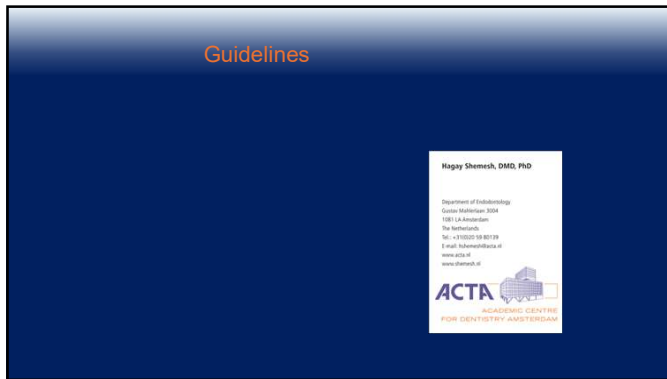
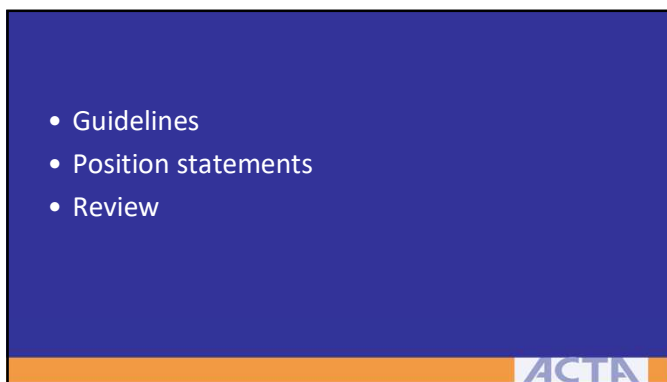




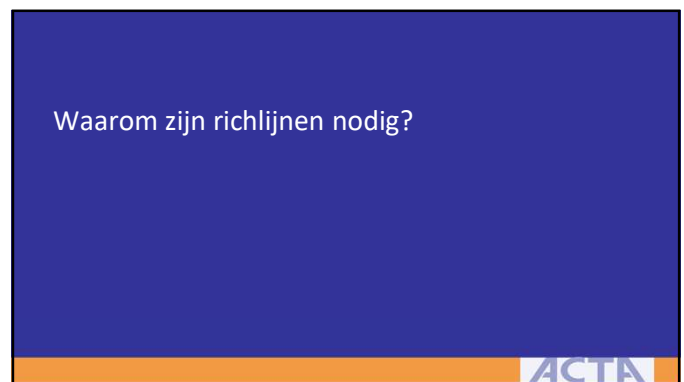
1



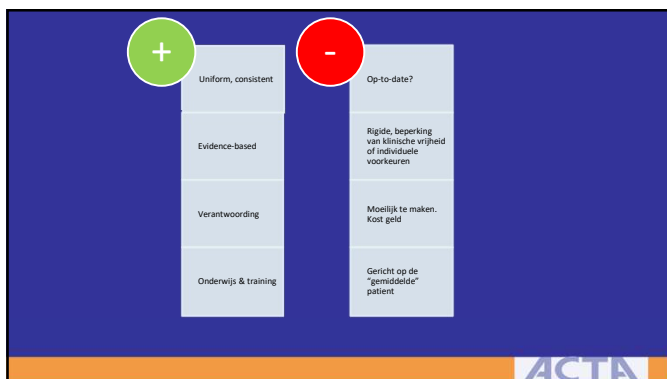
2



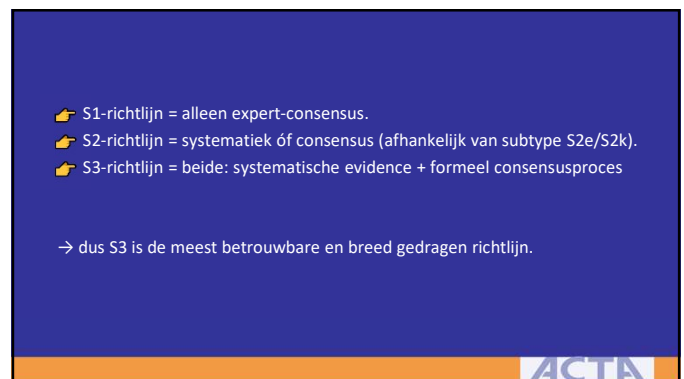
3



4



5



6

S3 richtlijn

- Hoogste kwaliteitsklasse van klinische richtlijnen
- Gebaseerd op een systematische literatuurreview (evidence-based).
- Combineert dit met een gestructureerd consensusproces tussen experts en beroepsgroepen.
- Er is aandacht voor multidisciplinaire inbreng, vaak ook inclusief patiëntenperspectief.
- Aanbevelingen worden voorzien van een gradatie van bewijskracht (hoe sterk is het bewijs).

