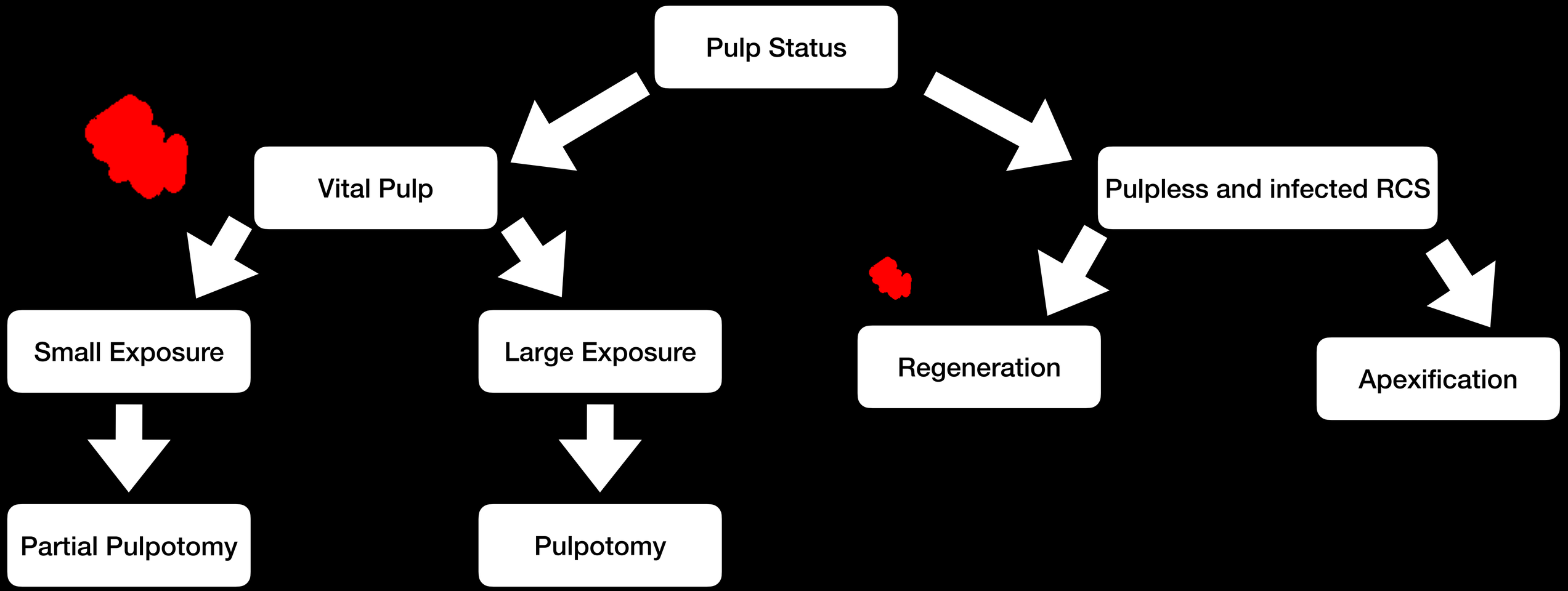
Management of Immature Teeth

Dr Mostafa Elkholy, BDS, MSc (Endo), PhD (Endo)
Senior Lecturer and Discipline Lead in Endodontics
Dental School, UWA

Manangement



Dr Mostafa Elkholy







Dr Mostafa Elkholy

Manangement of Immature root with necrotic pulp

- Custom fitting of the filling material

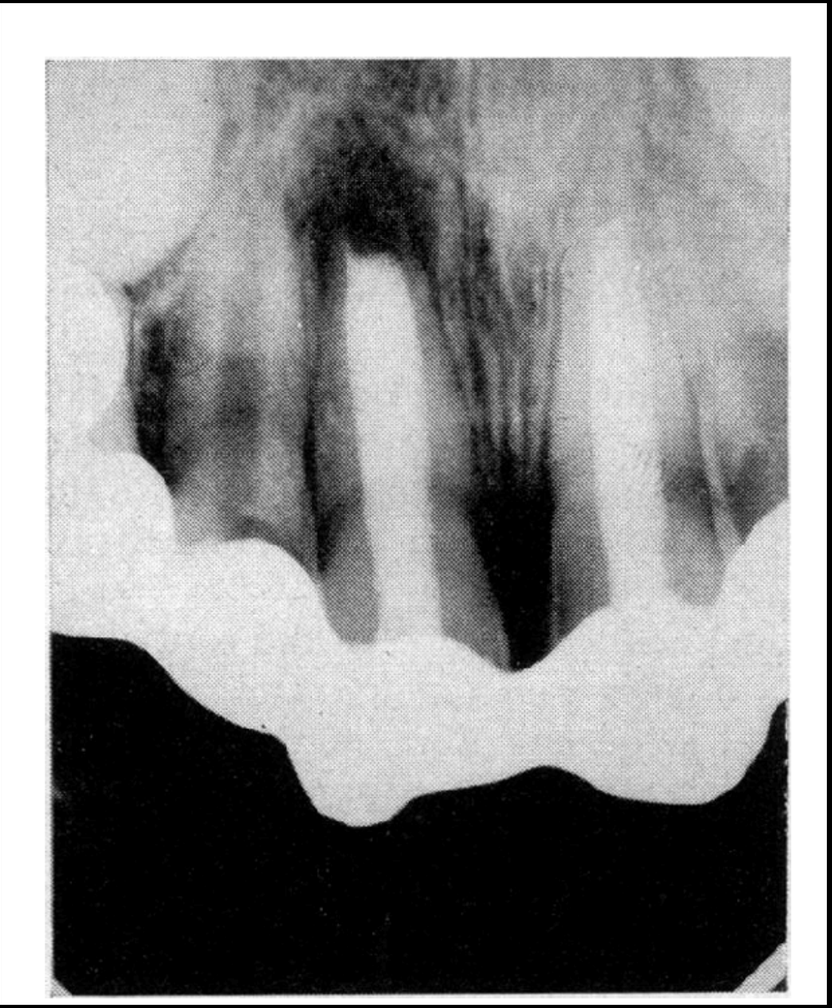
Friend LA. The root treatment of teeth with open apices.Proc R Soc Med 1966;19:1035–6.

