Endodontic Diagnosis

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Dental History
Medical History
Pulp Testing
Percussion
Tooth Sleuth
Periodontal Probing
Palpation
Radiographs

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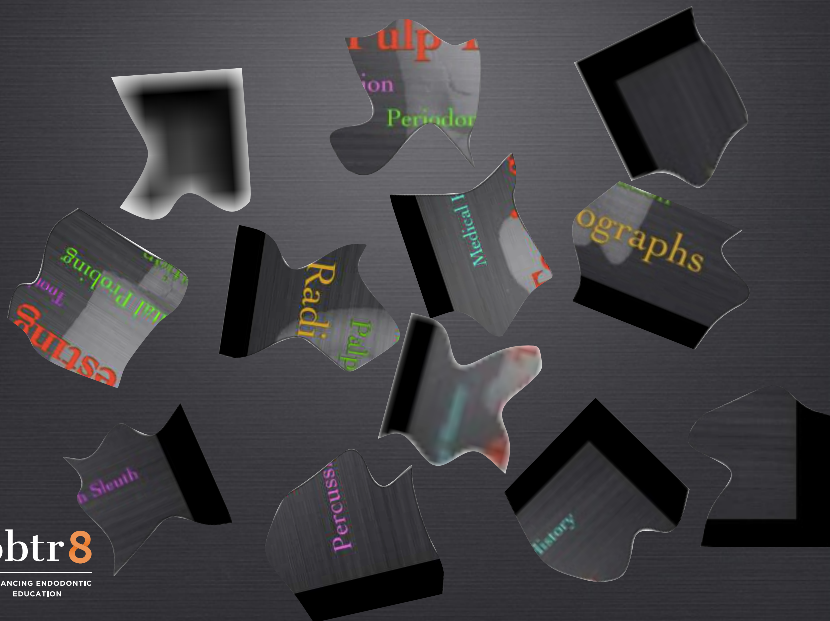

