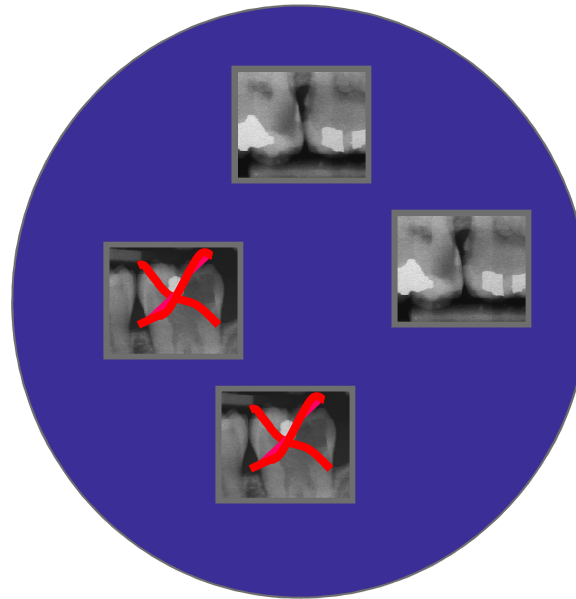
Randomised klinisk forsøg 'check' liste

Baseret på
inklusions og
eksklusions
kriterier kan
man forme to
ens
forsøgsgrupper

Behandling A



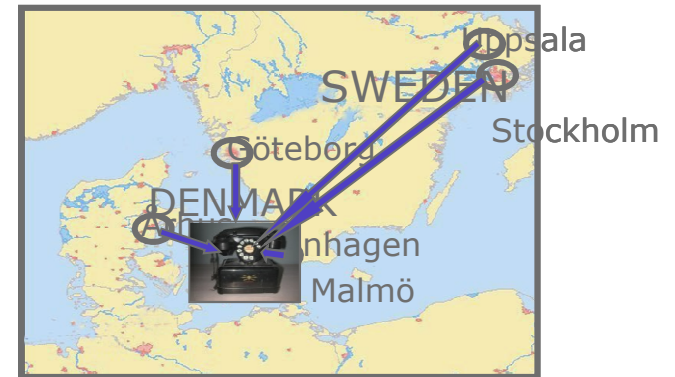
Behandling B



PROGNOSTISKE FAKTORER LIGELIGT FORDELT



Et randomiseret klinisk multicenter forsøg - check list



- Inklusions og eksklusions kriterier
- Prognostisk faktorer ens fordelt
- 'Power' statistik
- **Adequate allokerings sekvens**
- **Adequate allokerings låsning**
- Blindet evaluering af kontrol data

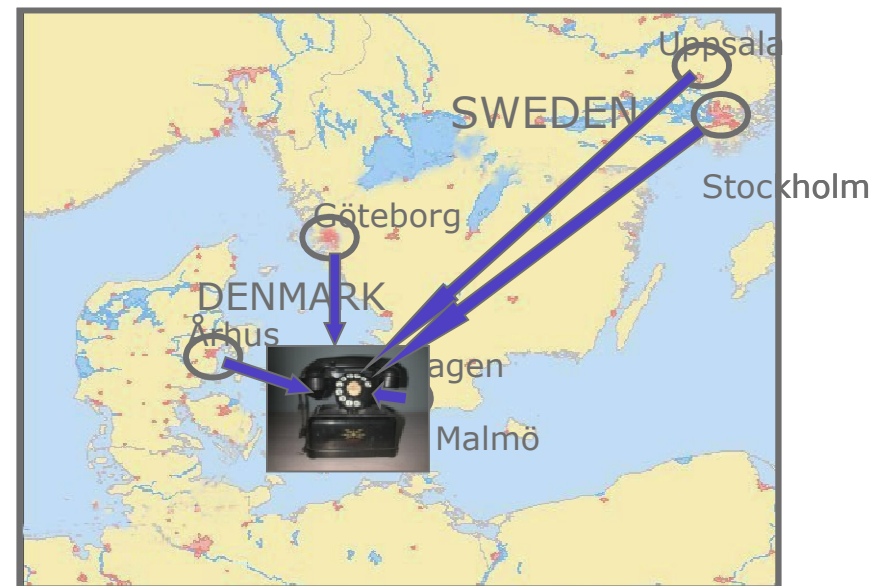


Inadequate randomiserings procedure

- Tendens til at overestimere behandlings effekt (Gluud LL, 2006)



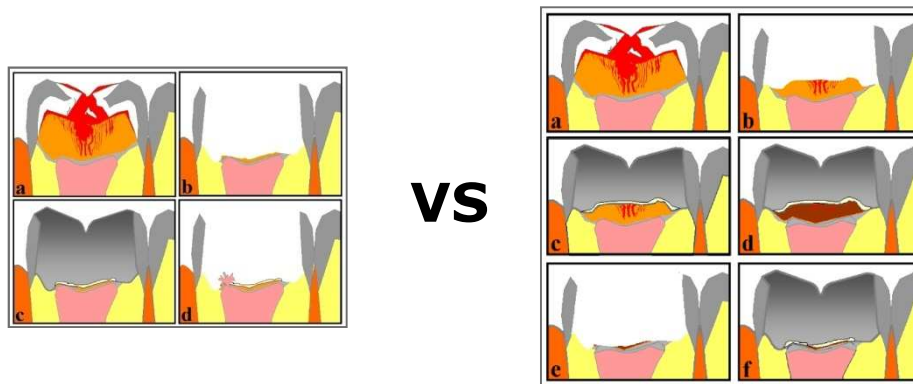
PROBLEM



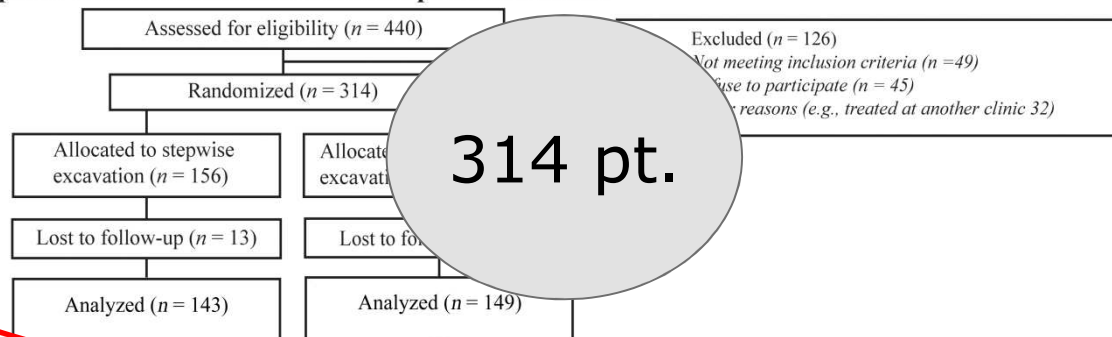
LØSNING



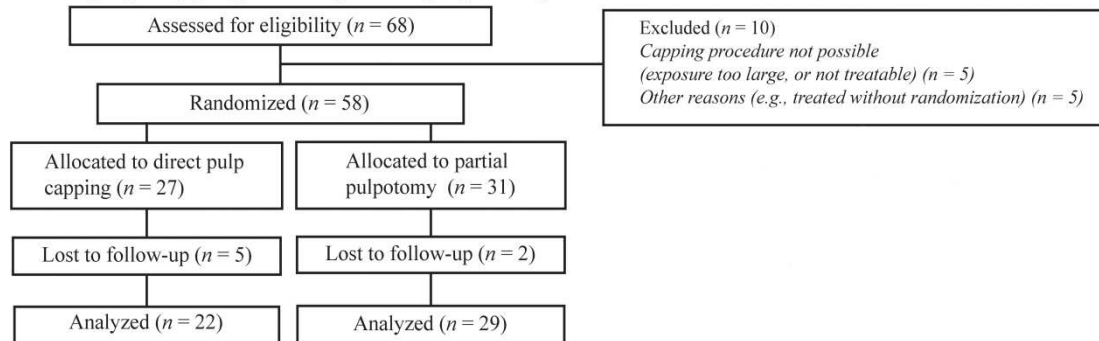
Tilbage til Resultaterne af STUDIE III



Stepwise excavation versus direct complete excavation



Direct pulp capping versus partial pulpotomy



Flowchart showing the number of patients according to enrolment, allocation, follow-up and final number of analyzed patients in the two trials (source: Fig.1, **Study III**. Reprinted with permission from European Journal of Oral Sciences, Wiley-Blackwell, Oxford)



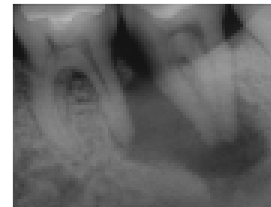
Absolut risiko reduktion på 11.7% til fordel for gradvis ekskaverering

Randomized (<i>n</i> = analyzed teeth)	Stepwise excavation (<i>n</i> = 143)	Direct complete excavation (<i>n</i> = 149)	Difference between groups (95% CI)	<i>P</i> -value
Success				
Pulp vitality without apical radiolucency <i>n</i> (%)	106 (74.1)	93 (62.4)	11.7 (0.5; 22.5)	0.044
Failures				
Pulp exposure <i>n</i> (%)	25 (17.5)	43 (28.9)	-11.4 (-21.3; -1.2)	0.030
Pulp vitality with apical radiolucency <i>n</i> (%)	2 (1.4)	2 (1.3)	0.1 (-3.5; 3.8)	0.665
No pulp vitality with apical radiolucency <i>n</i> (%)	2 (1.4)	4 (2.7)	-1.3 (-5.5; 2.8)	0.712
Unbearable pain* <i>n</i> (%)	8 (5.6)	7 (4.7)	0.9 (-4.8; 6.8)	0.934

*Resulting in pulpectomy.
CI, confidence interval.

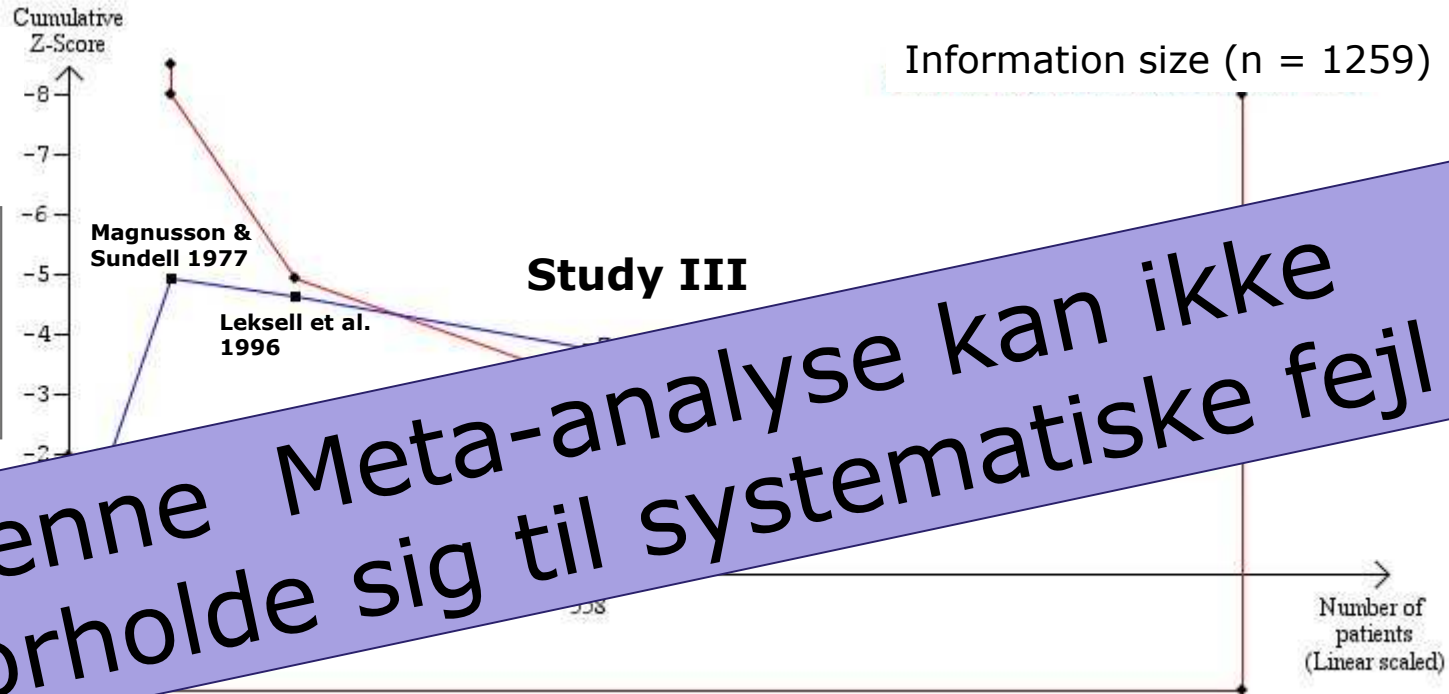
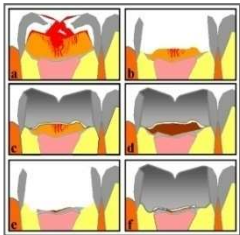


Outcome measure analysis of teeth at follow-up (Source: Table 2, **Study III**. Reprinted with permission from European Journal of Oral Sciences, Wiley-Blackwell, Oxford)