- Paste fills

Friend LA. Treatment of immature teeth and non-vital pulps. J Br Endod Soc 1967;1:28–33

- Apical surgery

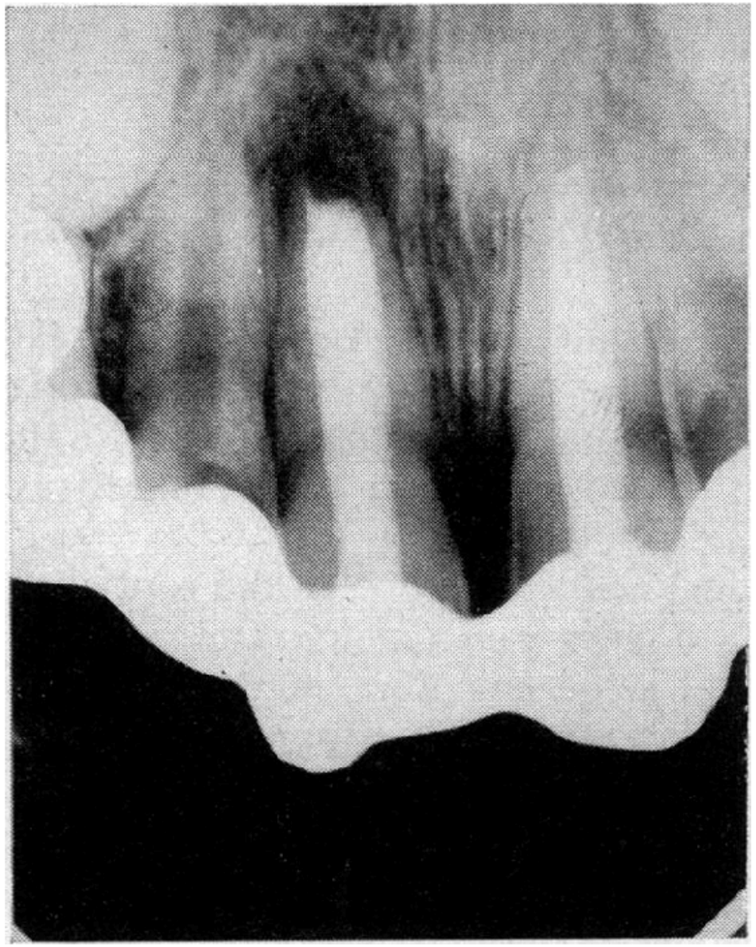
Ingle JI. Endodontics. Philadelphia: Lea and Febiger;1965:504



Dr Mostafa Elkholy

Manangement of Immature root with necrotic pulp

- Custom fitting of the filling material
  - not advisable as the apical portion of the root is frequently wider than the coronal portion, making proper condensation of the GP impossible.
- Apical surgery
  - difficulty of obtaining the necessary apical seal in the young pulpless tooth with its thin, fragile, irregular walls at the root apex



AMERICAN ASSOCIATION OF ENDODONTISTS

AAE

1943

TWENTY FIRST ANNUAL MEETING

APRIL 17, 18, 19, 1964

SHOREHAM HOTEL

WASHINGTON, D. C.

Leo Grudin	1. When should endodontics start at a University level? 2. What should an endodontic course include? 3. Should there be a standardization of teaching methods?
J. Henry Kaiser	1. implantation of luxated teeth 2. treatment of wide open canals with partially degenerated pulps
F. J. Marshall	1. Patient history and its relevance. 2. Antibiotics, medications and contra-indications.
C. G. Maurice	1. to culture or not to culture in endodontic treatment 2. disinfection and sterilization of endodontic instruments and materials 3. root canal filling: materials, methods, technique 4. the standardization of root canal instrument size and its impact on endodontics 5. causes of treatment failures
Richard M. Moodnik	1. histopathology of pulp; pulp reactions to operative procedures 2. endo-periodontal problems 3. recent findings of research project comparing N-2 and standard endodontic procedures

Dr Mostafa Elkholy

Therapy for the divergent pulpless tooth by continued apical formation

Alfred L. Frank, DDS, Los Angeles

Successful endodontic treatment requires that

ing of gutta-percha or the preparation of the apex to receive an apical seal such as an alloy of silver amalgam (Fig. 1).

Surgical intervention, when necessary, is a complete and successful procedure. This paper is not intended to condemn the periradicular technic; however, mechanical and psychological aspects

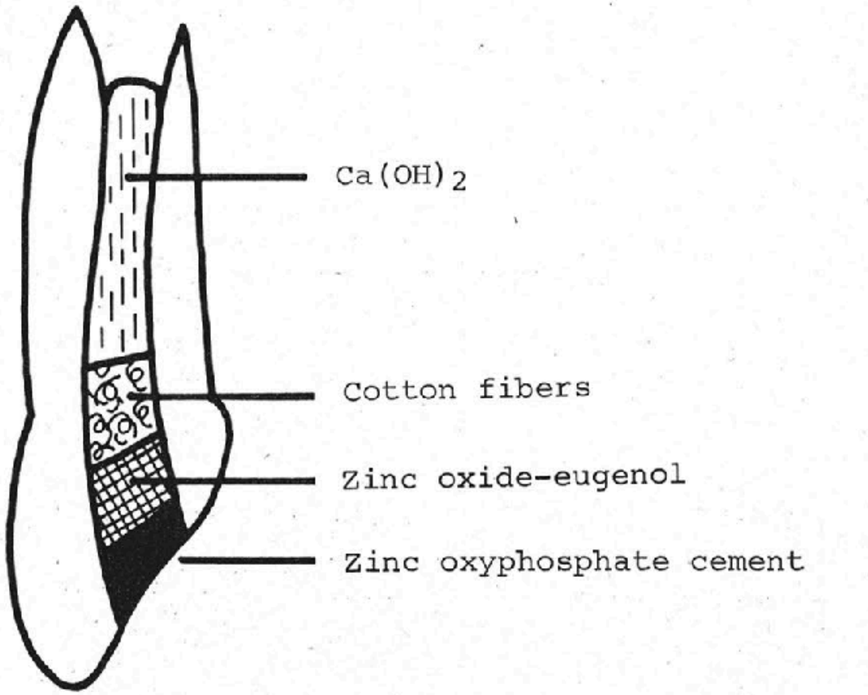
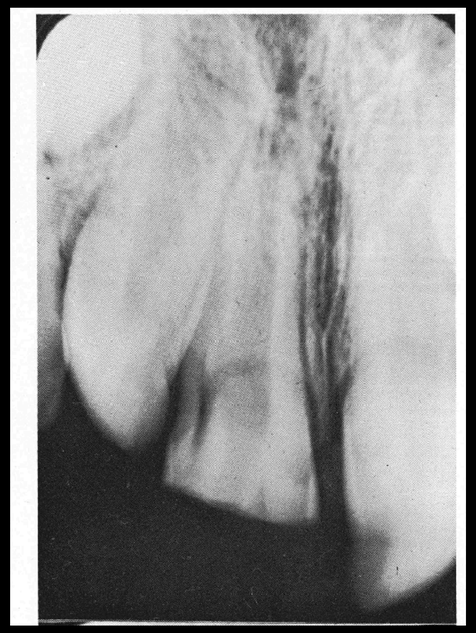


