


Pulpitis: etiology, pathogeny and classifications. Pathomorphology of acute and chronic forms of pulpitis. Symptomatology of pulpitis. Description and mechanism of pain syndrome origin. Clinic, diagnostics of acute forms of pulpitis.

A stylized silhouette of a mountain range in shades of teal, located at the bottom right of the slide.

Introduction

- ◆ **Endodontics** is the specialty of dentistry that manages the **prevention**, **diagnosis**, and **treatment** of the dental pulp and the periradicular tissues that surround the root of the tooth



Causes of Pulpitis



1. Physical irritation

- Most generally brought on by extensive decay.

2. Trauma

- Blow to a tooth or the jaw



3. Anachoresis

- retrograde infections





Signs and Symptoms

- ◆ Pain when biting down
- ◆ Pain when chewing
- ◆ Sensitivity with hot or cold beverages
- ◆ Facial swelling
- ◆ Discolouration of the tooth




Endodontic Diagnosis

- ◆ **Subjective examination**
 - Chief complaint
 - Character and duration of pain
 - Painful stimuli
 - Sensitivity to biting and pressure
 - Discolouration of tooth

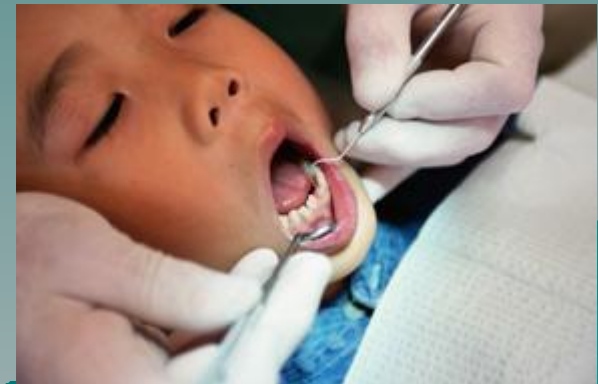


Important questions?


- ◆ What do you think the problem is?
 - ◆ Does it hurt to hot or cold?
 - ◆ Does it hurt when you're chewing?
 - ◆ When does it start hurting?
 - ◆ How bad is the pain?
 - ◆ What type of pain is it?
 - ◆ How long does the pain last?
 - ◆ Does anything relieve it?
 - ◆ How long has it been hurting?
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- A decorative graphic in the bottom right corner of the slide, consisting of a silhouette of a mountain range in various shades of teal and blue.

◆ **Objective examination**

- Extent of decay
- Periodontal conditions surrounding the tooth in question
- Presence of an extensive restoration
- Tooth mobility
- Swelling or discoloration
- Pulp exposure



Challenges in diagnosis of pulpitis

- ◆ **Referred pain** & the **lack of proprioceptors** in the pulp  localizing the problem to the correct tooth can often be a considerable diagnostic challenge
- ◆ Also of significance is the difficulty in relating the **clinical status** of a tooth to **histopathology** of the pulp in concern
- ◆ Unfortunately, no reliable symptoms or tests consistently correlate the two.

Diagnostic Tests

- ◆ Percussion
 - ◆ Palpation
 - ◆ Thermal
 - ◆ Electrical
 - ◆ Radiographs
- 

1. Percussion tests

- ◆ Used to determine whether the inflammatory process has extended into the **periapical tissues**
- ◆ Completed by the dentist tapping on the incisal or occlusal surface of the tooth in question with the end of the mouth mirror handle held parallel to the long axis of the tooth



2. Palpation tests

- Used to determine whether the inflammatory process has extended into the **periapical tissues**
- The dentist applies firm pressure to the mucosa above the apex of the root



3. Thermal sensitivity



Necrotic pulp will not respond to cold or hot

1. Cold test

- ◆ Ice, dry ice, or ethyl chloride used to determine the response of a tooth to cold

2. Heat test

- ◆ Piece of gutta-percha or instrument handle heated and applied to the facial surface of the tooth

Evaluation of thermal test results

4 distinct responses:





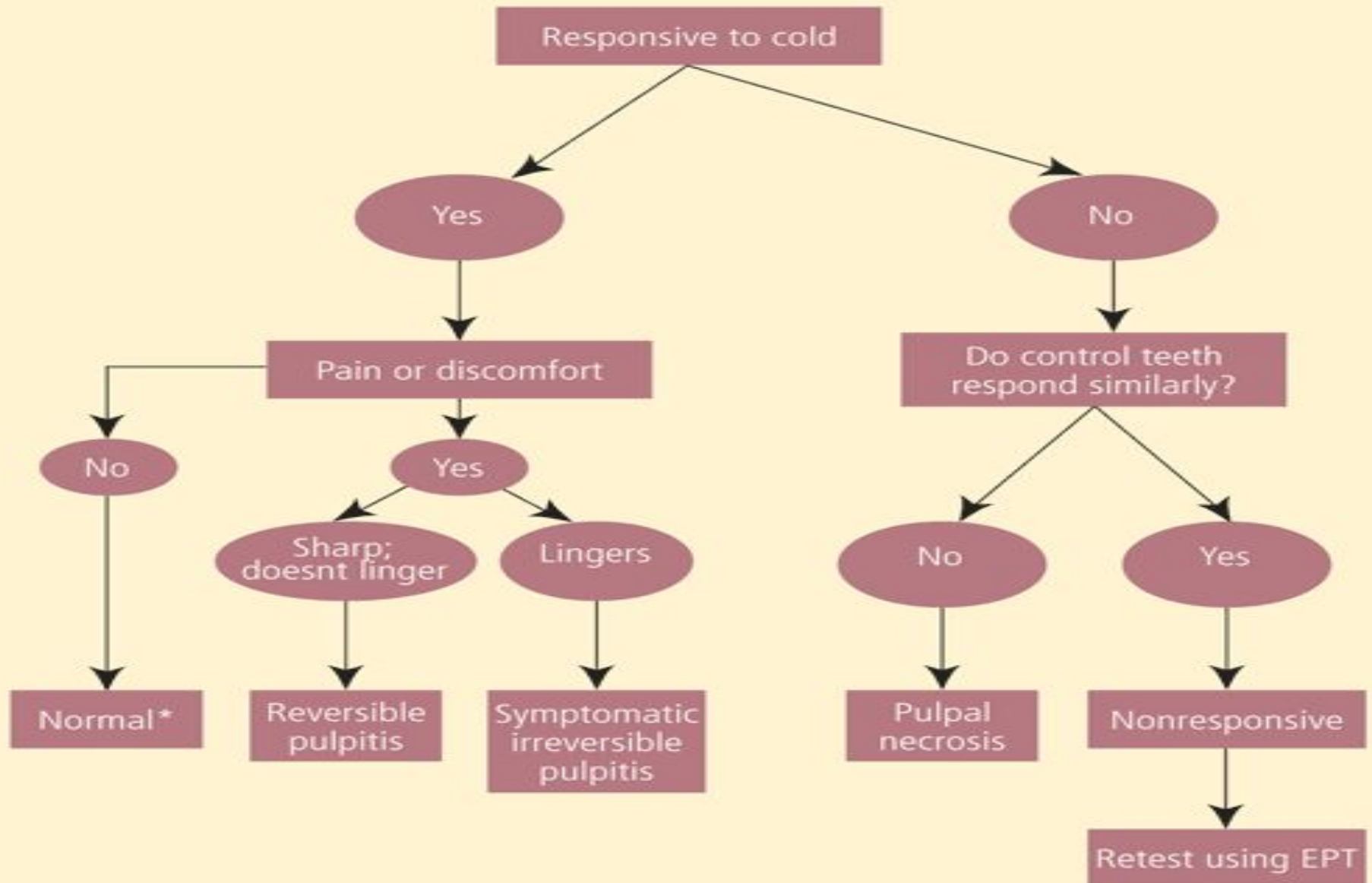

1. No response  non-vital pulp or false negative
2. Mild response  normal
3. Strong but brief  reversible
4. Strong but lingering  irreversible

Chart 1. A pulpal diagnosis flowchart.