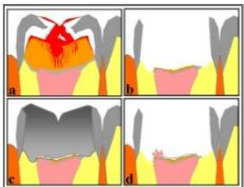
A trial sequential analysis using trial sequential boundaries

Favour stepwise

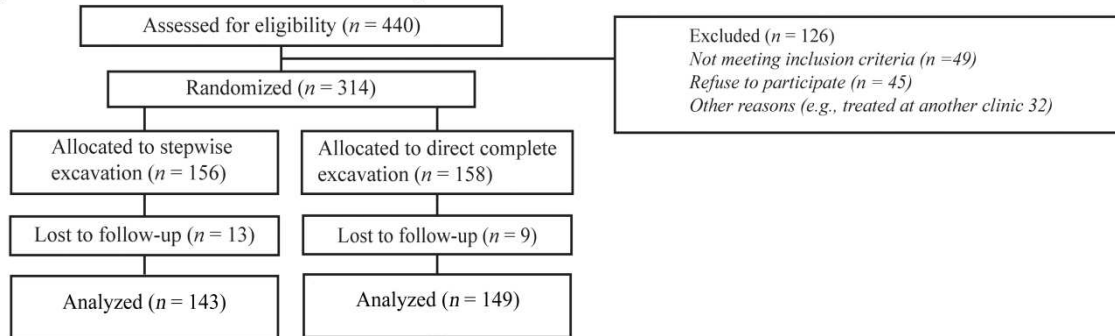


Denne Meta-analyse kan ikke forholde sig til systematiske fejl

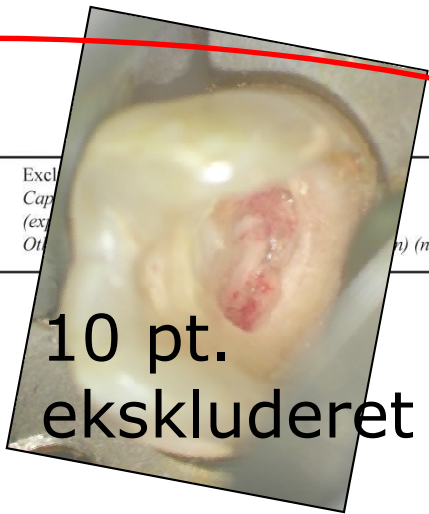
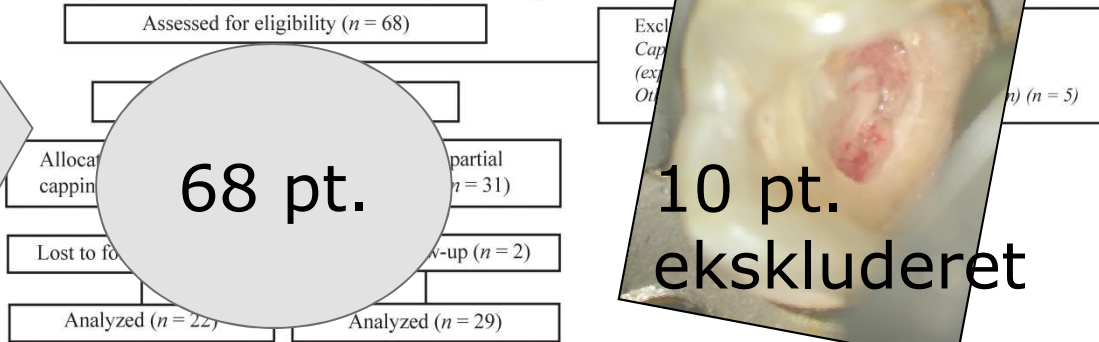
Favour direct complete



Stepwise excavation versus direct complete excavation



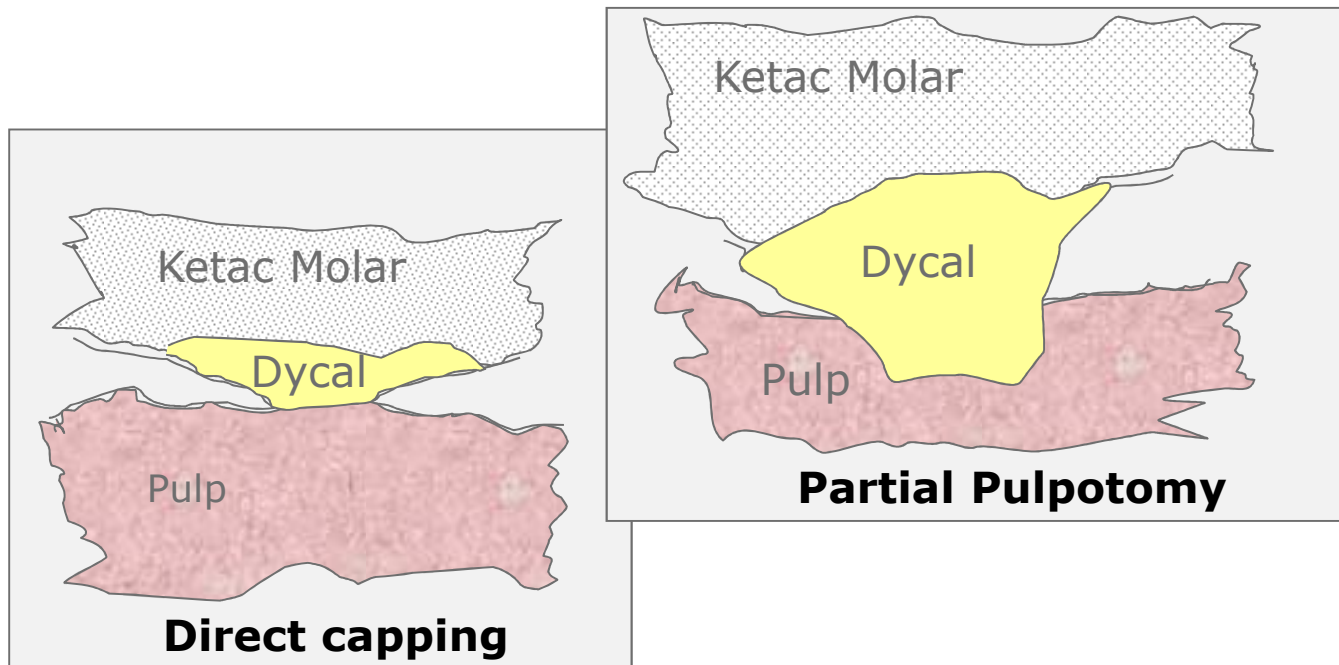
Direct pulp capping versus partial pulpotomy



10 pt.
ekskluderet

Flowchart showing the number of patients according to enrolment, allocation, follow-up and final number of analyzed patients in the two trials (source: Fig.1, **Study III**. Reprinted with permission from European Journal of Oral Sciences, Wiley-Blackwell, Oxford)

Direkte overkapning sammenlignet med partiell pulpotomi!



Resultater



Direkte overkapning versus partial pulpotomi



Kort sagt:

Partial pulpotomi

~ 1½-års pulpa overlevelses

34.5%

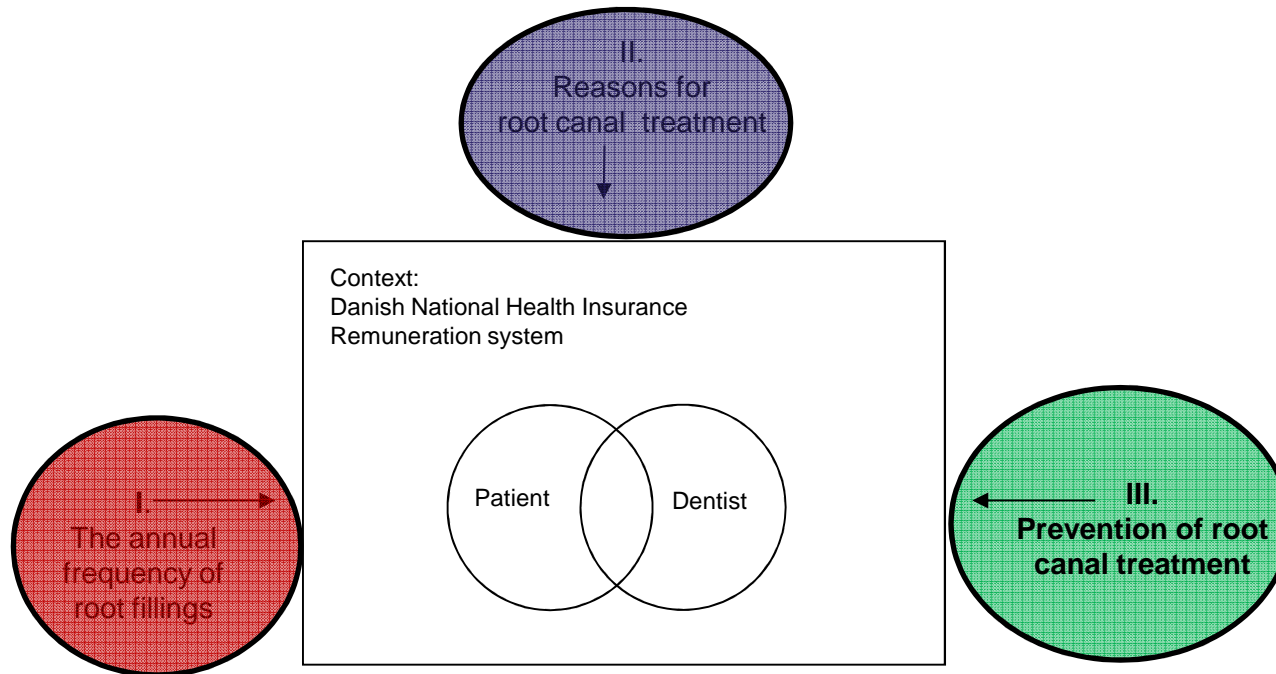
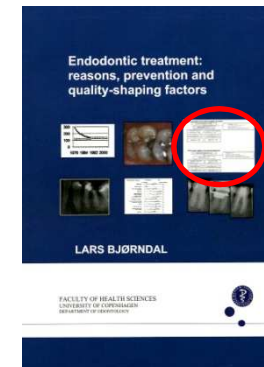
Direkte overkapning

~ 1½-års pulpa overlevelses

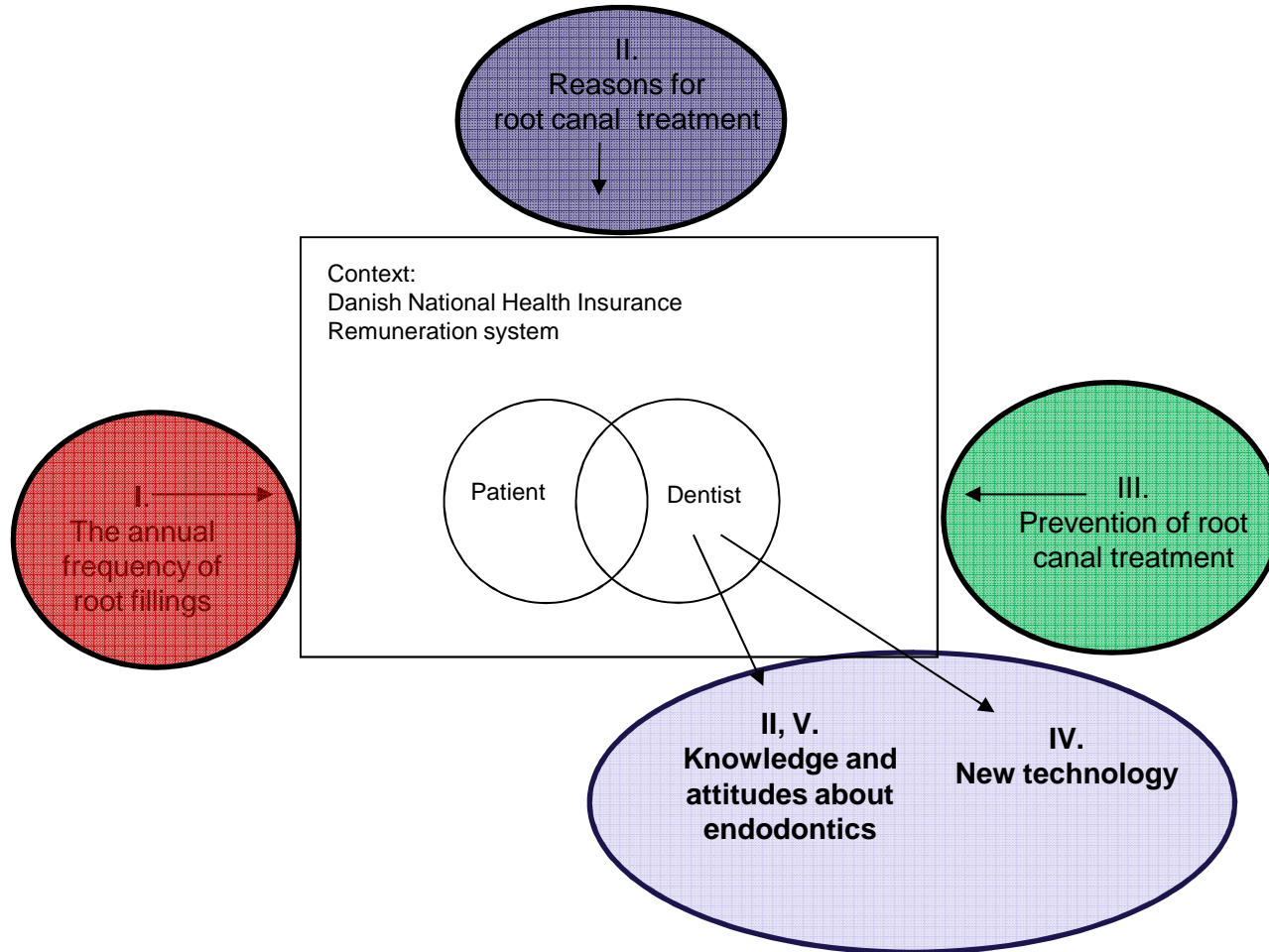
31.8 %

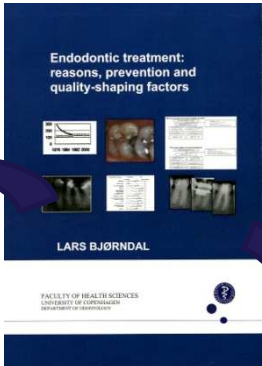


Forebyggelses-strategien er ikke en 100% 'success'