Fig. 3 • Calcium hydroxide therapy for divergent pulpless tooth. This temporary seal is to be replaced with gutta-percha root canal filling after periapical closure

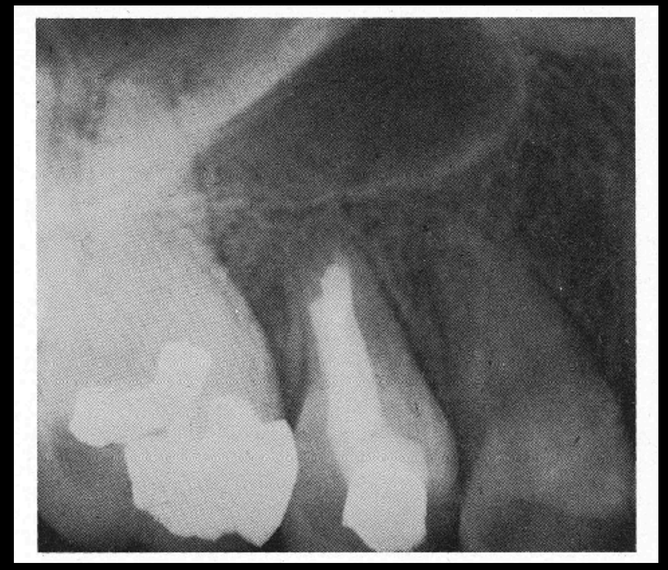
Frank AL. Therapy for the divergent pulpless tooth bycontinued apical formation. J Am Dent Assoc 1966;72:87–93

Dr Mostafa Elkholy



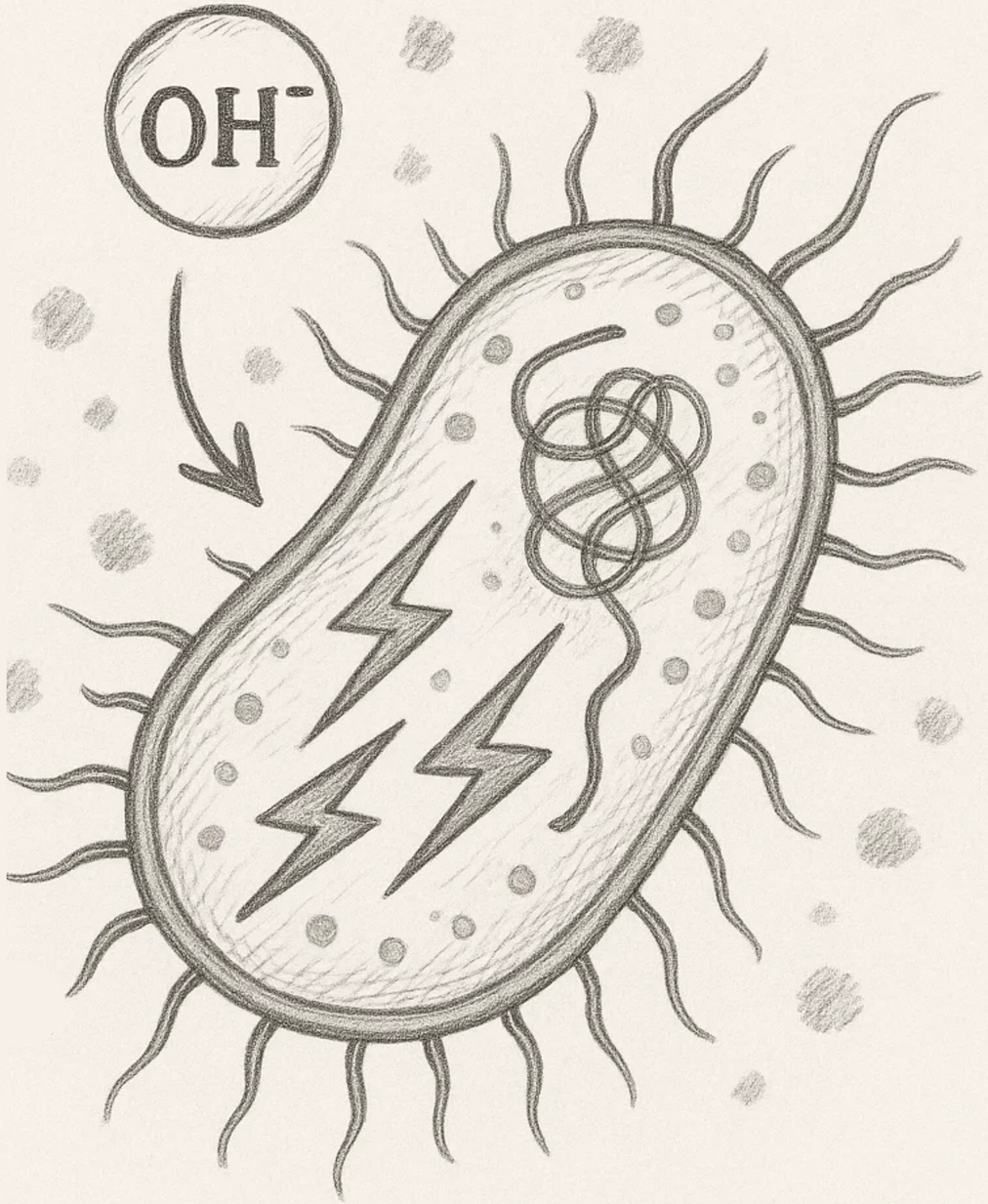






Frank AL. Therapy for the divergent pulpless tooth bycontinued apical formation. J Am Dent Assoc 1966;72:87–93

