The most accepted theory as to the cause of root sensitivity is the:

- Bayer's theory
- Chemiosmotic theory
- Hydrodynamic theory
- Quantum theory

Hydrodynamic theory

The **Hydrodynamic theory** postulates that the pain of root sensitivity results from indirect innervation caused by **dentinal fluid movement in the tubules,** which stimulates mechanoreceptors in the pulp.

Root hypersensitivity is a relatively common problem in periodontal practice. It may occur spontaneously when the root becomes exposed as a result of gingival recession or pocket formation, or it may appear after scaling and root planing and surgical procedures. **The primary symptom is cold sensitivity.** Plaque and food debris, if allowed to remain on exposed root surfaces, often lead to increased sensitivity. **Note:** To reduce the sensitivity to thermal change after removal of a periodontal dressing, it is best to keep the roots **free of plaque.**

The most common agents used by the patient for oral hygiene are **dentifrices.** Although many dentifrice products contain fluoride, additional active ingredients for desensitization are strontium chloride, potassium nitrate, and sodium citrate. The ADA has approved the following dentifrices for desensitizing purposes: Sensodyne and Thermodent, which contain strontium chloride, Crest Sensitivity Protection, Denquel, and Promise, which contain potassium nitrate; and Protect, which contains sodium citrate.

Important: Desensitizing agents act through the precipitation of crystalline salts on the dentin surface, which block dentinal tubules.

Various office treatments for the desensitization of hypersensitive dentin:

- Cavity varnishes
- Anti-inflammatory agents
- Treatments that partially obturate dentinal tubules
  - Burnishing of dentin
  - Silver nitrate
  - Zinc chloride-potassium ferrocyanide
  - Formalin
  - Calcium compounds:
    - Calcium hydroxide
    - Dibasic calcium phosphate
  - Fluoride compounds
    - Sodium fluoride
    - Stannous fluoride
  - Iontophoresis
  - Strontium chloride
  - Potassium oxalate
  - Restorative agents
  - Dentin bonding agents