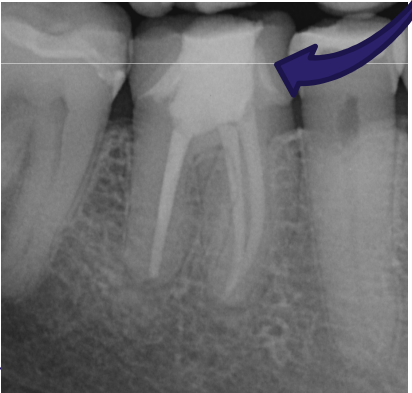
KVALITETS-SKABENDE FAKTORER STUDIE IV





De facto

Hvad vi kan opnå



1997, Sidiq
1998, De Moor
1999, Kirkevang et al.
2000, 2001, 2006
Boucher et al. 2002, Lupi-
Pegurier et al. 2002.,
Dugus et al. 2003, Loftus
et al. 2005, Ridell et al.
2006

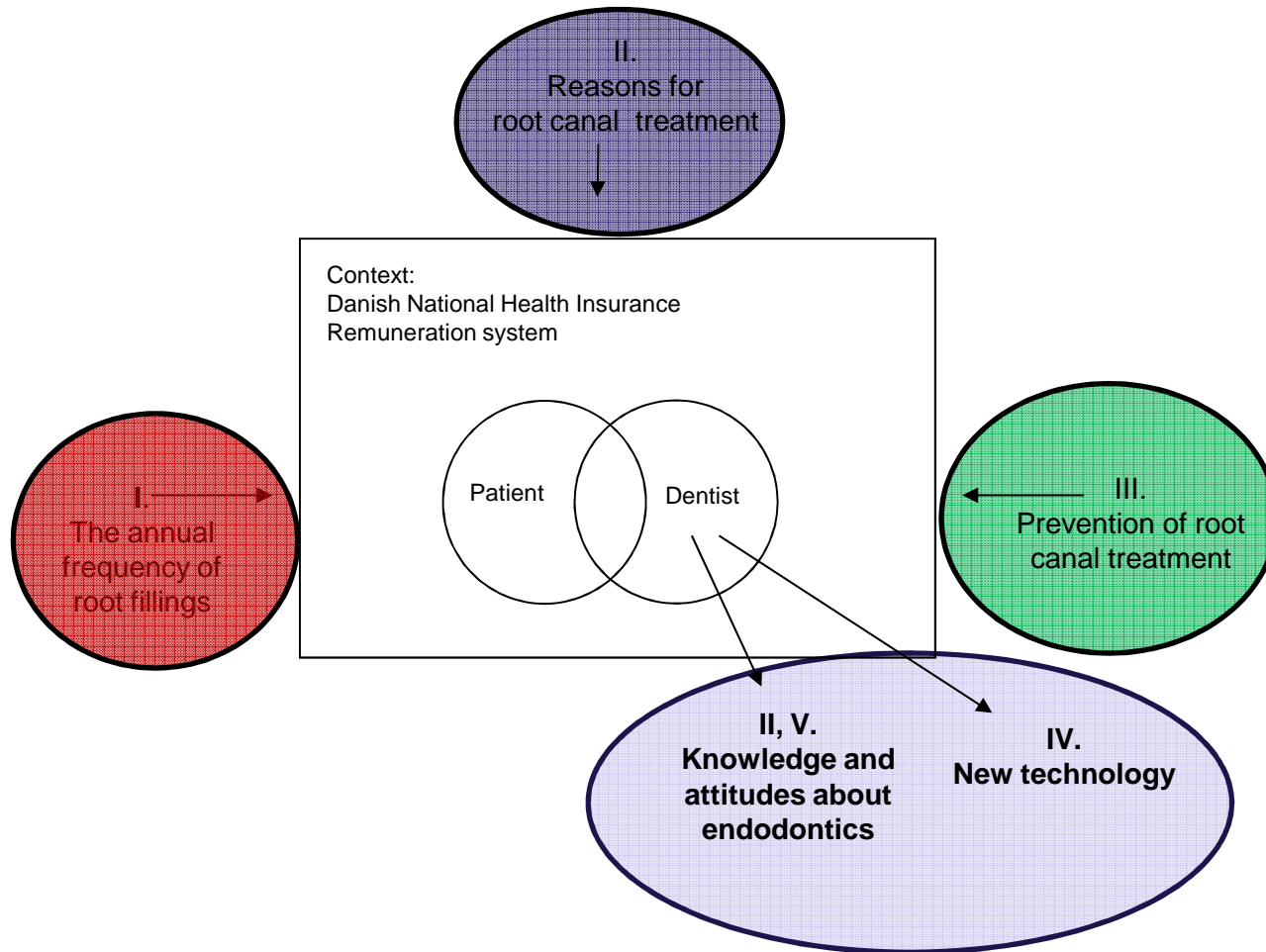
Strindberg et al. 1979,
Pettersson et al. 1979,
Kerekes & Tronstad 1979,
Sjögren et al. 1990.

Success

Gabet er stort



KVALITETS-SKABENDE FAKTORER STUDIE IV



Hypothesis IV:
Root fillings of suboptimal quality and root canal treatment procedure

Aim IV:
The rate of adoption of new endodontic advances amongst GDP



Lav adoptering af ny teknologi!

	Often (%)	Occasionally (%)	Never (%)
NiTi instrumentation	18	17	65
NiTi rotary	10	5	85
Electronic apex locator	23	19	67
Warm gutta-percha	19	16	65

The adoption rate of new endodontic technology amongst 692 GDPs. NiTi denotes nickel-titanium (Source: Table 1, **Study IV**. Reprinted with permission from International Endodontic Journal, Wiley-Blackwell, Oxford).



QUESTIONNAIRE CONCERNING THE ROOT CANAL TREATMENT PROCEDURE

1) Year of graduation: _____

2) Sex: Male Female

3) How many root canal treatments do you make weekly (approx.): _____

Name: _____

4) Frequency, control and of your dental office:

1. Regularly

2. Often

3. Sometimes

4. Rarely

5. Never

5) Procedure for selecting working length:

1. Radiograph

2. Radiograph and clinical

3. Clinical

4. Radiograph and clinical

6) Radiograph and clinical:

1. Radiograph

2. Clinical

3. Radiograph and clinical

7) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

8) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

9) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

10) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

11) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

12) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

13) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

14) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

15) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

16) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

17) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

18) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

19) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

5. More than four

20) How many teeth do you use to treatment a number:

1. One

2. Two

3. Three

4. Four

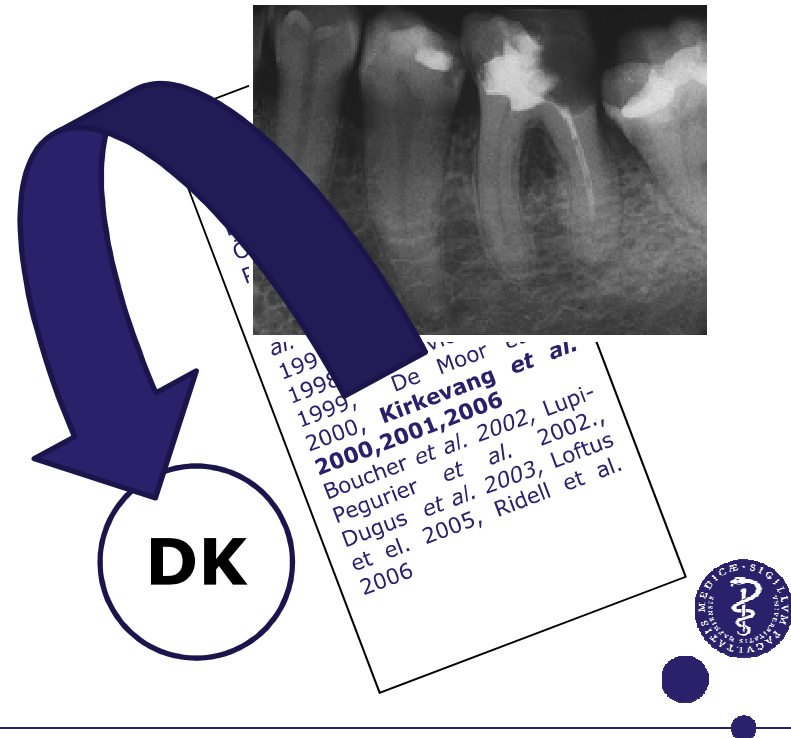
5. More than four

QUESTIONNAIRE BASED



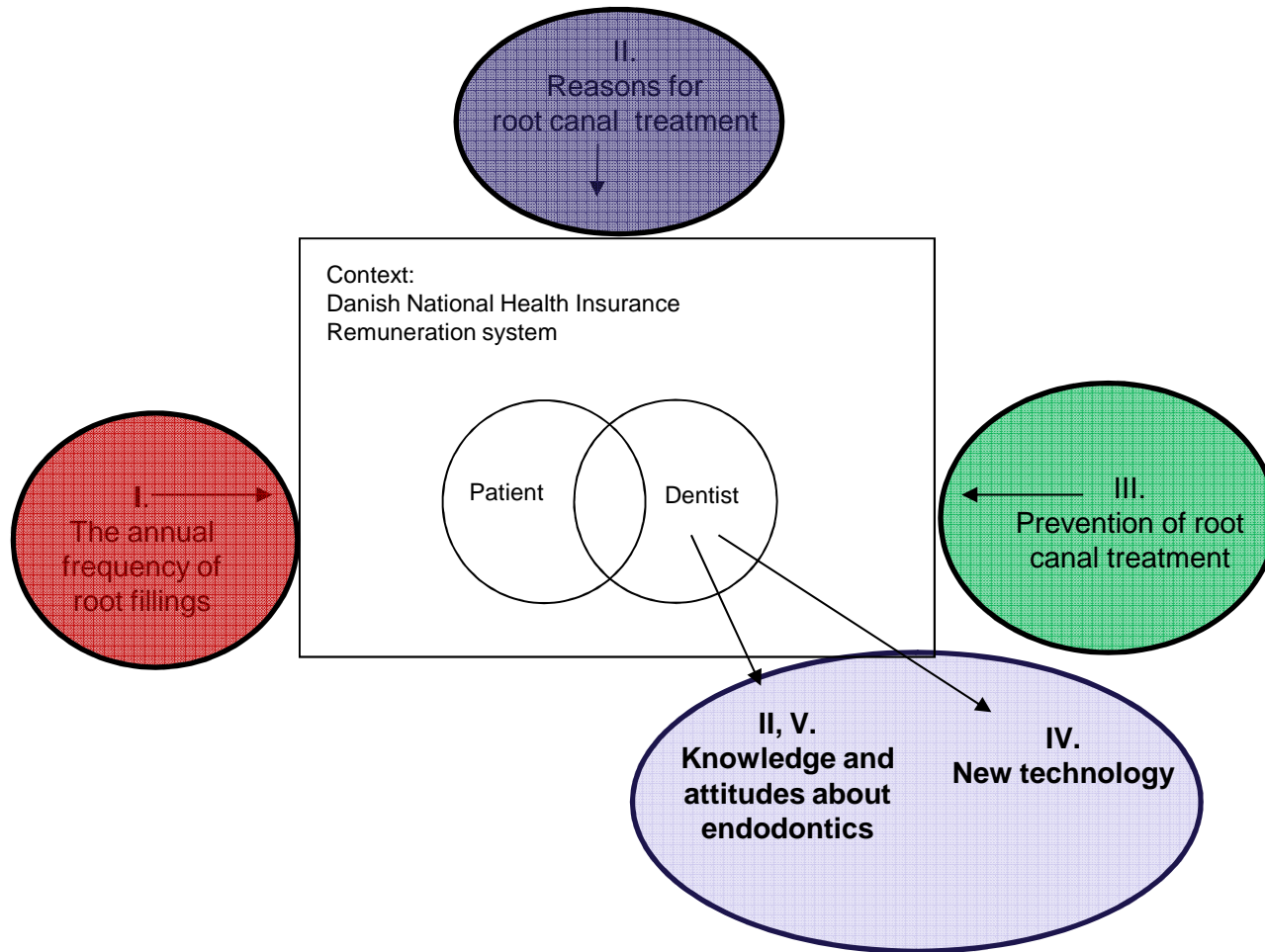
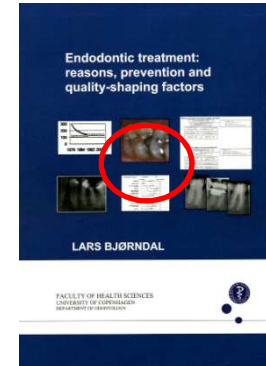
Udførelsen af rodkanalbehandlinger af sub-optimal kvalitet kan være associeret med:

- Anvendelsen af sub-optimal endodontisk rutine teknikker



KVALITETS-SKABENDE FAKTORER

STUDIE II og V

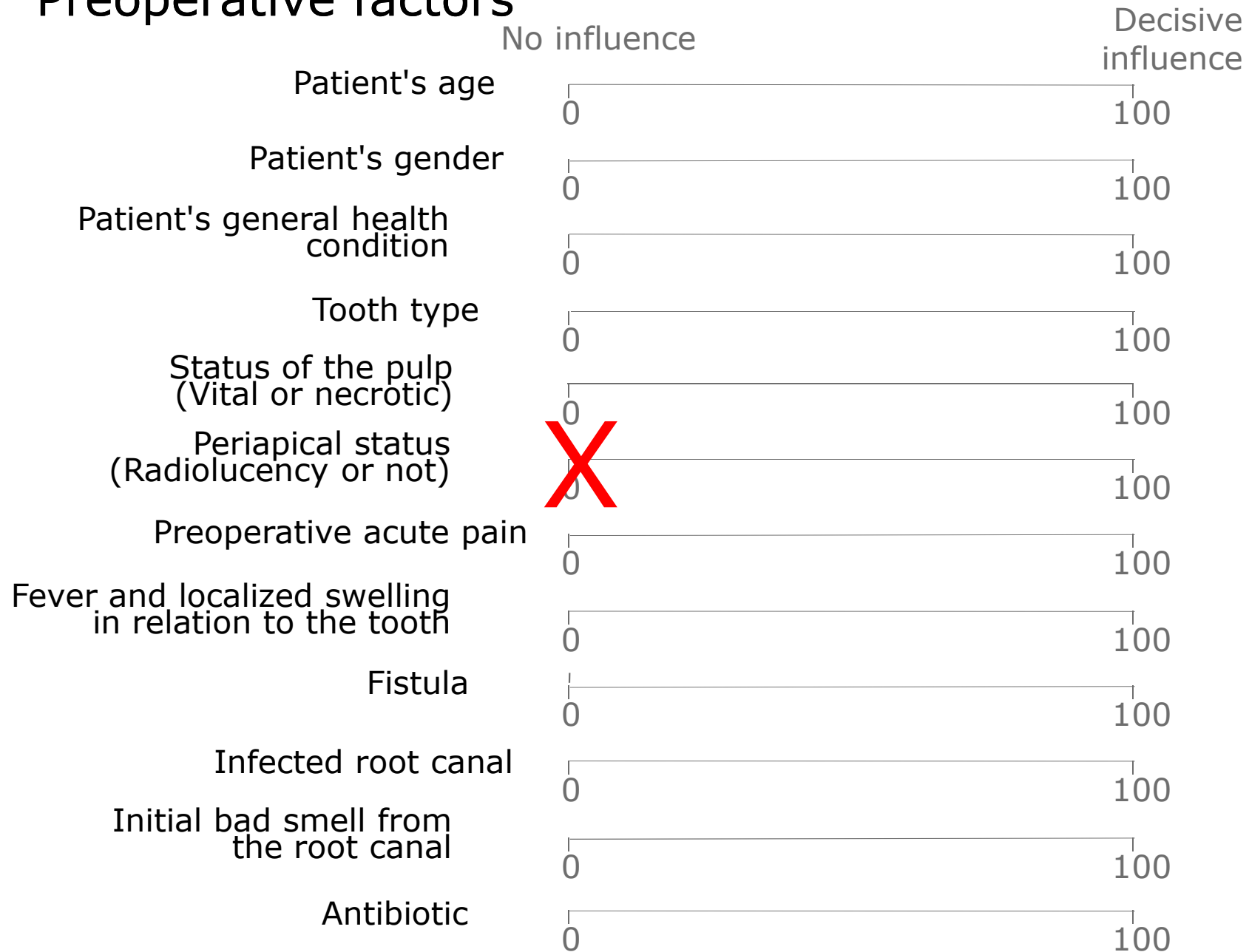


Hypothesis V:
Root fillings of suboptimal quality versus knowledge and GDP confidence

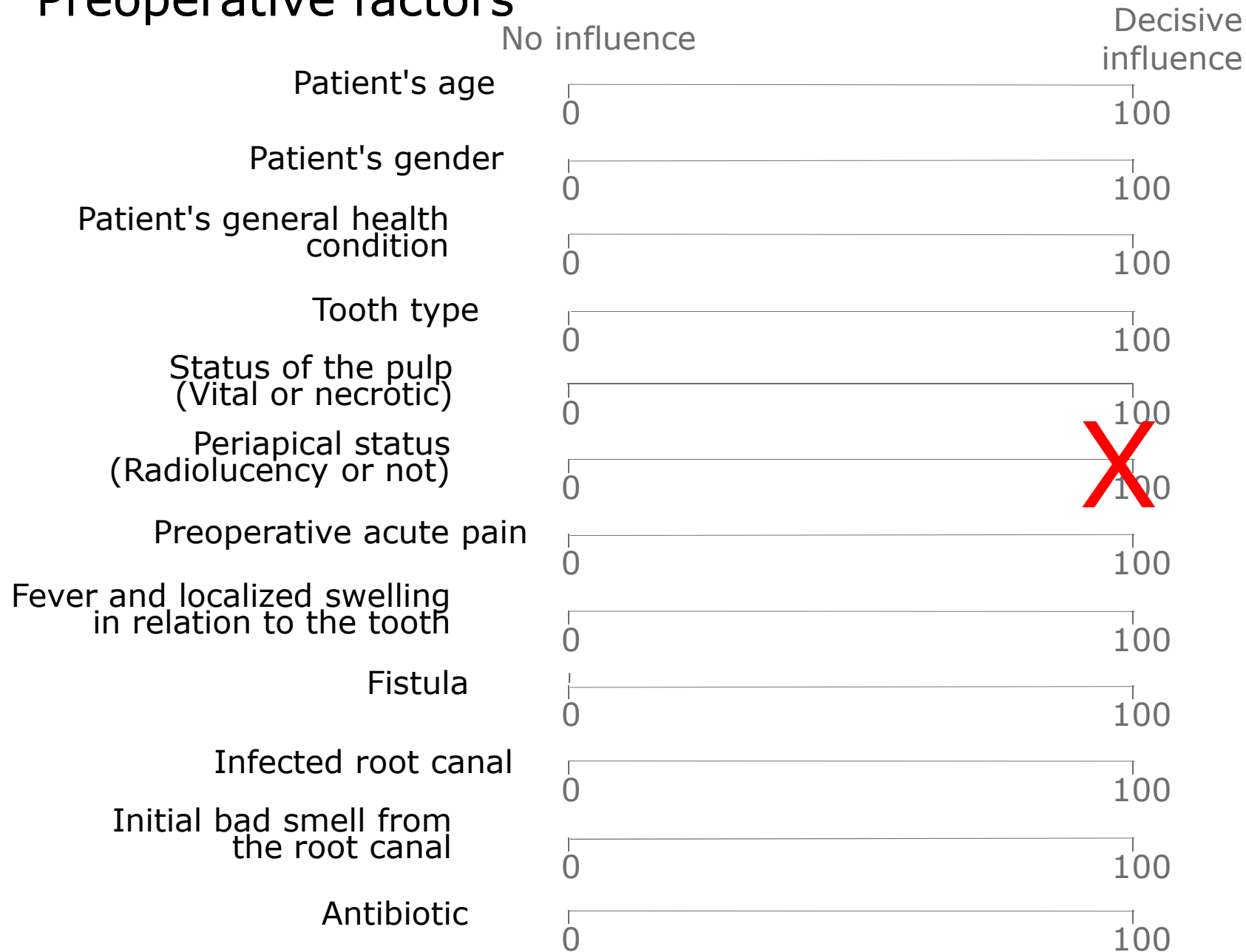
Aim V:
Explore GDP knowledge on prognostic factors and their self-awareness of endodontic topics



Preoperative factors



Preoperative factors



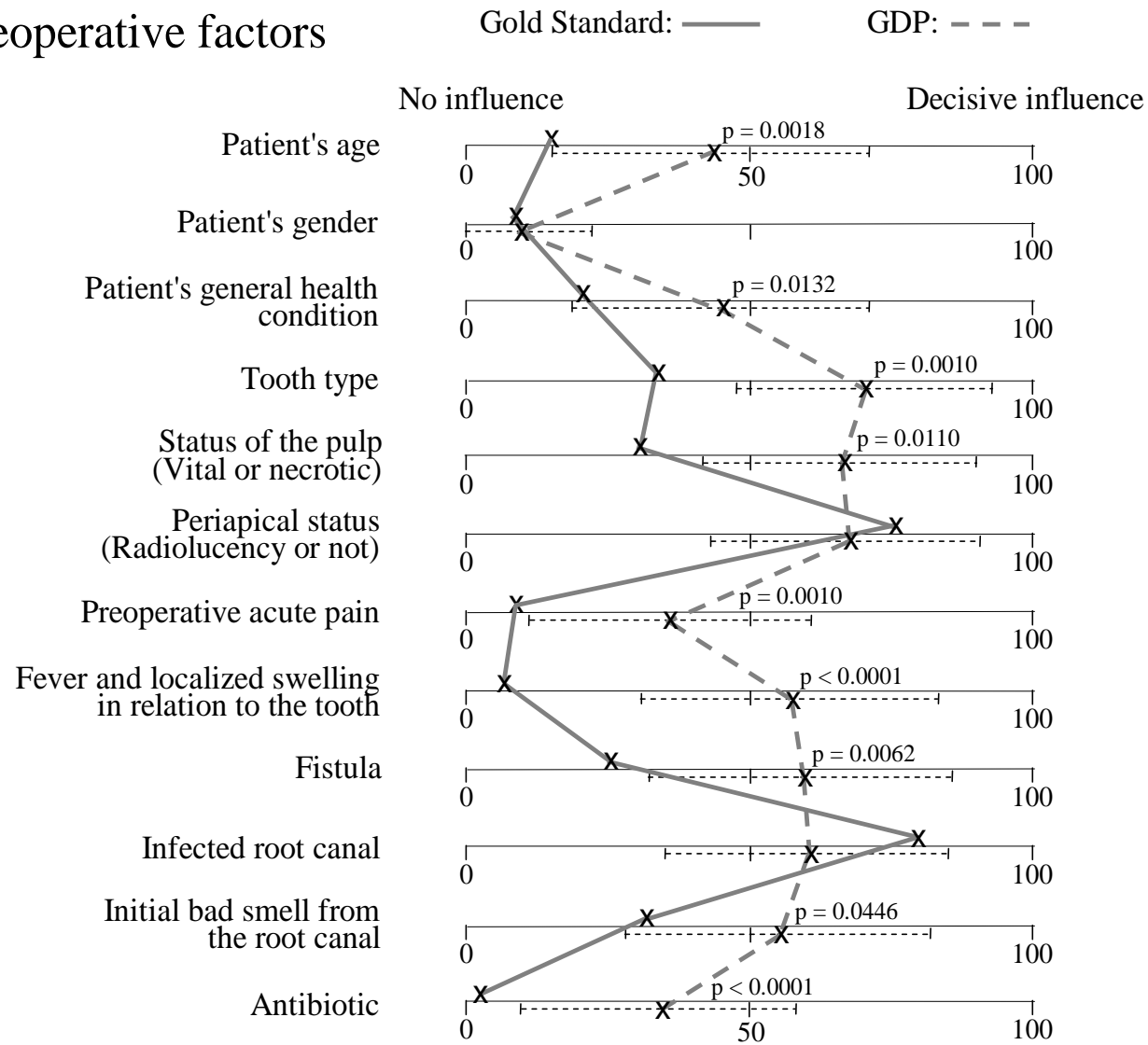
Alment praktiserende tandlægers svar versus 'Guld Standard'

7 endodontiske forsker har vurderet de samme 24 faktorer som kan påvirke det endodontiske resultat