Dr Mostafa Elkholy

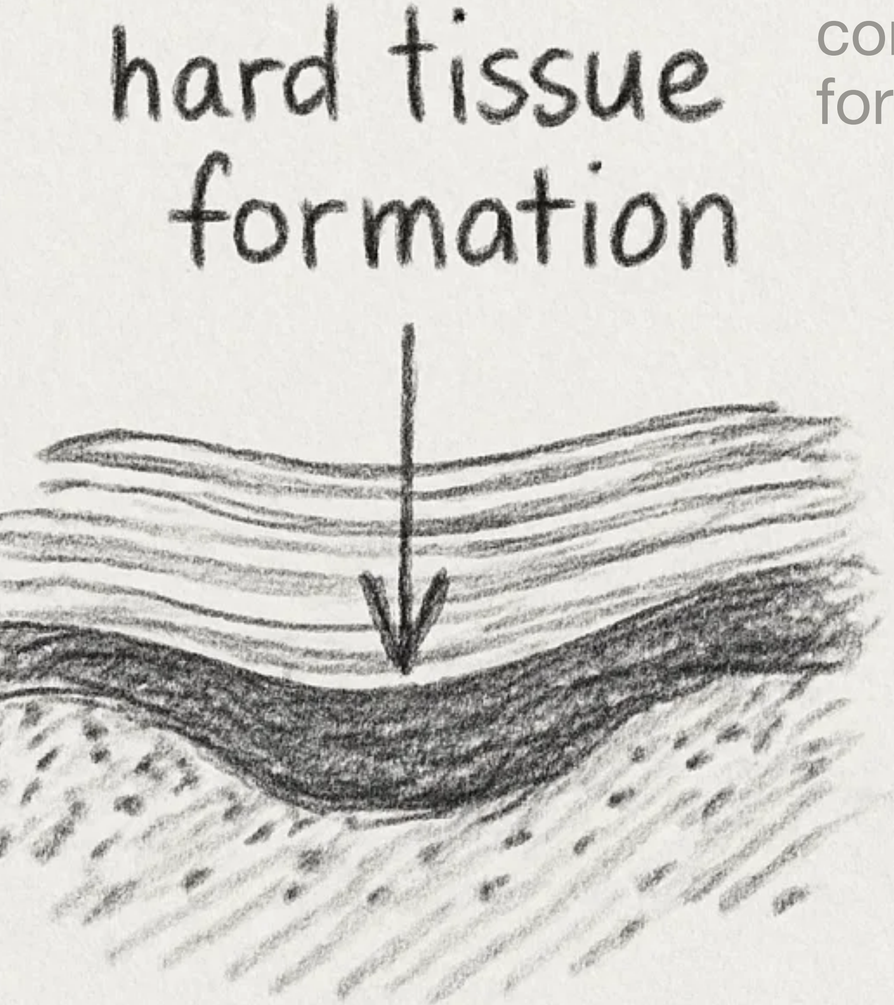


- Ca(OH)2 is antimicrobial because of its release of hydroxyl ions which can cause damage to the bacterial cellular components.

Safavi KE, Nichols FC (1993) Journal of Endodontics 19, 76–8.

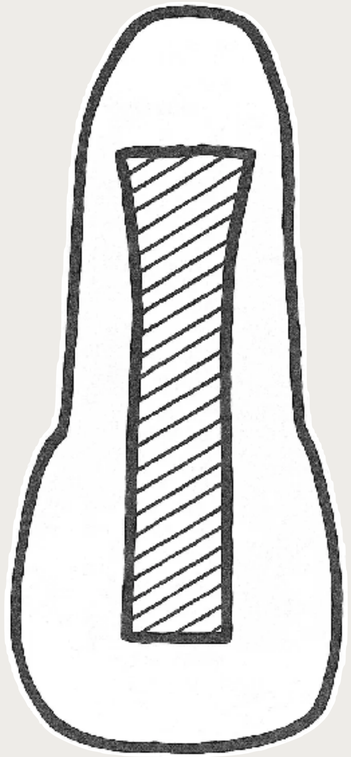
- Ca(OH)2 chemically alters LPS which affects itsvarious biological properties

Safavi KE, Nichols FC (1994) Journal of Endodontics 20, 127–9.



Ca(OH)2 has suggested to have osteo-inductive properties, considering that the high pH may be a contributing factor for the induction of hard tissue formation.

Javelet J, Torabinejad M, Bakland LK (1985). Journal of Endodontics 11,375–8.



Dr Mostafa Elkholy

- **Apexification timeframe**
  - Apical barrier formation with $Ca(OH)_2$ can be considerable — often up to 20 **months**.
- **Factors that affect time needed**
  - Patient **age**
  - Presence of **symptoms**
  - Presence of **periradicular radiolucencies**
- **Treatment protocol note**
  - $Ca(OH)_2$ paste is typically **refreshed every** 3 **months** (Rafter, 2005).

↳ every month is better!

Dr Mostafa Elkholy

SHORTCOMINGS OF $Ca(OH)_2$ APEXIFICATION

Long overall treatment time

Multiple visits, creating high demands on patients/ carers and increased clinical costs

Higher risk of tooth fracture when $Ca(OH)_2$ is used as a long-term root-canal dressing