* Consider asymptomatic irreversible pulpitis if response is normal but inflammation produced by caries (excavation, trauma, and so forth) is present

Causes of false positives/negative

1. **Calcified** canals
 2. **Immature** apex – usually seen in young patients
 3. **Trauma**
 4. **Premedication** of the patient – pulp sedated
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4. Electric pulp testing

Delivers a small electrical stimulus to the pulp

Factors that may influence readings:

- ◆ Teeth with extensive restorations
- ◆ Teeth with more than one canal
- ◆ Dying pulp can produce a variety of responses
- ◆ Moisture on the tooth during testing
- ◆ Batteries in the tester may be weak

Placement of a pulp tester.



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5. Radiographs

1. Pre-operative radiograph

- Invaluable diagnostic tool
- Periapical radiolucency
- Widening of PDL
- Deep caries
- Resorption
- Pulp stones
- Large restorations
- Root fractures



Requirements of Endodontic Films

- ◆ Show 4-5 mm beyond the apex of the tooth and the surrounding bone or pathologic condition.
 - ◆ Present an accurate image of the tooth without elongation or fore-shortening.
 - ◆ Exhibit good contrast so all pertinent structures are readily identifiable.
- 



Quality radiograph in endodontics.



Diagnostic Conclusions

- 1. Normal pulp**
- 2. Pulpitis**

Normal pulp

There are no subjective symptoms or objective signs. The pulp responds normally to sensory stimuli, and a healthy layer of dentine surrounds the pulp



Pulpitis

The pulp tissues have become inflamed

Can be either:

Acute

- inflammation of the periapical area
- usually quite painful

Chronic

- Continuation of acute stage or
- low grade infection



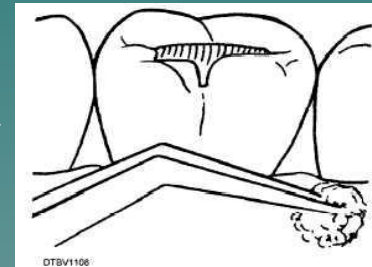
Acute Pulpitis

- ◆ mainly occurs in children teeth and adolescent
- ◆ pain is more pronounced than in chronic



Symptoms and Signs of acute pulpitis

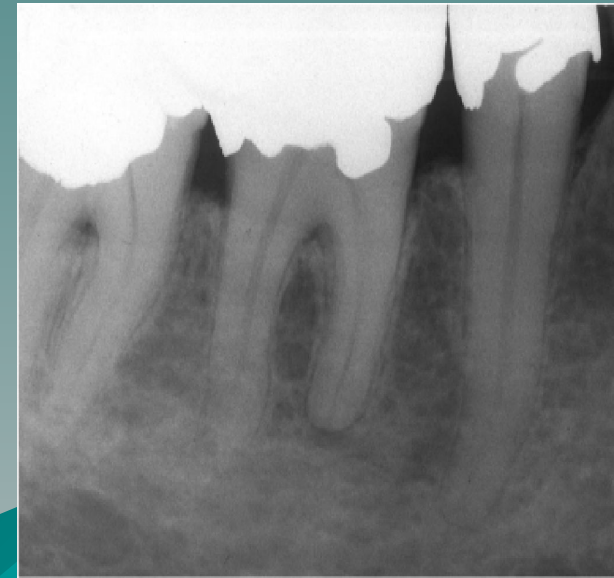
- ◆ The pain not localized in the affected tooth is constant and throbbing → worse by reclining or lying down
- ◆ The tooth becomes painful → with hot or cold stimuli
- ◆ The pain may be sharp and stabbing
- ◆ Change of color is obvious in the affected tooth
- ◆ swelling of the gum or face in the area of the affected tooth





Forms of acute pulpitis

1. Form of **purulent acute** where the pulp is totally inflammed
2. Form of **gangrenous acute** where the pulp begins to die in a less painful manner that can lead into the formation of an abscess