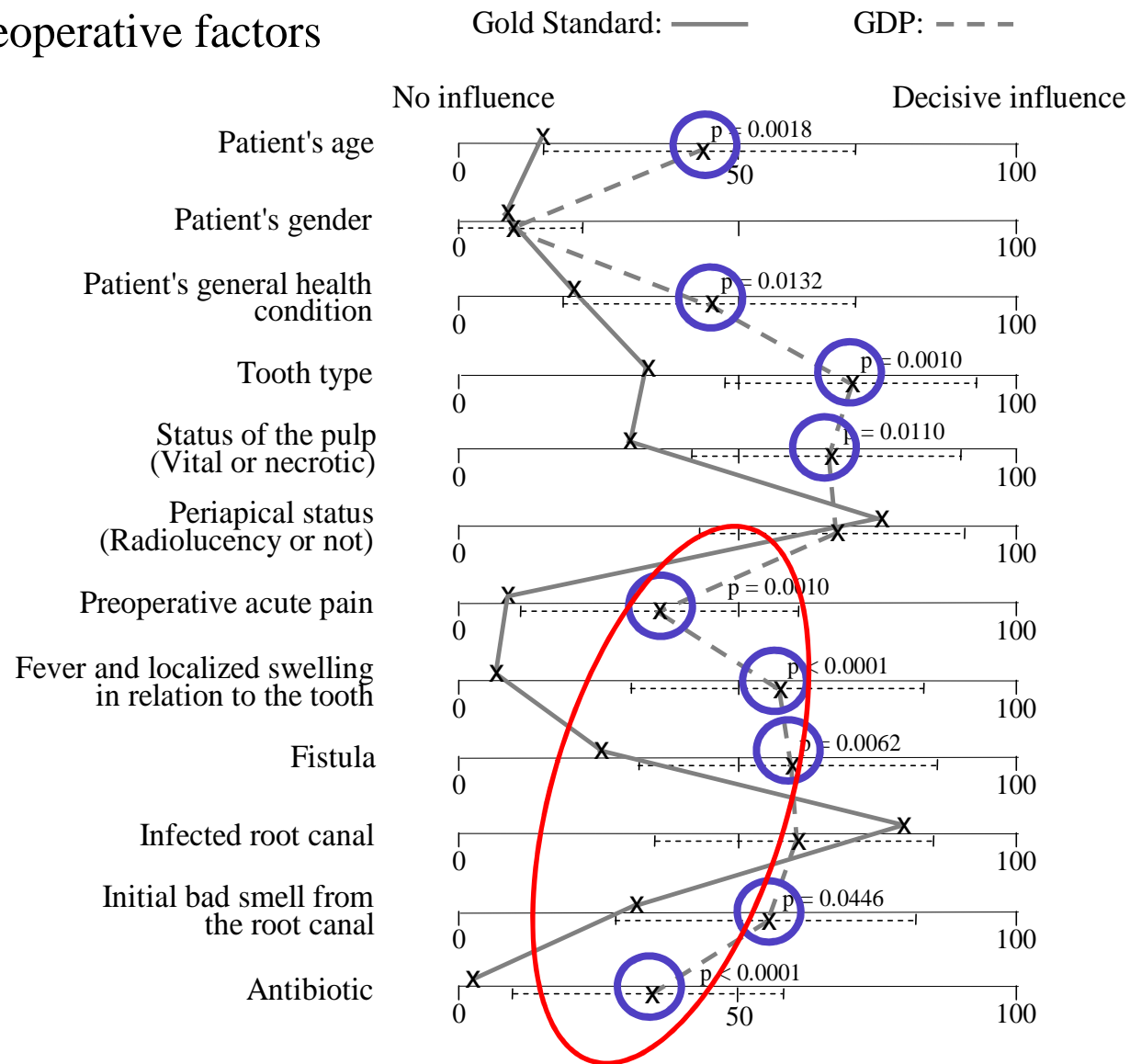
En konsensus opnås og defineres som en 'Guld standard'



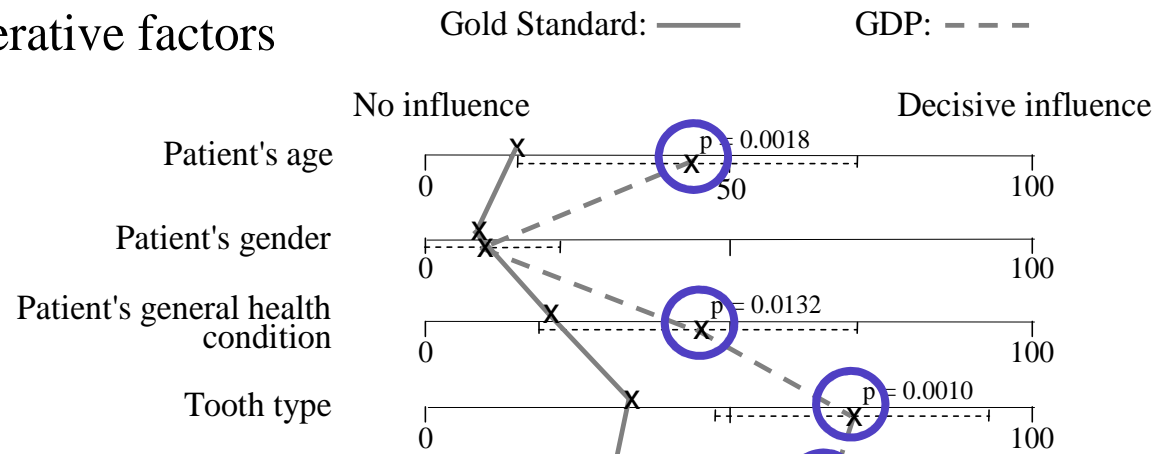
Preoperative factors



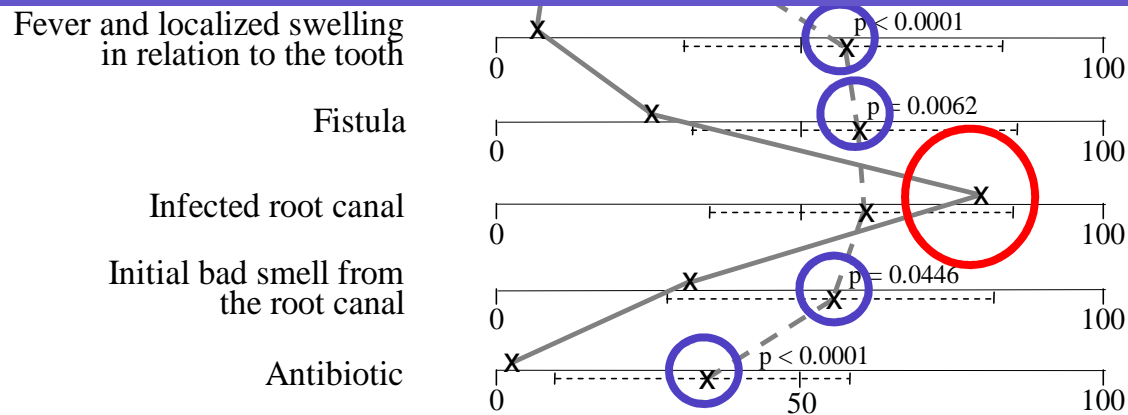
Preoperative factors



Preoperative factors



Tandlæger har meget fokus på akutte tegn på sygdom ift. prognose



Spørgeskema om tandlægenes selvopfattelse

Please respond to the questions below by marking the scale with a cross. A cross to the outer left (0) means that you consider the topic in focus to be very easy to carry out, and a cross to the outer right (100) means that it is very difficult to carry out.

- 12) Usually, I consider the access cavity aspect, within a root canal treatment of a mandibular molar, as being:

Very easy Very difficult
 0 100

- 13) Usually, I find that the negotiation of the root canal orifices within the root canal treatment of a mandibular molar as being:

Very easy Very difficult
 0 100

Tandlægerne har høj tiltro til deres egne praktisk kunnen!

- 15) Usually, I find the instrumentation within a root canal treatment of a mandibular molar as being:

Very easy Very difficult
 0 100

- 16) During a root canal treatment of mandibular molar I expect to use the following time to be use for the various treatmentsequences:

1. Access cavity: Provide the number of min.(approx): _____
2. Instrumentation: Provide the number of min.(approx): _____
3. Root filling: Provide the number of min.(approx): _____



Tandlægernes selvopfattelse af videns niveau på endodontiske central emner

Endodontic topics	Excellent			Satisfactory			Nonsatisfactory			No influence
	Total (%)	M	F	Total (%)	M	F	Total (%)	M	F	
Pulpal pathology	156 (34.9)	87	69	263 (58.8)	142	120 (1*)	28 (6.3)	7	21	23
Microbiology	39 (8.7)	14	25	225 (50.4)	127	97 (1*)	182 (40.8)	96	86	24
Clinical diagnostics	310 (68.9)	162	148	138 (30.7)	75	62 (1*)	2 (0.4)	1	1	20
Injecting local anesthesia	361 (80.0)	200	161	85 (18.8)	38	46	5 (1.1)	0	5	19
Emergency treatment	333 (74.8)	182	151	107 (24.0)	53	54	3 (1.1)	2	3	25
Root canal preparation procedure	182 (40.4)	109 (1*)	72	245 (54.3)	115	130	24 (5.3)	14	10	19
Root filling procedure	151 (33.5)	95 (1*)	55	273 (60.5)	135	138	27 (6.0)	19	8	19
Prognostic factors	114 (25.7)	70	44	296 (66.7)	150	145 (1*)	34 (7.7)	15	19	26

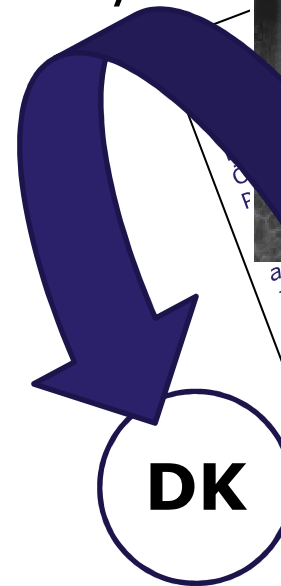
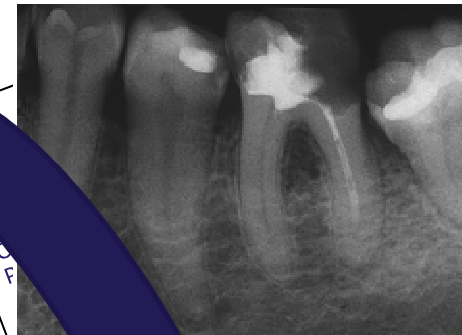
M, male; F, female.

*Number of responds not specified in relation to gender.

Tandlægerne har en høj selvopfattelse af deres niveau af endodontisk viden og færdigheder!

Udførelsen af rodkanalbehandlinger af sub-optimal kvalitet kan være associeret med:

- Anvendelse af sub-optimal endodontisk rutine procedurer
- Mangelfuld viden om faktorer vigtige for udfald af behandlings resultatet
- En urealistisk høj selvtillid/ tiltro til egen kunnen

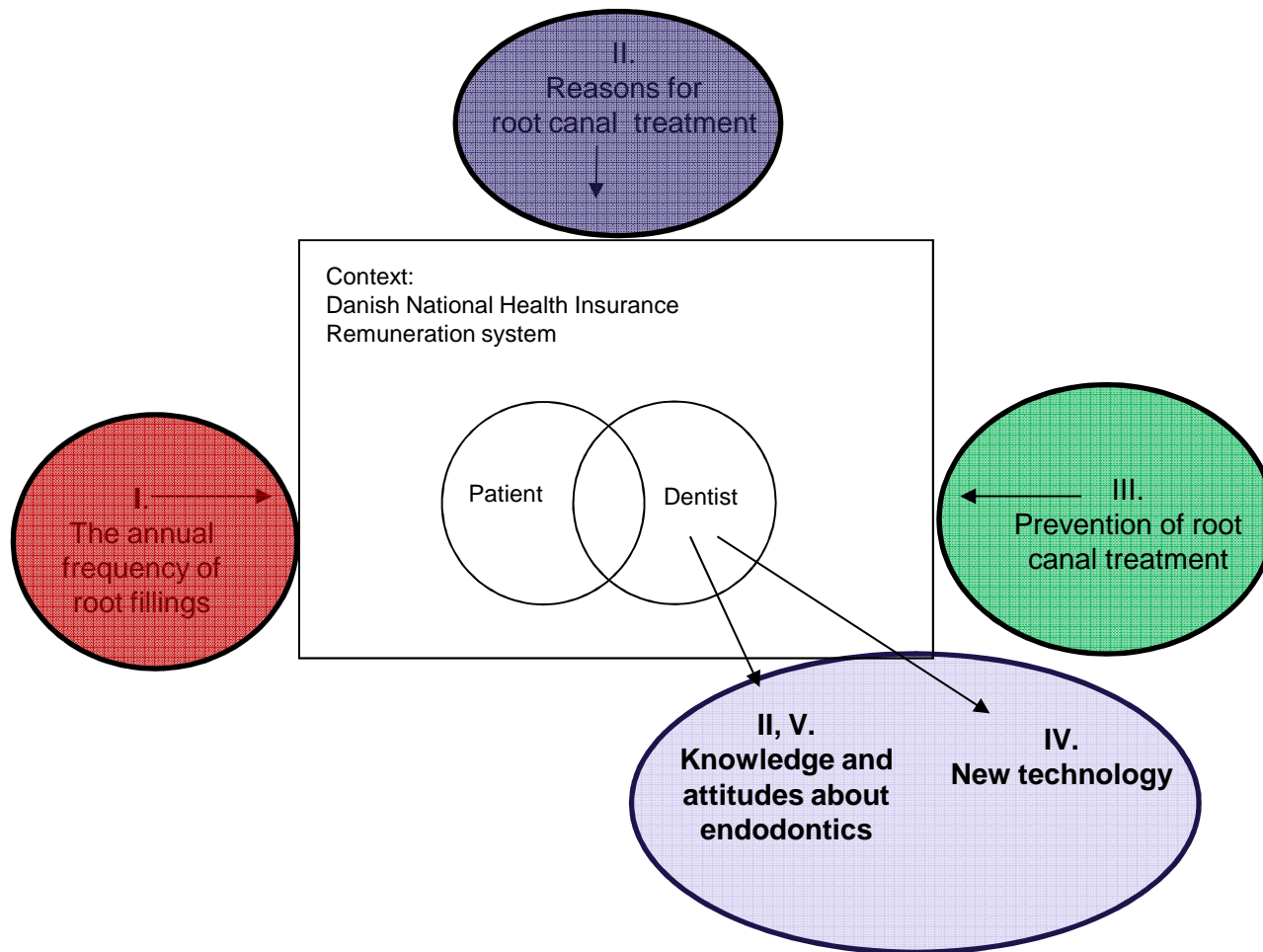
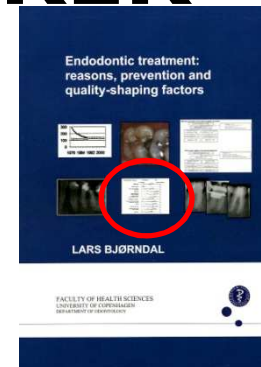