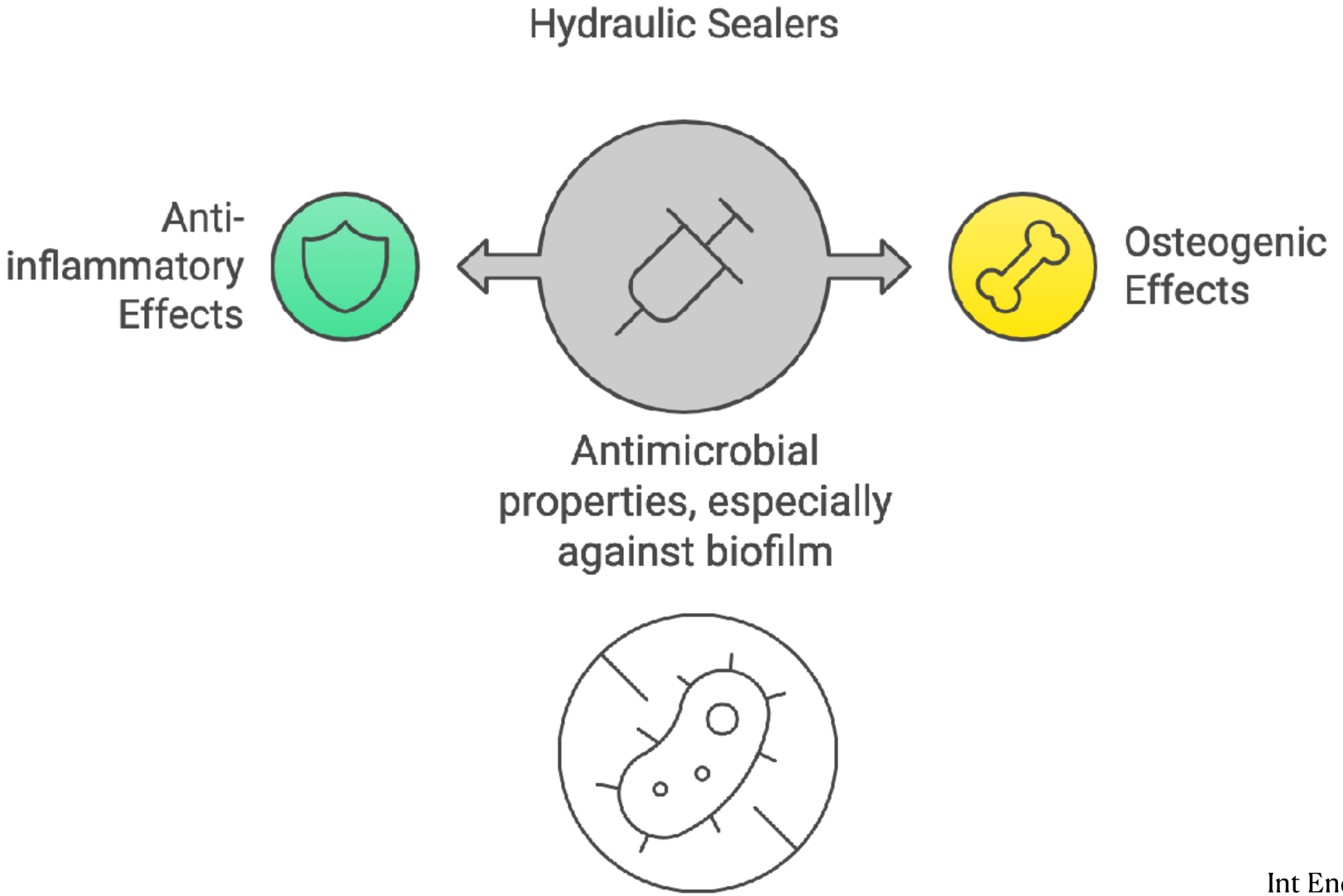
Andreasen JO, Farik B, Munksgaard EC Endod Dent Traumatol 2002;18, 134–7.

Cvek M. Endod Dent Traumatol 1992;8:45–55.