Chronic Pulpitis

1. Reversible
2. Irreversible

Reversible pulpitis

- The pulp is irritated, and the patient is experiencing pain to thermal stimuli
- Sharp shooting pain
- Duration of the pain episode lasts for seconds
- The tooth pulp can be saved
- Usually this condition is caused by average caries

Irreversible pulpitis

- The tooth will display symptoms of lingering pain
- pain occurs spontaneously or lingers minutes after the stimulus is removed
- patient may have difficulty locating the tooth from which the pain originates
- As infection develops and extends through the apical foramen, the tooth becomes exquisitely sensitive to pressure and percussion
- A periapical abscess elevates the tooth from its socket and feels “high” when the patient bites down

Periradicular abscess

An inflammatory reaction to pulpal infection that can be chronic or have rapid onset with **pain**, tenderness of the tooth to **palpation** and **percussion**, pus formation, and **swelling** of the tissues.

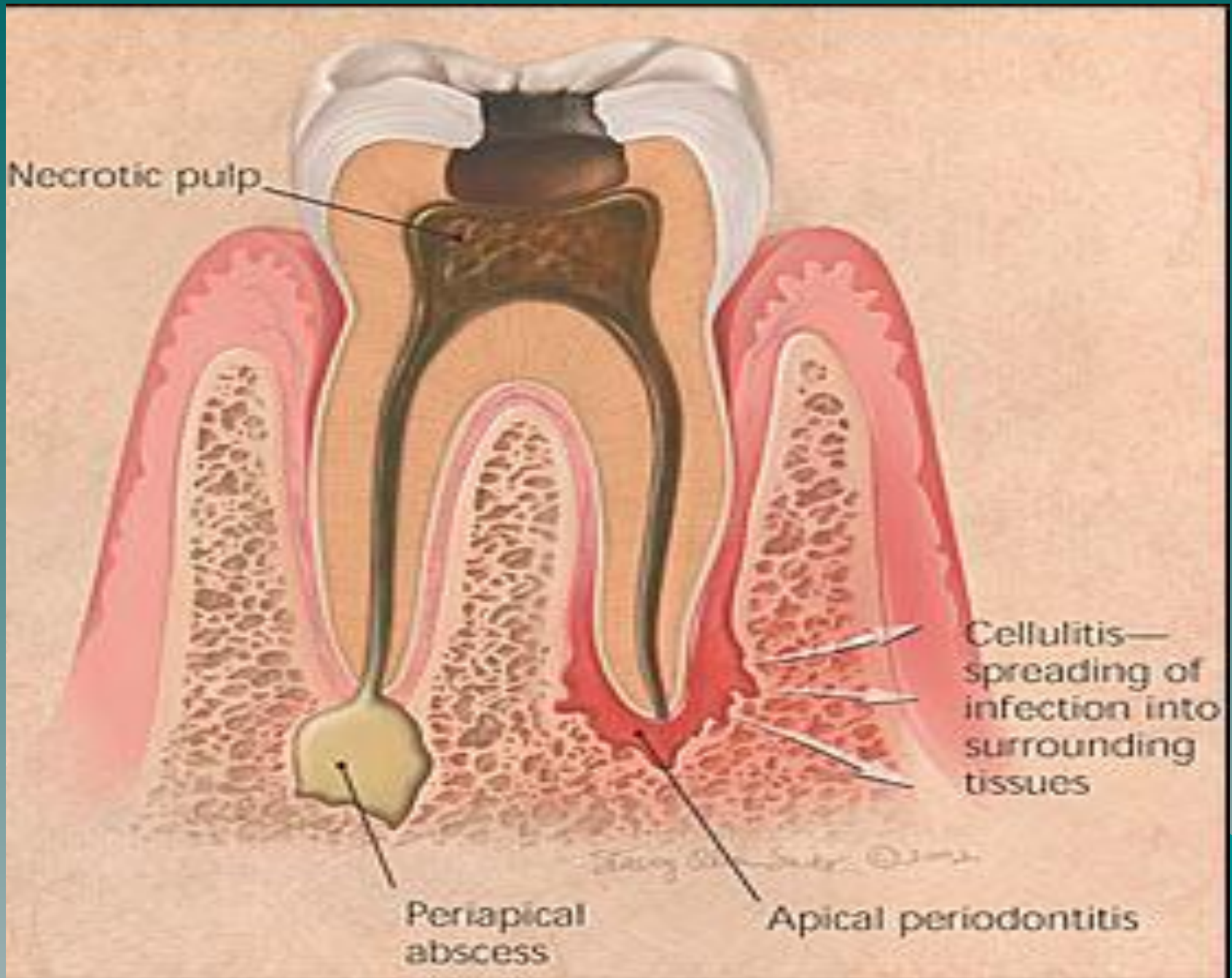




Periodontal abscess

- ◆ An inflammatory reaction frequently caused by bacteria entrapped in the periodontal sulcus for a long time. A patient will experience rapid onset, **pain**, tenderness to **palpation** and **percussion**, pus formation, and **swelling**.