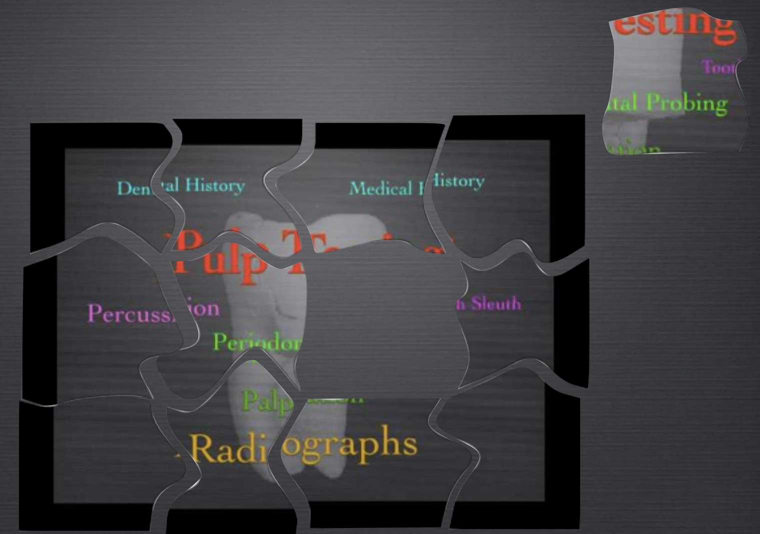

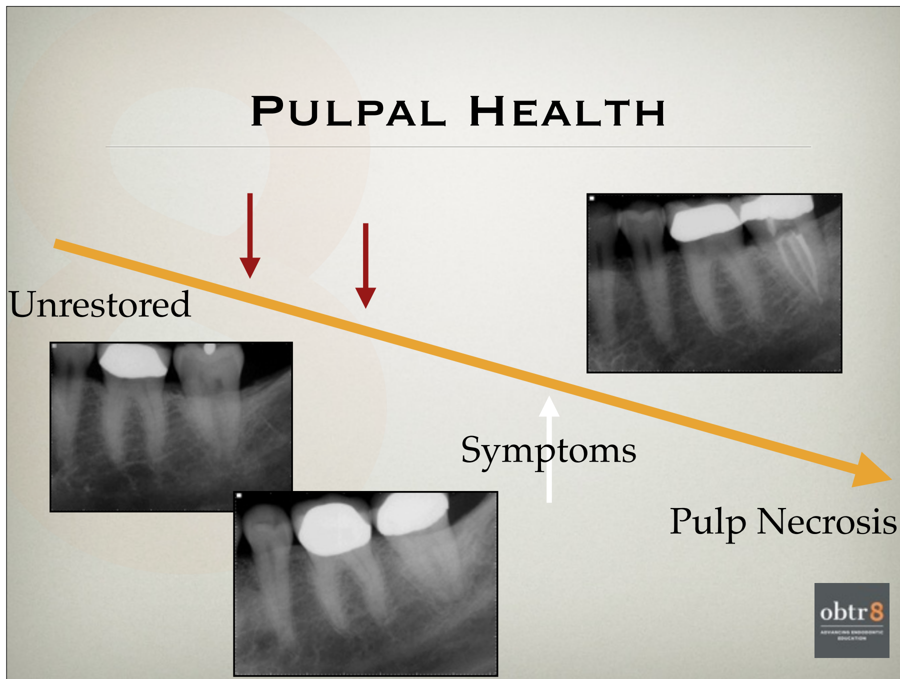

Questions I Ask

1. When did symptoms begin?
acute or long term

2. What are you feeling?
sharp / dull / thermal / spontaneous
scale symptoms 1-10

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Questions I Ask

3. Where are the symptoms ?
localized vs diffuse
(what was first tooth involved if diffuse symptoms)

4. Any recent dental work and if so, where?

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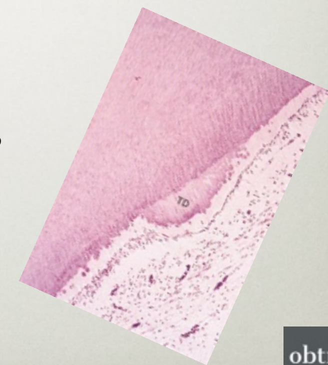
Pulpal

- **Normal**
- **Reversible Pulpitis**
- **Irreversible Pulpitis**
  - **Symptomatic**
  - **Asymptomatic**
- **Necrotic**



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Reversible Pulpitis

Stimulation is uncomfortable to the patient but reverses quickly after irritation

Caries, exposed dentin, recent dental treatment, and defective restorations

Conservative removal of the irritant will resolve the symptoms

Irreversible Pulpitis

Symptomatic

Intermittent or spontaneous pain

Heightened and prolonged episodes of pain even after the thermal stimulus has been removed

sharp or dull
localized or diffuse
referred

Irreversible Pulpitis

Asymptomatic

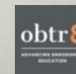
Deep caries may not produce any symptoms

Left untreated, the tooth may become symptomatic or the pulp will become necrotic

Pulp Necrosis

Pulpal blood supply is nonexistent and the pulpal nerves are nonfunctional

Only clinical classification that directly attempts to describe the histologic status of the pulp (or lack thereof)



Pulp Necrosis

Will not respond to electric pulp tests or to cold stimulation

If **heat** is applied for an extended period of time, the tooth may respond to this stimulus

Pulp Necrosis

Partial or complete

May not involve all of the canals in a multirooted tooth

Confusing symptoms

Pulp Necrosis

Bacterial growth can be sustained within the canal

When bacterial toxins extend into the periodontal ligament space, the tooth may become symptomatic to **percussion** or exhibit **spontaneous pain**

Pulp Necrosis

Radiographic changes may occur, ranging from a thickening of the periodontal ligament space to the appearance of a periapical radiolucent lesion

Previously Treated

Has obturating material in canals

May or may not present with signs or symptoms

Will require additional nonsurgical or surgical endodontic procedures to retain the tooth