Dr Mostafa Elkholy


MTA plug

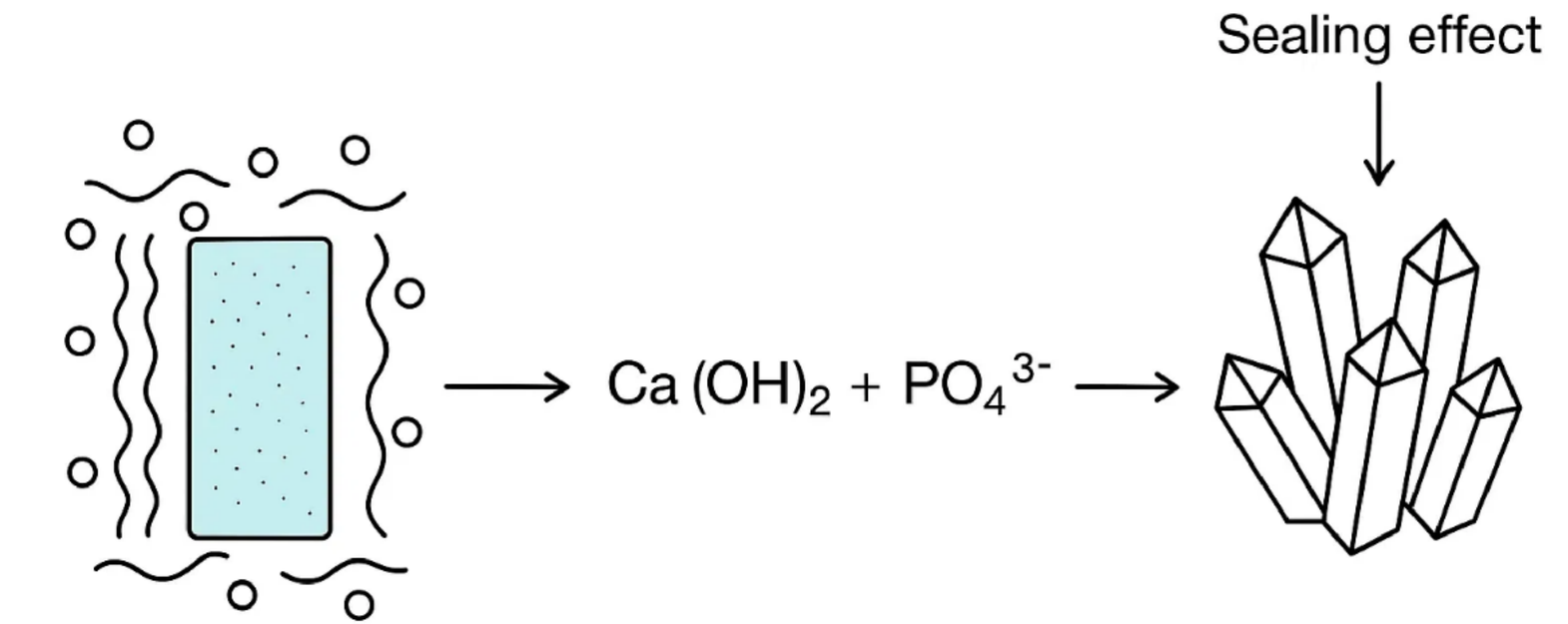
Biological Characteristics



THE UNIVERSITY OF WESTERN AUSTRALIA

Int Endod J. 2022;55(Suppl. 3):710–777

Biological Characteristics



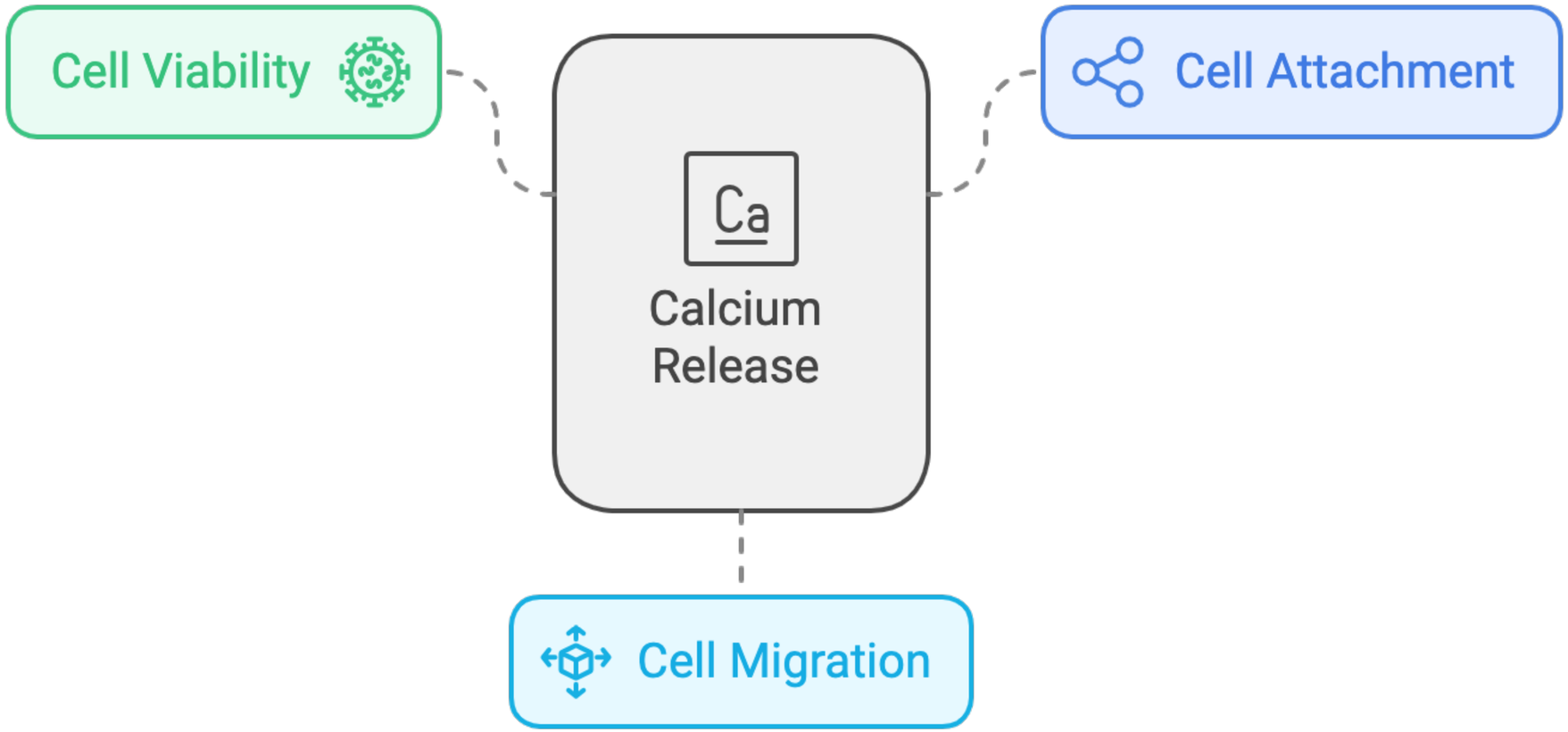
Moisture resistance
Bioceramic material
in contact with
tissue fluids and blood