- ◆ Destruction of the periodontium occurs





Necrotic pulp

Cellulitis—
spreading of
infection into
surrounding
tissues

Periapical
abscess

Apical periodontitis

Periradicular cyst

A cyst that develops at or near the root of a necrotic pulp. These types of cysts develop as an inflammatory response to pulpal infection and necrosis of the pulp



Pulp fibrosis

The decrease of living cells within the pulp causing fibrous tissue to take over the pulpal canal



Necrotic tooth

- Also referred to as **non-vital**. Used to describe a pulp that does not respond to sensory stimulus
- Tooth is usually discoloured



Plan of Treatment

- ◆ Depends widely on the diagnosis



Simple plan of treatment

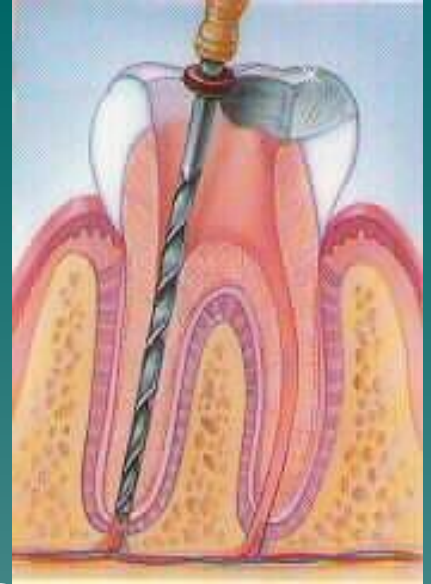
Visit 1:

- ◆ Medical history
- ◆ History of the tooth
- ◆ Access cavity
- ◆ Place rubberdam
- ◆ Extirpation + irrigation with sodium hypochlorite
- ◆ Placed intra-canal medication (calcium hydroxide)
- ◆ Place cotton pellet
- ◆ Placed temporary restoration (IRM/Kalzinol)



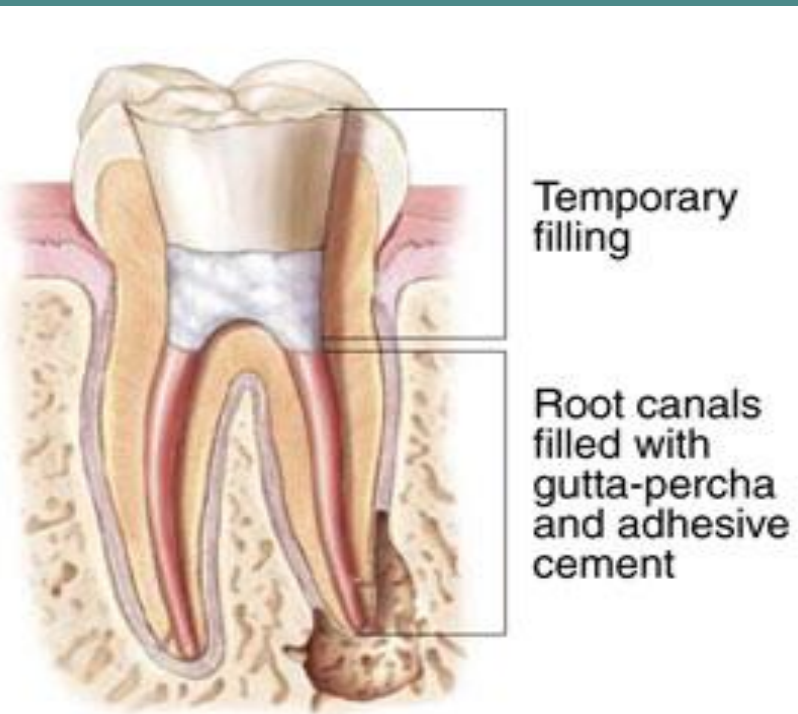
Visit 2:

- ◆ Working length determination
- ◆ Debridement using the hybrid technique
- ◆ Irrigation
- ◆ Placed intra-canal medication (calcium hydroxide)
- ◆ Place cotton pellet
- ◆ Placed temporary restoration (IRM/Kalzinol)

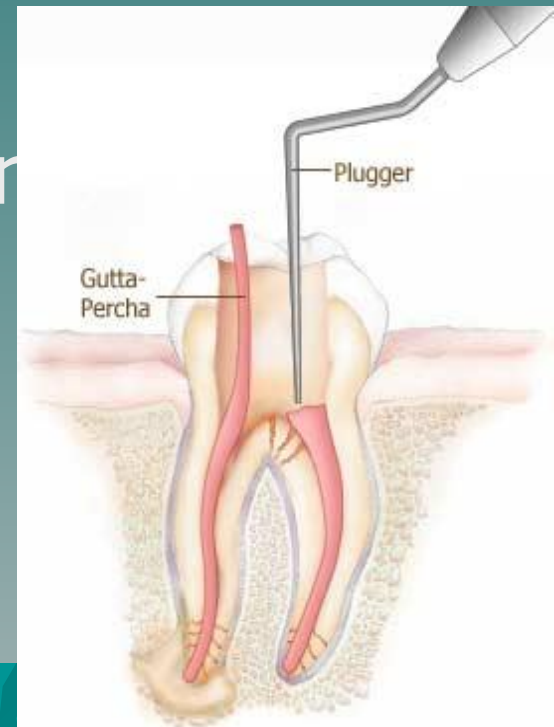


Visit 3:

- ◆ Obturation with GP using lateral condensation



Temporary/permanent
(M/Kalzinol)



Referral


- ◆ To appropriate discipline



Remember

- ◆ Access cavity shapes:
 1. Anterior – inverted triangle
 2. Premolars – round
 3. Molars – rhomboid
- ◆ Always use rubberdam
- ◆ Never to use **Cavit** as a temporary restoration
- ◆ Always place an intra-canal medication....calcium hydroxide!!!
- ◆ Always use RC Prep or Glyde when filing


Contraindications for RCT

- ◆ Caries extending beyond bone level
 - ◆ Rubberdam cannot be placed
 - ◆ Crown of tooth cannot be restored in restorative dentistry nor prosthodontics
 - ◆ Patient is physically/mentally handicapped and therefore cannot follow OH instructions
 - ◆ Putrid OH
 - ◆ Unmotivated patient
 - ◆ Severe root resorption
 - ◆ Vertical root fractures
 - ◆ Cost factor
- 

Inter & cross-departmental diagnosis

- ◆ Mobile teeth
- ◆ Teeth associated with severe periodontal problems
- ◆ Confusion between TMJ dysfunctional symptoms and RCT pain
- ◆ Many decayed teeth
- ◆ Sclerosed canal due to trauma
- ◆ Uncertainty of prognosis related to abscess, severe caries, facial swelling, cellulites, and medical condition of patient

Referral to post-grad clinics

- ◆ Extensive internal or external root resorption
 - ◆ Severely curved, narrow, tortuous canals
 - ◆ Full-mouth rehabilitation required
 - ◆ Multiple exposures due to attrition/abrasion
 - ◆ Problems with occlusion causing the need for RCT
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