Previously Initiated Treatment

Pulpotomy or pulpectomy performed before presenting for root canal

Periapical

- **Normal**
- **Asymptomatic Apical Perio**
- **Symptomatic Apical Perio**
- **Acute Apical Abscess**
- **Chronic Apical Abscess**

Normal Apex

Asymptomatic

Tooth responds normally to percussion and palpation testing

Intact lamina dura and periodontal ligament space around all the root apices

Asymptomatic Apical Perio

Apical radiolucency

Presents with no clinical symptoms

Does not respond to pulp vitality tests

This tooth is generally not sensitive to biting pressure but may "feel different" to the patient on percussion

Symptomatic Apical Perio

Painful response to biting pressure or percussion

May or may not respond to pulp vitality tests

May or may not have an apical radiolucency associated with one or all of the roots

Acute Apical Abscess

Painful to biting pressure, percussion, and palpation

Does not respond to any pulp vitality tests

Mobility

Radiograph can exhibit anything from a widened periodontal ligament space to an apical radiolucency

Acute Apical Abscess

Swelling

Fever
Lymph node tenderness

Chronic Apical Abscess

Usually asymptomatic

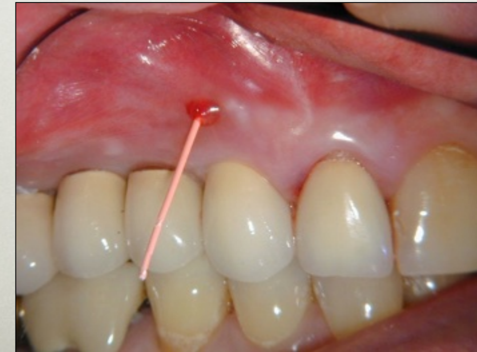
Does not respond to pulp vitality tests

Apical radiolucency

Not sensitive to biting pressure but can "feel different" to the patient on percussion

Chronic Apical Abscess

Sinus tract



Testing Goals

- Repeatable
- Redundancy
- Chief Complaint

Pulp Testing

- **Thermal**
- **Electric**
- Laser Doppler Flowmetry (LDF)
- Pulse Oximetry
- Test Cavity
- Selective Anesthesia

Pulp Testing Considerations

Find a normally responsive tooth (if possible)

Compare suspected culprit to a tooth with a similar restorative history

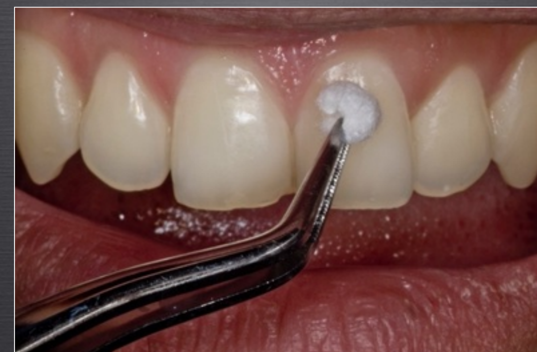
Thermal

- Cold
  - CO_2 snow (-108° F/ -75° C)
  - Endo Ice (-14° F/ -50° C)
- Heat ?

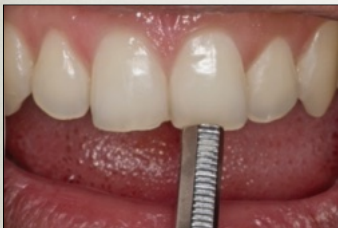
EPT

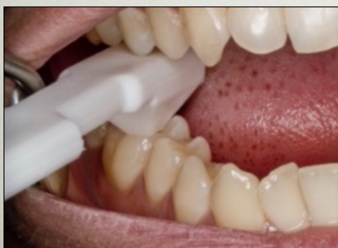
Response by the pulp to the electric current only denotes that some viable nerve fibers are present in the pulp and are capable of responding