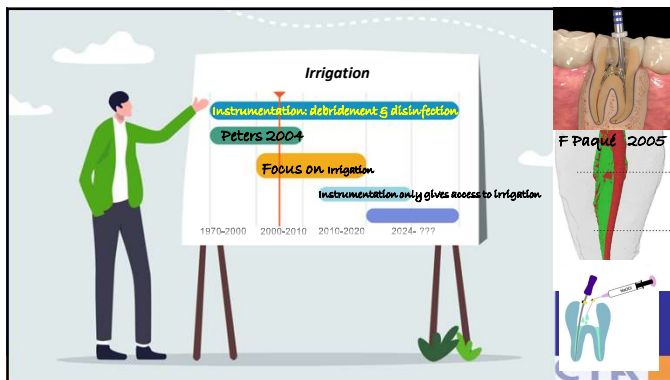
ACTA

7

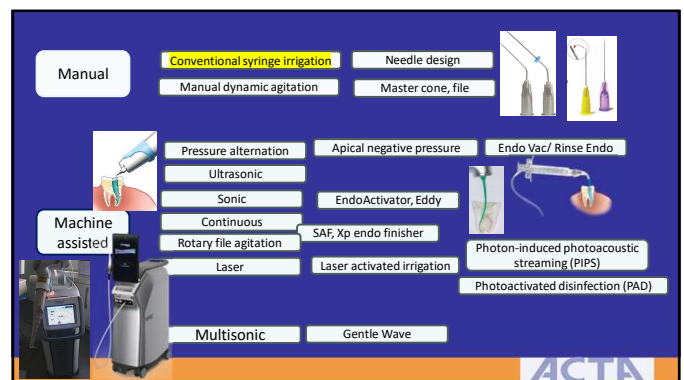
IRRIGATION: the clinical aspect



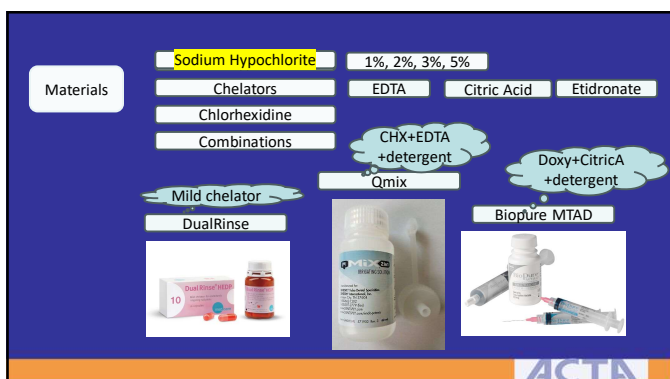
8



9



10



11

Why is hypochlorite syringe irrigation insufficient?

- Biofilm (activation to dislodge)
- Complex anatomy (activation to reach)
- Debris blocking the way, penetration in tubuli
- Influence on dentine (change of characteristics)
- Undesired chemical effects of irrigants

12

Quality guidelines for endodontic treatment: consensus report of the ESE 2006

Irrigation

- The irrigant solution should be delivered in copious amounts as far up the canal as possible without risking extrusion beyond the foramen. This can be performed with a syringe, ensuring that the solution is allowed to escape freely into the pulp chamber and is not delivered with excessive force. The solution may also be delivered by ultrasonic or sonic systems.

13



14

CLINICAL PRACTICE GUIDELINE- Treatment of pulpal and apical disease: ESE S3-level clinical practice guideline 2023

S classification	Description
S3	Evidence- and consensus-based guidelines
S2e	Evidence-based guideline
S2c	Consensus-based guideline
S1	Recommendation by group of experts

15

S3 guidelines recommendations

Grade	Description	Syntax used for recommendation	Factors influencing recommendation
A	Strong recommendation	We recommend / not to	

Diagnosis of apical periodontitis

Single-visit approach without Ca(OH)₂

16

Effectiveness of root canal irrigation and dressing for the treatment of apical periodontitis (R3.4)

PICO addressed by a SR	Evidence-based recommendation 1
Grade of recommendation S3 (very low)	In patients with asymptotically apical periodontitis in permanent teeth the irrigation NaOCl (5-6.25%) followed by EDTA and NaOCl (5-6.25%) was the recommended.
Quality of the evidence Supporting literature (Rosa-Fernandez et al., 2022)	
Prospective pain Very low (R3.4)	2 RCTs (n=222 patients)
Radiographic healing 1 year after treatment Very low (R3.4)	Radiographic healing 1 year after treatment: 1 RCT (n=46 patients)
Survival and other outcomes not reported	
Strength of consensus Consensus (100% of the panel agreed that this guideline is valid)	