DK

al. 1998, De Moor et al. 1999, Kirkevang et al. 2000, 2001, 2006 Boucher et al. 2002, Lupi-Pegurier et al. 2002., Dugus et al. 2003, Loftus et al. 2005, Ridell et al. 2006

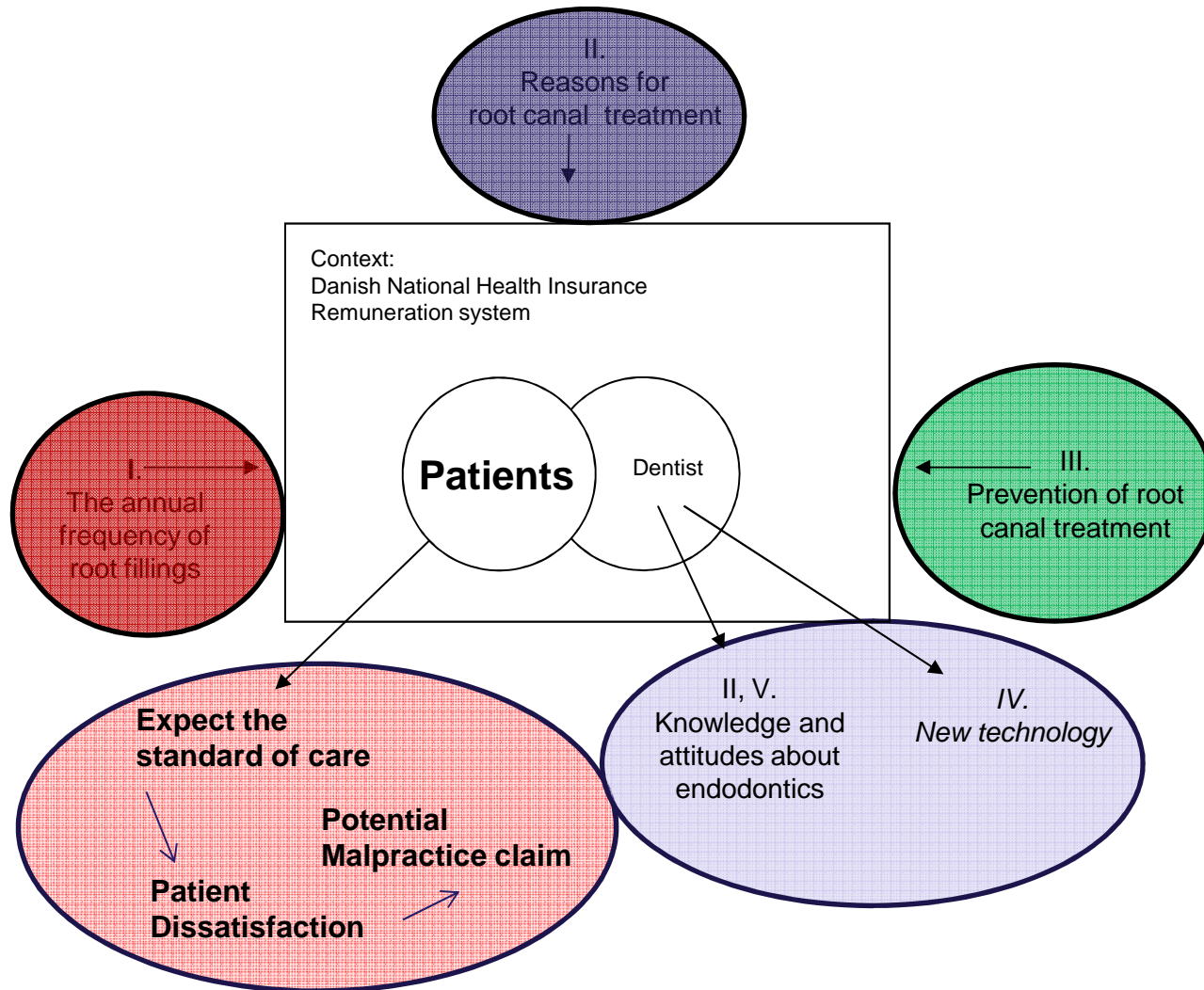
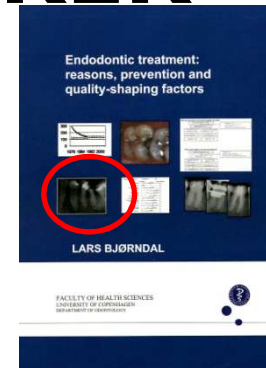


KVALITETS-SKABENDE FAKTORER



KVALITETS-SKABENDE FAKTORER

STUDIE VI



Hypothesis V:
Root fillings of suboptimal quality is reflected in claims

Aim V:
To study reasons for endodontic claims



Endodontisk klager

	DCB decisions				Total <i>n</i> (%)
	Verdict of malpractice	No verdict of malpractice	Settlement	Rejection	
Technical complications or incorrect treatment	55	74	5	3	137 (28.4)
Other reasons	56	26	3	1	86 (17.8)
Periapical pathology	56	26	3	1	86 (17.8)
Wound healing	56	26	3	1	86 (17.8)
Legal procedure	56	26	3	1	86 (17.8)
Non-odontogenic	56	26	3	1	86 (17.8)
Suboptimal rod fyldning					32%
Total	179	213	80	10	482 (100)

Endodontic claims and Dental Complaint Board (DCB) decisions 1995-2002. (Source: Table 3, **Study VI**. Reprinted with permission from International Endodontic Journal, Wiley-Blackwell, Oxford).



Endodontisk klager kan ses som toppen af isbjerget

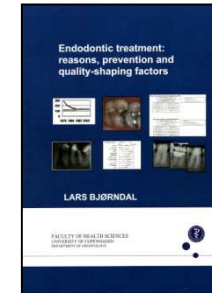


.....afspejlende de kroniske problemer under overfladen



Samlet date vedr. kofferdam fra afhandling

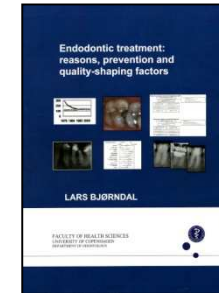
- **At lave et aseptisk arbejdsfelt blev af alment praktiserende tandlæger anset som den mest vanskelige procedure (mulig årsag til manglende anvendelse)**
- **Mikrobiologi emnet (Tandlægerne havde mindst viden om mikrobiologi – mulig årsag til manglende forståelse for anvendelse af et aseptisk arbejdsfelt)**



LØSNING
EFTERUDD. HANDS-ON!



Samlet data vedr. kofferdam og privat praktiserende tdl.



- **Plus minus smerter**
(Succes og prognose blev primært ligestillet med smertefrihed, hvorved den kausale bakterielle rolle for apikal parodontitis var mere uklart prioriteret)

- **Teknologi 'cluster'**
(Hvis tandlæger bruger meget teknologi (apexfinder, roterende Instrumenter osv.) så anvendes kofferdam hyppigere)

- **Tandlæger opfatter ikke at der er et problem**
(Hvis en rodb. ikke er forbundet med smerter så accepteres en apikal opklaring)



I Klagenævns materialet (fra 1994-2004) blev der aldrig nævnt noget om anvendelse eller ikke anvendelse af Kofferdam!

Noget tyder på at de guidelines der udgår fra Universiteterne i både København og Aarhus ikke var fuldt implementeret/indarbejdet i klagesagssystemet i ovennævnte periode!



Udførelsen af rodbehandlinger af sub-optimal kvalitet kan være associeret med:

- Anvendelse af sub-optimal endodontisk rutine procedurer
 - Mangelfuld viden om faktorer vigtige for udfald af behandlings resultatet
 - En urealistisk høj selvtillid/ tiltro til egen kunnen
-
- **Patienters utilfredshed som dokumenteret i klagesager**



KONKLUSIONER

Iil trods for en markant nedgang i caries:

- Endodontisk behandling er en stigende del af tandlægenes aktivitet og det er blevet mere og mere komplicerede behandlinger
- Caries i vitale tænder – hoved årsag til rodbehandling

Som en endodontisk forebyggende strategi:

- Gradvis ekskavering viser en signifikant højere succes rate
- Ingen forskel efter kontrol mellem to overkapnings - procedurer og en meget lav succes observeres



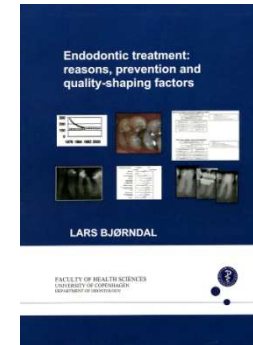
KONKLUSIONER

Potentielle faktorer der influerer rodbehandlings kvalitet blandt alment praktiserende tandlæger kunne være:

- Lav tilegnelse af ny teknologi, herunder anvendelsen af kofferdam
- Forskellig fokus på hvad der bestemmer prognose for endodontisk behandling
- En måske urealistisk høj tiltro til egen kunnen hvad angår udførelse af rodbehandlinger
- Et klage system og dens bedømmelse af endodontiske sager



Fremtidige veje at følge!



De facto

Hvad vi kan opnå

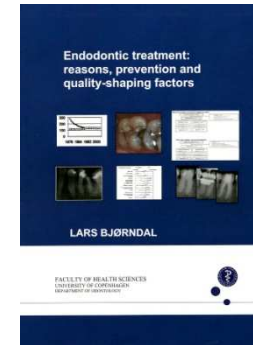


Success

Gabet er stort



Fremtidige veje at følge!



De facto

Hvad vi kan opnå



**Reducer
antal af
endodontisk
behandlinger**

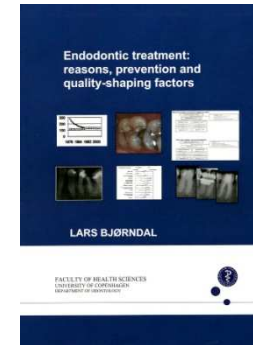
Success



Gabet er stort



Future ways to proceed!



De facto

Hvad vi kan opnå



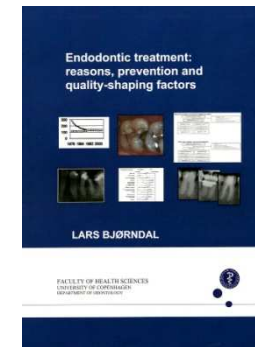
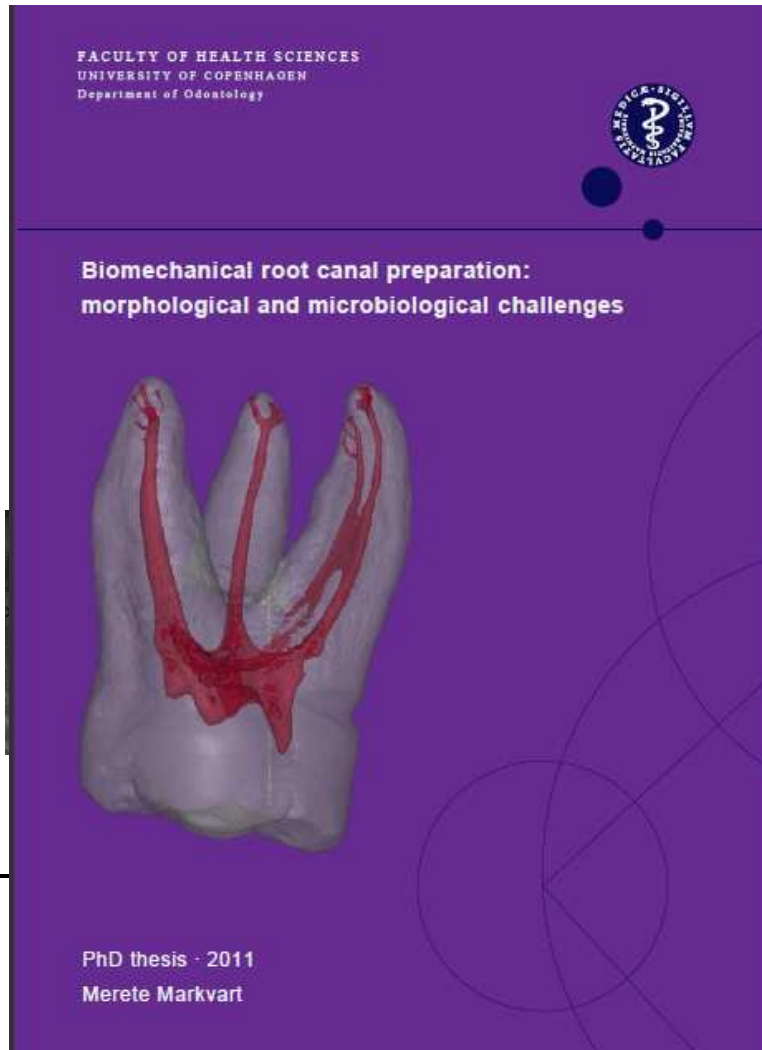
TdI'ens evne til at ændre rutiner?