Pulp Testing



Periapical Testing

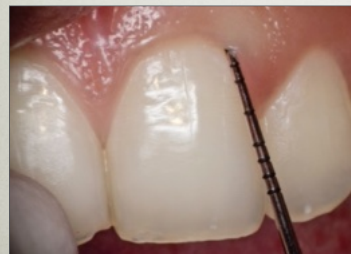


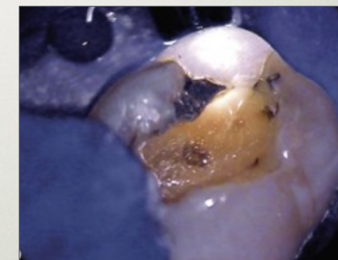


- Percussion
- Palpation
- Bite Stick

Other Testing

- Periodontal Probing
- Transillumination





Limitations of pulp testing

The vitality of the pulp is determined by the health of the **vascular supply**, not the status of the pulpal nerve fibers

Sensibility Testing is not vitality testing

No Proprioception

Clinical Research

Frequency of Localization of the Painful Tooth by Patients Presenting for an Endodontic Emergency

Patrick J. McCarthy, DDS, MS, Scott McClanahan, DDS, MS, James Hodges, PhD, and Walter R. Bowles, DDS, MS, PhD

Abstract

JOE 2010

Patients can localize painful tooth 73.3%

89% if periradicular

Limitations of pulp testing

ENDODONTICS

The American Association of Endodontists

THE DYNAMICS OF PULP INFLAMMATION: CORRELATIONS BETWEEN DIAGNOSTIC DATA AND ACTUAL HISTOLOGIC FINDINGS IN THE PULP

-Not a good correlation between the objective clinical signs and symptoms and the pulpal histology

-No proprioception in pulp

Oral Sx 1963

Limitations of pulp testing

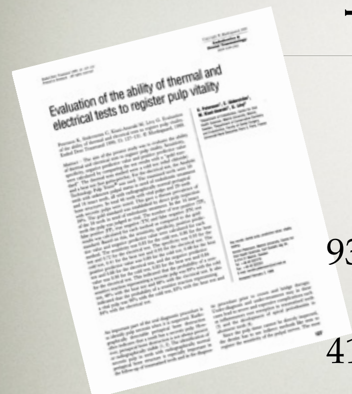
Evaluation of the ability of thermal and electrical tests to register pulp vitality

Sensitivity is ability of a test to identify teeth that are diseased

Cold test correctly identified 83% of the teeth that had a necrotic pulp
Heat 86%
Electric pulp tests 72%

T Petersson K, Soderstrom C, Kiani-Anaraki M, Levy G: Evaluation of the ability of thermal and electric tests to register pulp vitality. Endod Dent Traumatol 1999; 15:127. ext

Limitations of pulp testing


Evaluation of the ability of thermal and electrical tests to register pulp vitality

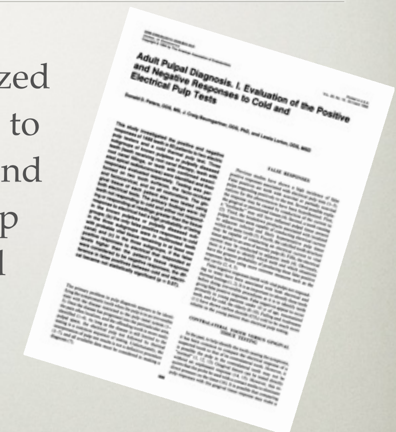
Specificity is the ability of a test to identify teeth without disease

93% were correctly identified by both cold and EPT
41% of the teeth with healthy pulps were identified correctly by the heat test

T Petersson K, Soderstrom C, Kiani-Anaraki M, Levy G: Evaluation of the ability of thermal and electric tests to register pulp vitality. Endod Dent Traumatol 1999; 15:127. ext

Limitations of pulp testing

If a mature, untraumatized tooth does not respond to both electric pulp test and cold test, then the pulp should be considered necrotic


Adult Pulpal Diagnosis. I. Evaluation of the Positive and Negative Responses to Cold and Electrical Pulp Tests

Peters DD, Baumgartner JC, Lorton L: Adult pulpal diagnosis. 1. Evaluation of the positive and negative responses to cold and electric pulp tests. *J Endod* 1994; 20:506