1. No mention of Chlorhexidine or other irrigation materials
2. Activation?
3. Volume?

Effectiveness of adjunct therapy for treatment of apical periodontitis (R3.6)

PICO addressed by a SR	Evidence-based recommendation
Grade of recommendation S3 (very low)	In patients with apical periodontitis in permanent teeth the irrigant NaOCl (5-6.25%) followed by EDTA and NaOCl (5-6.25%) was the recommended.
Quality of the evidence Supporting literature (Mora et al., 2022)	
Prospective pain Low (R3.6)	Prospective pain: 1 RCT (n=436 patients)
Radiographic healing 1 year after treatment Low (R3.6)	Radiographic healing 1 year after treatment: 1 RCT (n=226 patients), 1 cohort (n=46 patients)
Survival and other outcomes not reported	
Strength of consensus Consensus (100% of the panel agreed that this guideline is valid)	

1. LAJ, PIPS, Ultrasonic, Sonic...
2. Volume?

17

Clinical studies

- Difficult to perform
- Often low numbers of patients
- "no difference"

Outcome predictors/ Prognostic factors

- Instrumentation?
- Irrigation?
- Obturation?

18

In vitro studies

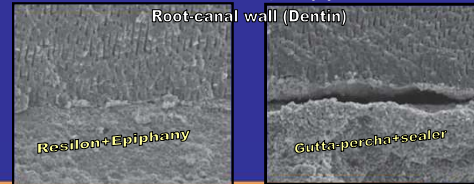
- Leakage/ "sealability"
- Microbiology
- Cytotoxicity

Clinical relevance?

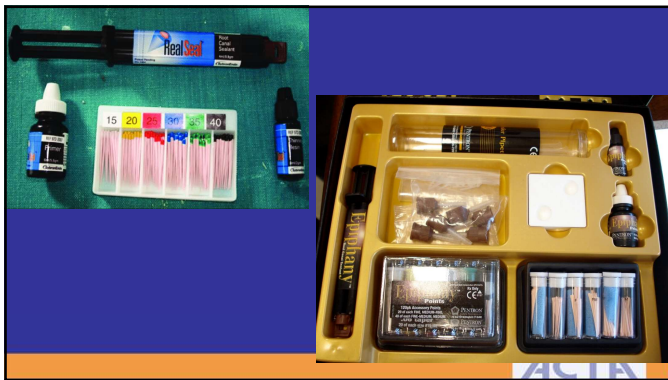
19

Resilon-Epiphany

- New composite root canal filling material
- Introduced in 2004 (Shipper *et al.* JOE)



20



21

"monoblock" concept



22

Leakage studies

Resilon is better than GP	GP is better dan Resilon	GP=Resilon
Shipper <i>et al.</i> 2004	Shemesh <i>et al.</i> 2006	Shemesh <i>et al.</i> 2007
Budrumglu & Tunga 2006	Paque & Sirtes 2007	De Deus <i>et al.</i> 2007
Different conditions & models	Pasqualini <i>et al.</i> 2007	Baumgartner <i>et al.</i> 2007

23

Long-term Outcomes of Endodontic Treatment Performed with Resilon/Epiphany

Strange *et al.* JOE 2019

Resilon-treated teeth were 5.3 times more likely to have a periapical index of 3 to 5 at follow-up compared with gutta-percha .

Long-term Clinical Outcome of Teeth Obturated with Resilon.

Barborka *et al.* JOE 2017

Teeth obturated with Resilon had 5.7 times greater chance of failure compared with teeth obturated with GP.

24

- The most extensively studied
- Surge of enthusiasm in the early '2000s

Example : ultrasonic irrigation

25

Căpută PE et al. J Endod. 2019

...no strong clinical recommendations could be formulated.

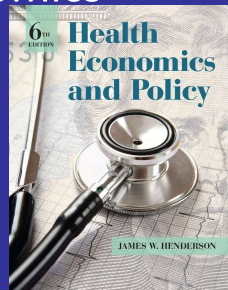
Silva EJNL et al. Br Dent J. 2019

...there was no evidence of effective improvement on periapical healing ...that supports the use of ultrasonic irrigation...

26

Health economics

"Although tooth loss may be financially preferable to the patient in the short-term, retaining teeth using root canal treatment is usually more cost-effective than the option of removing them and replacing them prosthodontically" (Pennington et al., 2009; Schwendicke & Herbst, 2023).