Success



Mere POST GRADUATE viden vil også påvirke!



Måske er tiden snart moden til et Endodontisk Speciale i Dk



Success

Gabet er stort



Acknowledgements:

Claes Reit

The Danish Dental Association and The Copenhagen Dental Association

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Copenhagen University

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Dentsply, DeTrey Dentsply, and Gedr. Brassler.





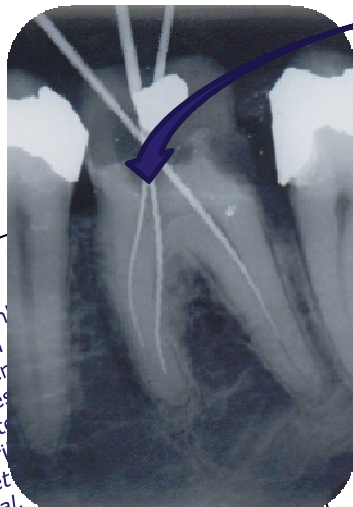
Alt andet lige
giver kofferdam
et bedre
behandlings -
forløb eller hva' ?

..... HVAD ER DET NU LIGE MED KOFFERDAM PROBLEMATIKKEN ?



Der er et stort gab - mellem hvad der kan lade sig gøre og det der kan dokumenteres på populations data - vi ved kofferdam bruges af få i privat praksis - Er rutinemæssigt brug af kofferdam således en faktor der kan mindske dette gab ?

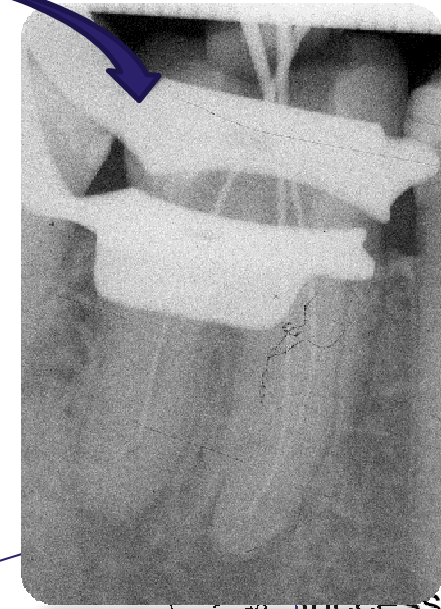
De facto



Endodontic treatment: reasons, prevention and quality-shaping factors

LARS BJØRNDAL
FACUL UNIVER DEPART

Hvad man kan opnå



Bergren
Allard
Ecker
Ödes
Pet
Eri
et
al.
1997, Sida
1998, De Moo
1999, Kirkevang et al.
2000, 2001, 2006
Boucher et al. 2002, Lupi-
Pegurier et al. 2002.,
Dugus et al. 2003, Loftus
et al. 2005, Ridell et al.
2006

Strindberg
Petersson et al.
Kerkes & Tronstad 1979, success
Sjögren et al. 1990.

Gabet er stort!



Viden om årsag til apikal parodontitis vigtigt!



Kobling mellem bakterier og udvikling af parodontitis apicalis

Observationer i dyr eksperimenter

- Det klassiske rotte studie
(Kakehashi, Stanley & Fitzgerald 1965)
- Abe studierne
(Möller, Fabricius, Dahlén, Öhlman & Heyden 1981)



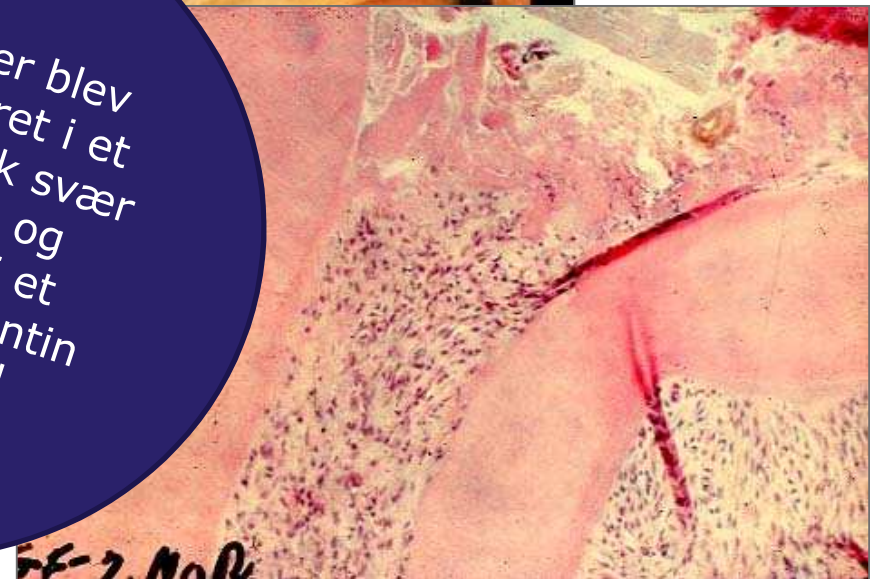
Det klassiske rotte studie (Kakehashi, Stanley & Fitzgerald 1965)



Gruppe 1:
'Normalt miljø'



Alle rotter der blev pulpa perforeret i et normalt miljø fik svær inflammation og nekrose. Alle i et sterilt miljø fik dentin bro svarende til perforationerne.



Gruppe 2:
Sterilt miljø



'Aberne' deles i to grupper:



Alle non-inficerede kanaler er fortsat sterile efter 6-7 mdr., og der ses ingen apikal opklaring

Kontrolleres klinisk, mikrobiologisk radiologisk og histologisk!

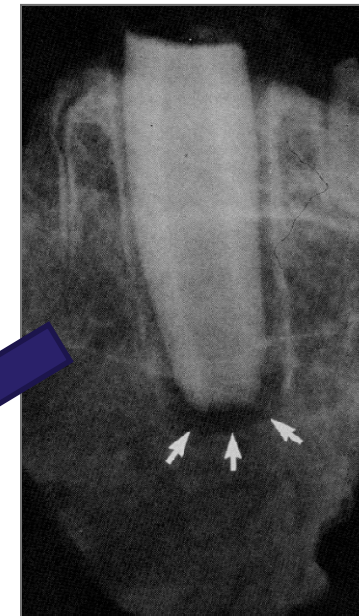
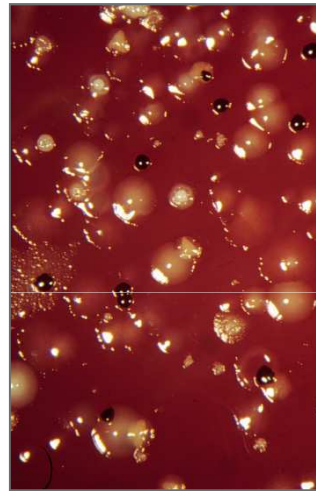


Alle de bakterie inficerede rodkanaler viser histologisk kraftig inflammatorisk reaktion i det periapikale område



De bakterie inficerede rodkanaler - radiologiske fund:

**Infektion fra
oral flora**
(ved at lade
tand stå
åben)



**Størstedelen (90%) af tænderne
med bakterie- inficerede rodkanaler
viser apikal opklaring på rtg-billedet.**

Kobling mellem bakterier og udvikling af parodontitis apicalis

Observationer i dyr eksperimenter

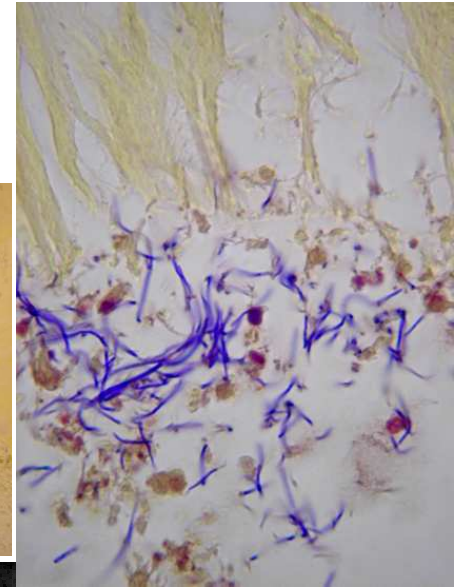
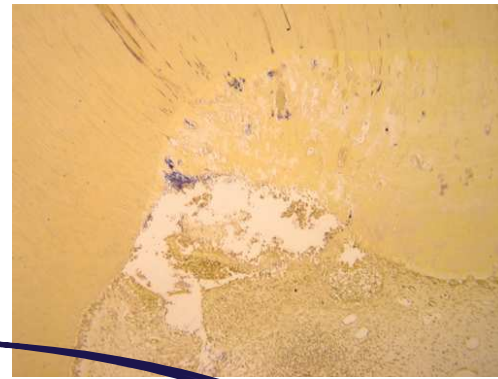
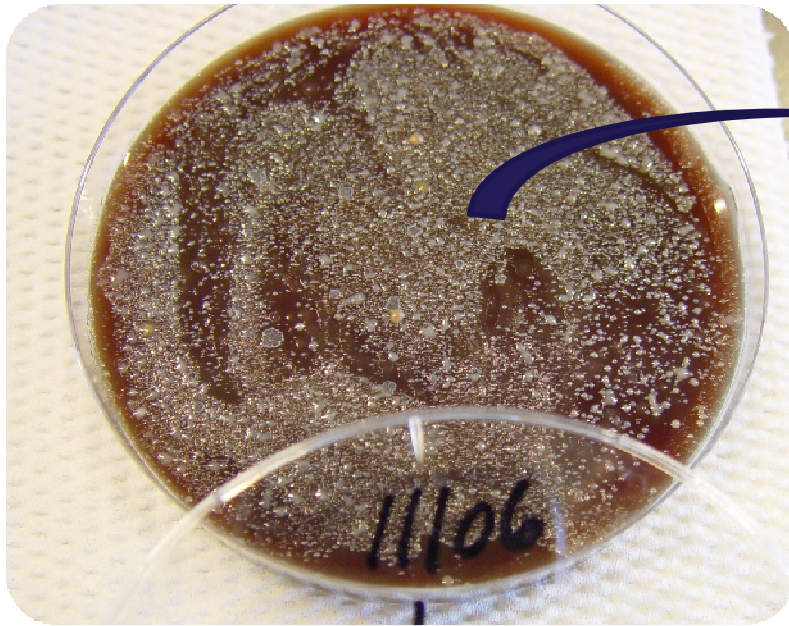
- Det klassiske rotte studie
(Takehashi, Stanley & Fitzgerald 1965)
- Abe studierne
(Möller, Fabricius, Dahlén, Öhlman & Heyden 1981)

Observationer i human studier

- Mikrobiologi i traumatiseret tænder (Bergenholtz 1974)
- Mikrobiologi i rodkanaler og periapikalt væv (Möller 1966)
- Mikrobiologisk undersøgelser i nekrotisk pulpa
(Sundqvist 1976)



Det videnskabelige grundlag



Courtesy Dr. Ricucci





- Kort sagt kender vi i dag årsag og udvikling til en apikal parodontitis - og derfor er det relevant at mindske kontaminering på alle de områder hvor det kan lade sig gøre - også når det gælder den vitale pulpa!



- I det følgende ses en række tiltag der skal mindske kontaminering og hvor anvendelse af afvasket kofferdam er central! Bemærk oplukningskaviteten prioriteres inden, idet man herved ikke mindsker overblik og undgår risiko for forkert oplukningsretning samt eksemplevis perforationer!

De 10 befalinger ved forebyggelse af endodontisk infektion:

1. Fjern plaque og tandsten på aktuelle tand og de 2 nabo tænder før kofferdam og færdiggør oplukningskavitet.
2. Isoler med kofferdam fordi det:
 - Muliggør afvaskning af arbejdsfeltet.
 - Det øger synligheden/kontrasten i arbejdsfeltet
 - Forhindrer tab af instrumenter i hals
 - Beskytter mundslimhinden for de medikamenter der anvendes
3. Afvask arbejdsfelt med desinfektionsmiddel.
4. Ekskaver rester af caries og fjern insuf. fyldning, idet residual bakteriere kan kontaminere rodkanalen
5. Arbejd med sterile instrumenter
6. Undgå berøring med den del der introduceres i kanalen. (dvs. pincet når bor skal monteres m.m).
7. Sterile paperpoints
8. Sterile beholder til medikamenter
9. Husk desinfektion af guttaperka i NaOCl (1 min)
10. Koronal forsegling (prov. Fyldn. lag tykkelse minimum 5 mm).

Treatment of Endodontic Infections, Siqueira JF, 2011, Quintessence Publ.