Hydroxyapatite crystals

THE UNIVERSITY OF WESTERN AUSTRALIA

ıdod J. 2022;55(Suppl. 3):710–777

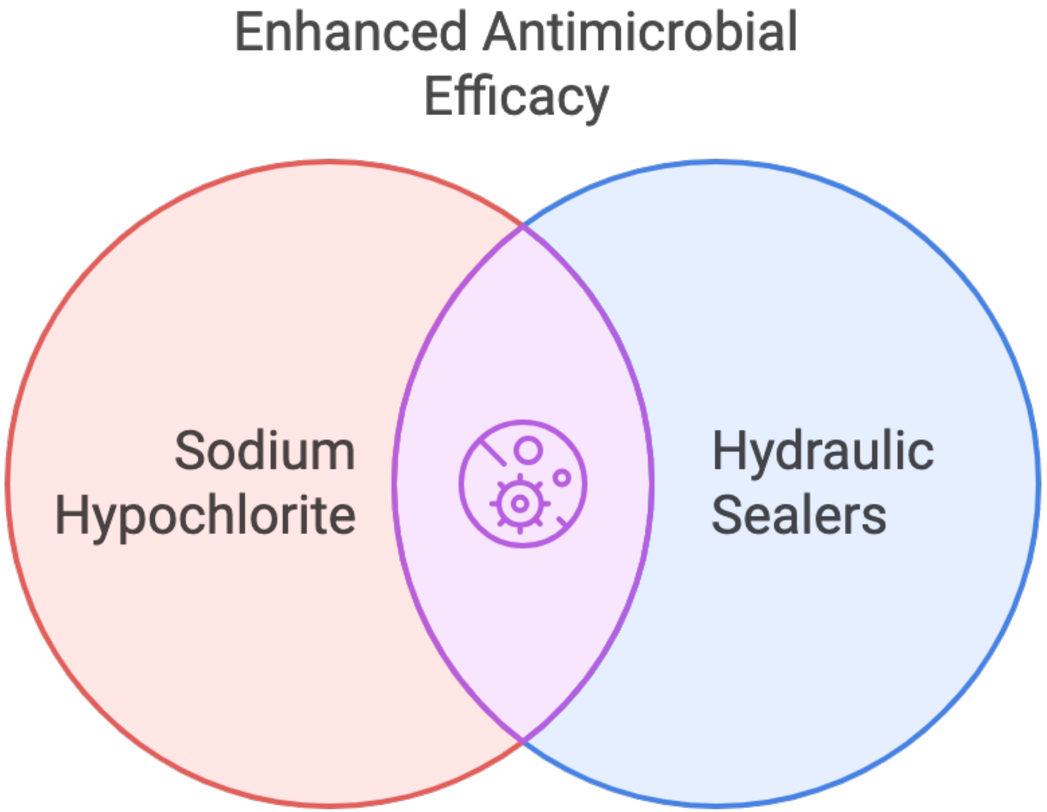
Biological Characteristics



THE UNIVERSITY OF WESTERN AUSTRALIA

Int Endod J. 2022;55(Suppl. 3):710–777

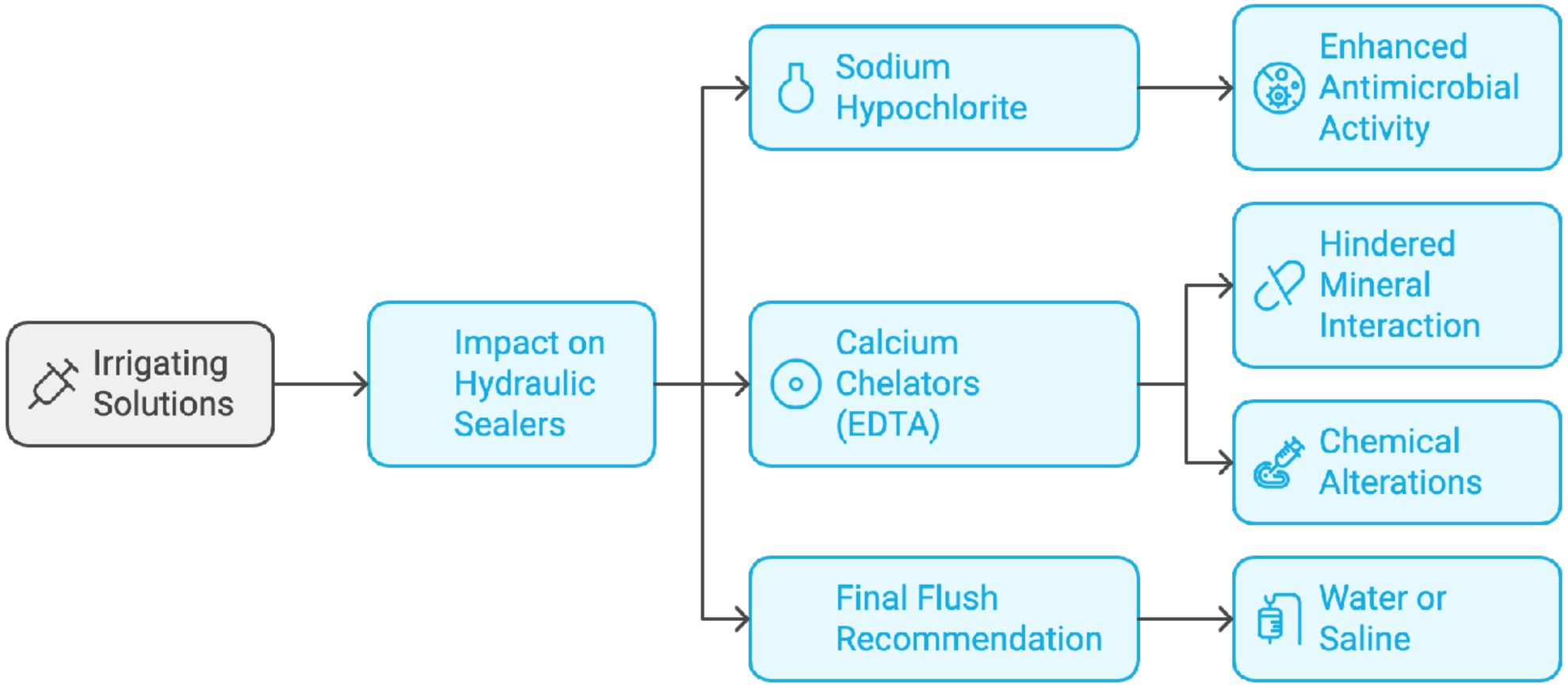
Biological Characteristics



THE UNIVERSITY OF WESTERN AUSTRALIA

Int Endod J. 2022;55(Suppl. 3):710–777

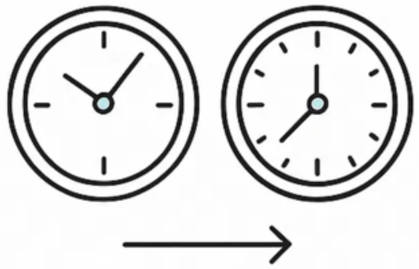
Clinical Performance and Material Interactions



THE UNIVERSITY OF WESTERN AUSTRALIA

Int Endod J. 2022;55(Suppl. 3):710–777

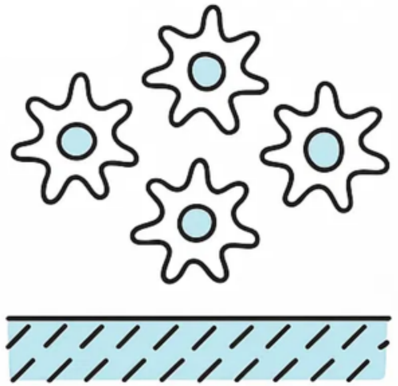
Clinical Performance and Material Interactions