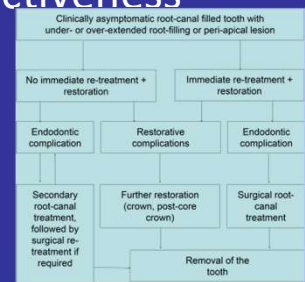


ESE S3 guidelines 2023

27

Cost-effectiveness

Conclusions: The high costs for secondary root canal treatment do not seem to be outweighed by the increased risks associated with certain radiographic findings in asymptomatic teeth.



Schwendicke & Stolpe (2015) JOE

28

Overtreatment

Machine assisted

Ultrasonic

Sonic

Continuous

Rotary file agitation

Laser

Multisonic

Gentle Wave

Needle design

Master cone, file

Endo Vac/ Rinse Endo

Photo-induced photoacoustic streaming (PIPS)

Photoactivated disinfection (PAD)

in-vitro Warning!

29

So what should we do ?

- **As clinicians:** follow the ESE guidelines till more relevant evidence is available **

"you can consider"

Hopefully, more evidence will be available

- **As researchers:** Try to choose research topics that are relevant to patients/ clinicians

30

Suggested irrigation protocol

NaOCl fine needle close to WL
EDTA after instrumentation
Final rinse with NaOCl

If activation necessary- Ultrasonic



Boutsioukis & Arias-Moliz (2022) IEJ

31

..And a final thought :

Guidelines are an important tool. However, they might also provide an erroneous recommendation for a specific patient



Guerra-Farfan et al. (2023) Injury

32

Outcome

Some claim that outcome studies will NEVER be able to give us answers about questions as a preferable irrigation protocol

- Sample size/ effect size
- Recall time
- Outcome evaluation
- Confounding factors

Yildiz et al. IEJ 2024

33

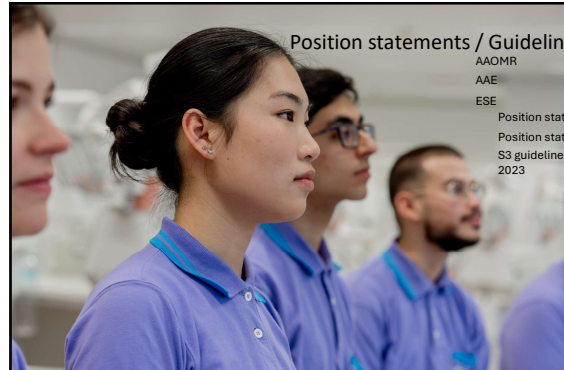
Use of CBCT

34

Position statements / Guidelines

AAOMR
AAE
ESE

Position statement 2014
Position statement 2019
S3 guidelines 2023



35

European Society of Endodontology position statement: the use of CBCT in endodontics
S Patel, C Durack, F Abella, M Roig, H Shemesh, P Lambrechts, K Lemberg
IEJ 2014

Every image must be justified and optimized. A record of the justification process must be maintained

European Society of Endodontology position statement: Use of cone beam computed tomography in Endodontics
S. Patel, J. Brown, M. Semper, F. Abella, F. Mannocci
IEJ 2019

Every image is justified, optimized and reported on...CBCT must be used cautiously

The European Society of Endodontology (ESE) S3-level clinical practice guideline.
Duncan HF, Kirkevang LL, Peters OA, El-Karim I, Krastl G, Del Fabbro M, Chong BS, Galler KM, Segura-Egea JJ, Kebschull M; ESE Workshop Participants and Methodological Consultant.
IEJ 2023

- CBCT *may be considered* as an additional diagnostic measure in cases where there is doubt about the diagnosis.

Grade of recommendation	Syntax
STRONG	We recommend (not to)
WEAK	We suggest (not to)
OPEN	May be considered

36



37



38

J Am Dent Assoc 2024
Applying the AAE and American Academy of Oral and Maxillofacial Radiology guidelines for CBCT prescription: Impact on endodontic clinical decisions
Chugal et al.

Conclusions

- CBCT imaging contributed predominantly to Tx decisions rather than diagnostic determinations.

JADA 2024: Chugal et al.

39

Conclusies

Richtlijnen

- Belangrijk
- afwijken mag-maar met een reden
- Gebaseerd op outcome studies, expert opinie en consensus sessies
- In endodontologie weinig **STERKE** aanbevelingen, vooral suggesties
- Updates in de gaten houden

40

- NVvE richtlijn
- ESE richtlijn
- Trauma (tandletsel) richtlijn

41