De 10 befalinger ved forebyggelse af endodontisk infektion:

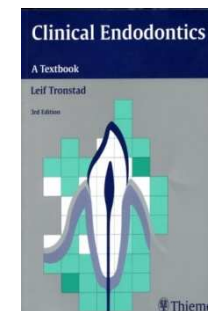
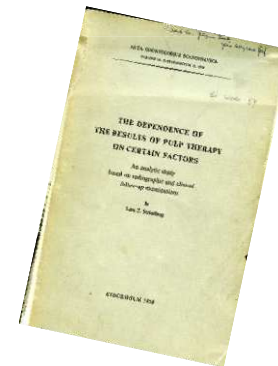
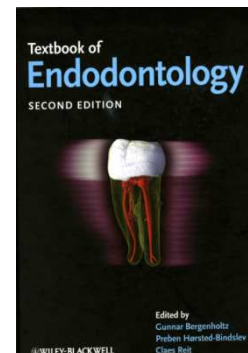
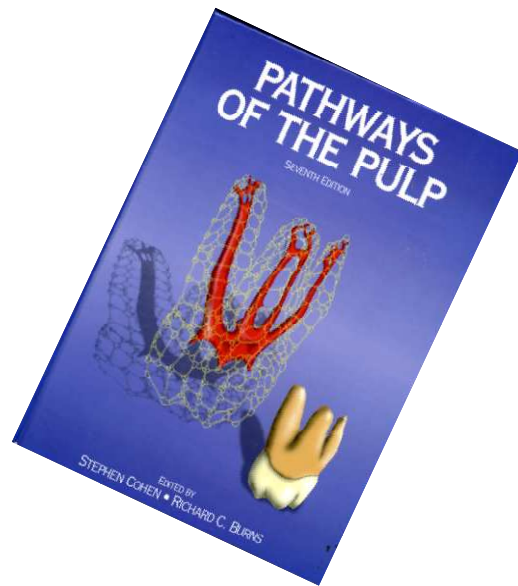
1. Fjern plaque og tandsten på aktuelle tand og de 2 nabo tænder før kofferdam, og færdiggør oplukningskavitet.
2. **Isoler med kofferdam fordi det:**
 - **Muliggør afvaskning af arbejdsfeltet.**
 - **Det øger synligheden/kontrasten i arbejdsfeltet**
 - **Forhindrer tab af instrumenter i hals**
 - **Beskytter mundslimhinden for de medikamenter der anvendes**
3. Afvask arbejdsfelt med desinfektionsmiddel.
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Behandlingsresultaterne når aseptisk arbejdsfelt med kofferdam er anvendt?

- For pulpektomier er de generelt høje 90-95%.
- For tænder med apikal parodontitis omkring 10-15% lavere.



Hvad er behandlingsresultaterne når der **ikke** rutinemæssigt er anvendt kofferdam?

- Data findes ikke direkte!

**MEN.....DER ER
NOGLE INDIKATIONER
PÅ HVORDAN DET GÅR!**



Success rate of endodontic treatment of teeth with vital and nonvital pulps. A meta-analysis

Kojima et al. 2004

- Inkluderer primært studier hvor der er anvendt kofferdam og finder en samlet akkumuleret succes rate på 82% for rodbehandlede tænder uden apikal opklaring og 71.5% for tænder med apikal opklaringer

.....men et studie inkluderes hvor man har en mærkbar lavere succes rate !



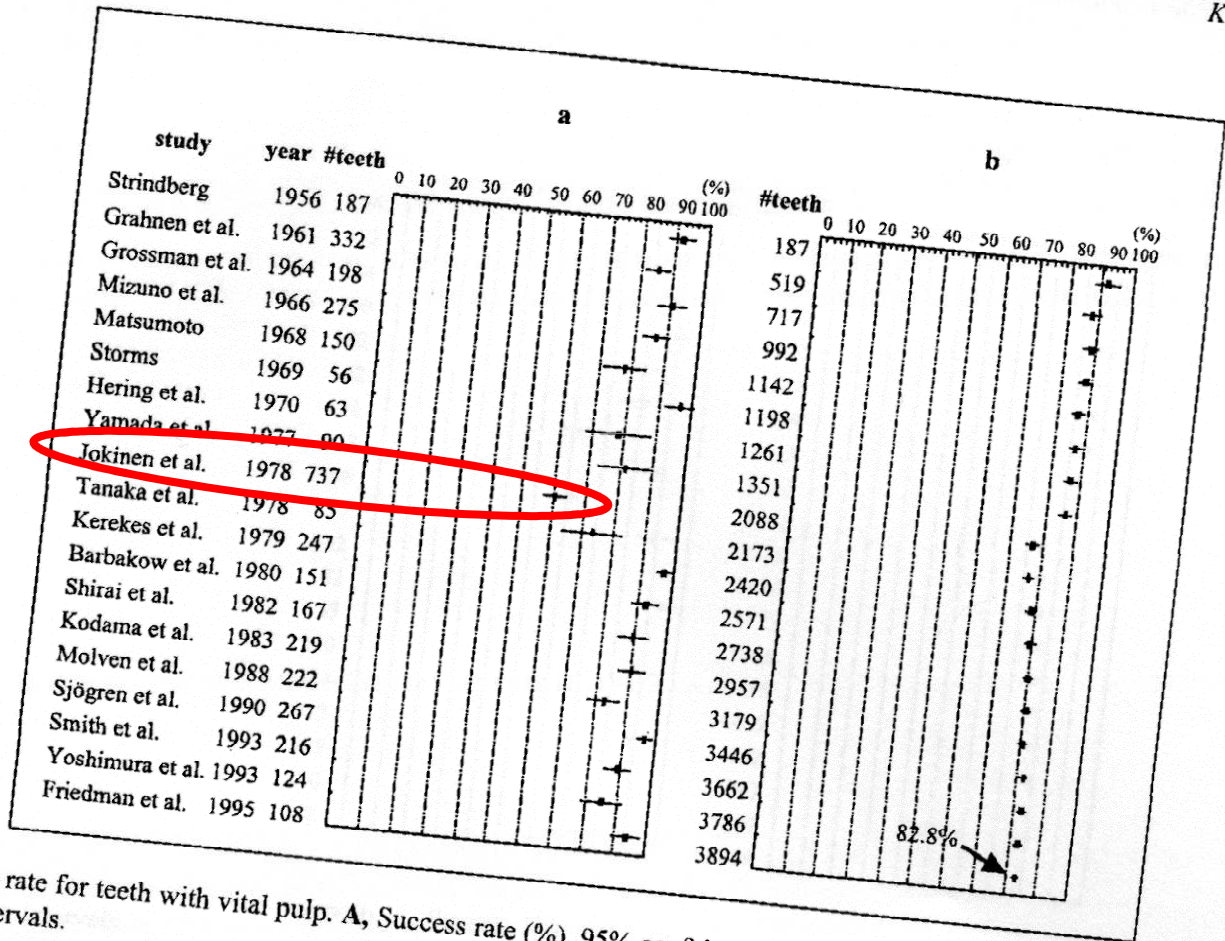


Fig 1. Success rate for teeth with vital pulp. A, Success rate (%), 95% confidence intervals. B, Cumulative success rate (%), 95% confidence intervals.



Clinical and radiographic study of pulpectomy and root canal therapy Jokinen et al. 1978

- Succes raten er 71% uden apikal opklaring
- Succes raten er 55% med apikal opklaring
-
- **I dette studie anvendes kofferdam ikke rutinemæssigt (~50%)**

Status af observationelle studier med ukontrolleret anvendelse af kofferdam!



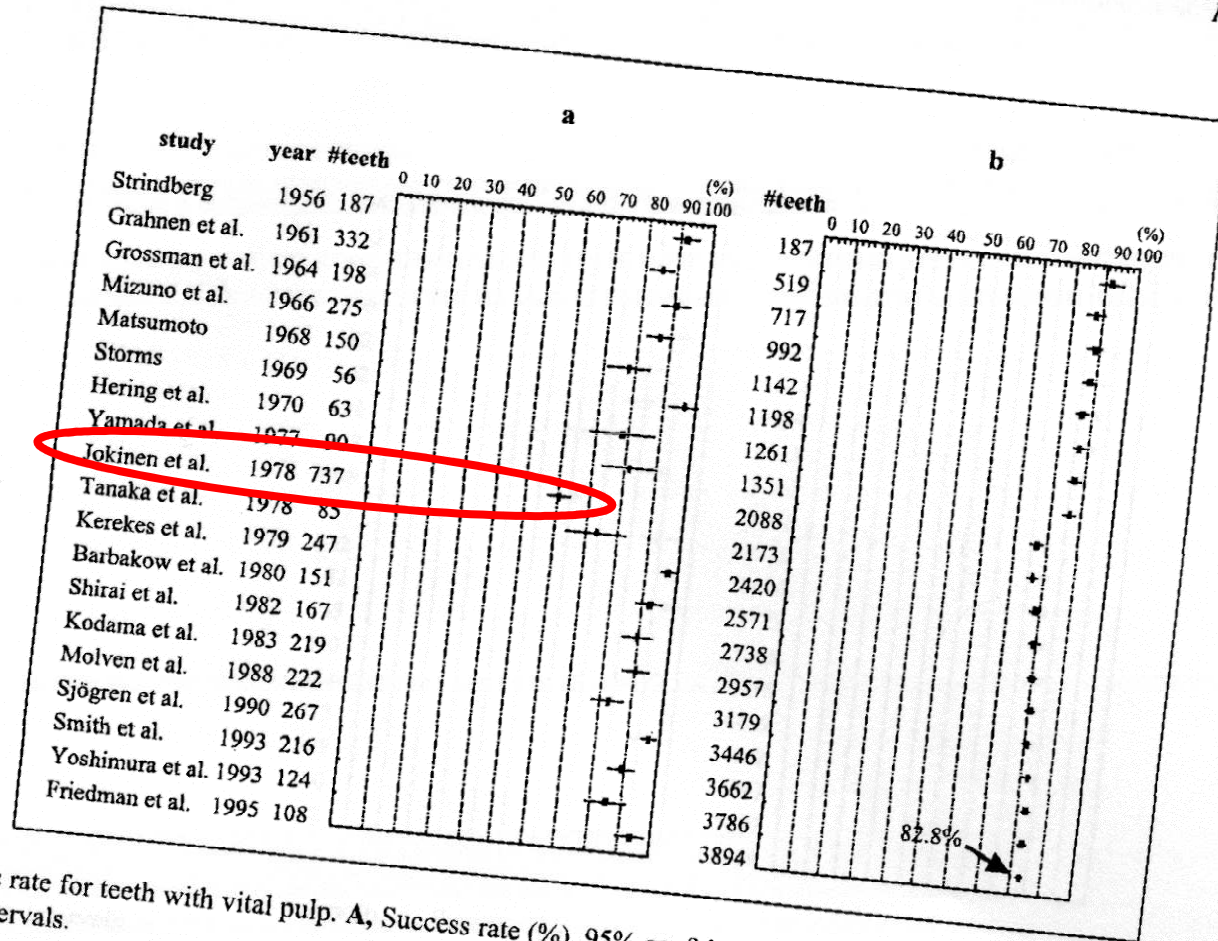
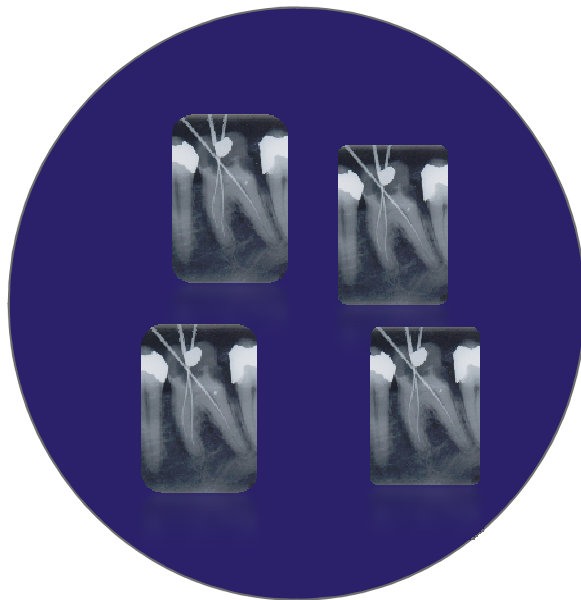


Fig 1. Success rate for teeth with vital pulp. **A**, Success rate (%), 95% confidence intervals. **B**, Cumulative success rate (%), 95% confidence intervals.

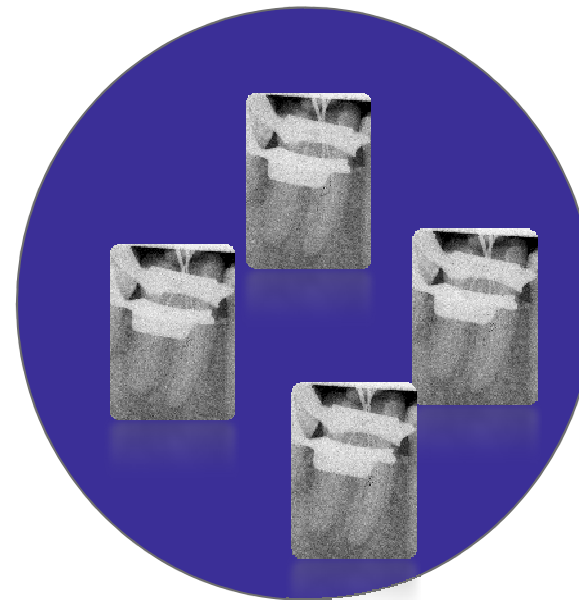


- Manglende basalkontrol af faktorer der kan have betydning for resultatet er grunden til at +/- kofferdam forsøget aldrig kommer!

Minus aseptik



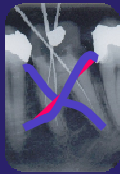
Plus aseptik



Randomised klinisk forsøg 'check' liste –kommer forsøget plus minus kofferdam - NEJ

Behandling A

Behandling B



I lyset af kontamineringsrisiko vil man aldrig iværksætte et forsøg hvor optimal aseptik ikke indgår – vi skal derfor ikke vente på sådan et forsøg - det kommer ikke !