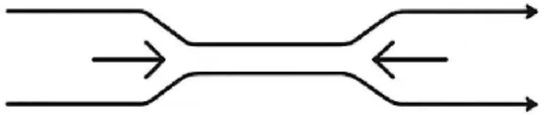
Stable and insoluble



SUPERIOR LONG-TERM SEALING



BIOCOMPATIBILITY



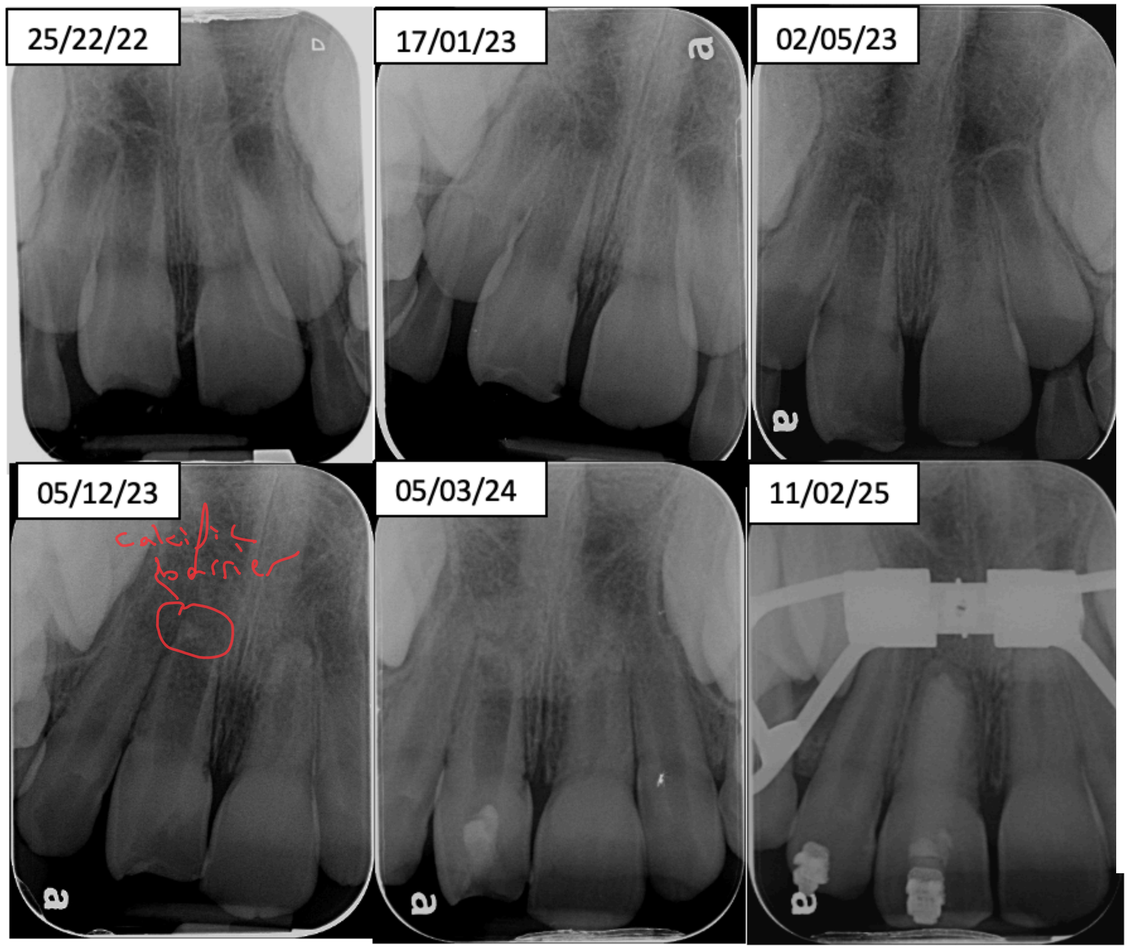
Material expansion during setting

THE UNIVERSITY OF WESTERN AUSTRALIA

Int Endod J. 2022;55(Suppl. 3):710–777

concussed too

Apical Plug





PA Taken at consultation 10/06/2025. Tooth 11 has incomplete RCT with medication visible in the RCS. The root of the tooth 11 is thin and there is an apical barrier present. Tooth 21 has a calcified pulp chamber. The periapical tissues teeth 11 and 21 appear normal.

THE UNIVERSITY OF WESTERN AUSTRALIA

Ryan Butler
Endodontics Registrar

Apical Plug





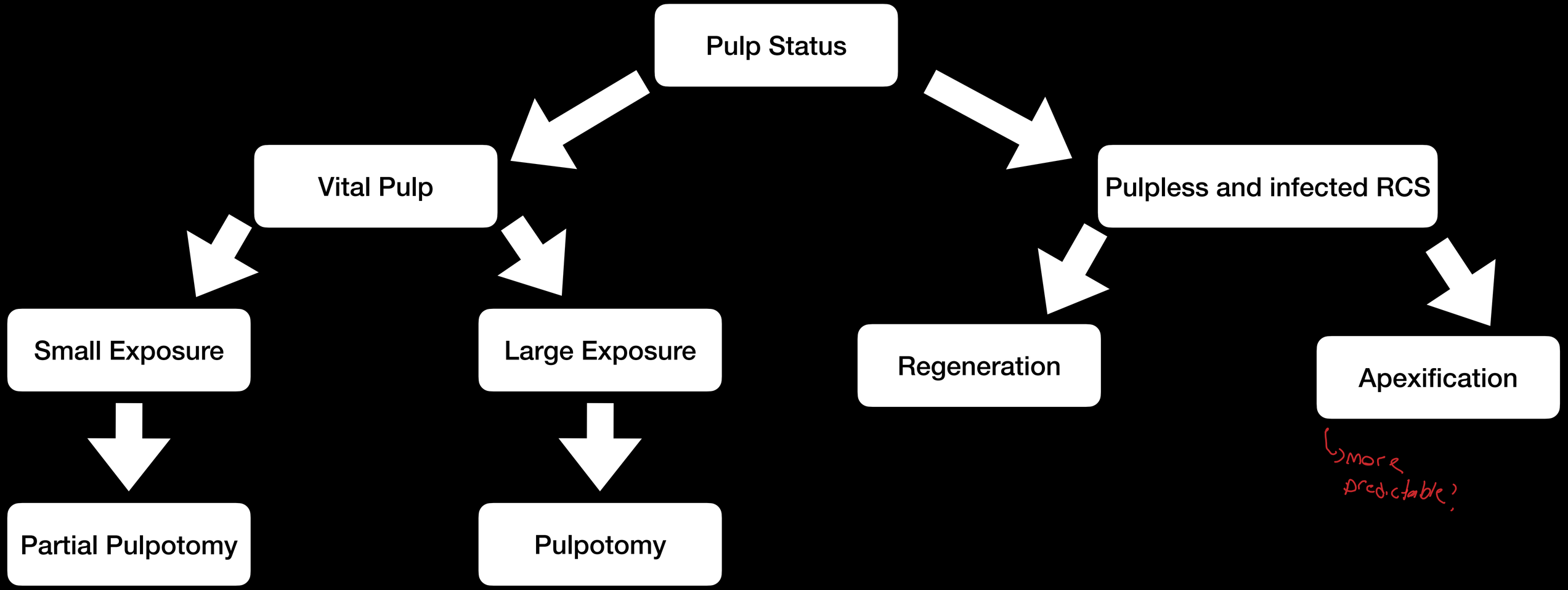


THE UNIVERSITY OF WESTERN AUSTRALIA

Ryan Butler

Endodontics Registrar

Manangement







Vital pulp treatment



Control infection

Irrigation with low conc
$NaOCl + Ca(OH)_2$





Initiate bleeding



Seal with HCSC





Vital pulp treatment



Control infection

Irrigation with low conc
$NaOCl + Ca(OH)_2$





Initiate bleeding



Seal with HCSC





Vital pulp treatment



Control infection

Irrigation with low conc
$NaOCl + Ca(OH)_2$





Initiate bleeding



Seal with HCSC



Apexification HCSC

Questions ?