Demineralization and Its Treatment in Fixed Orthodontic Treatment

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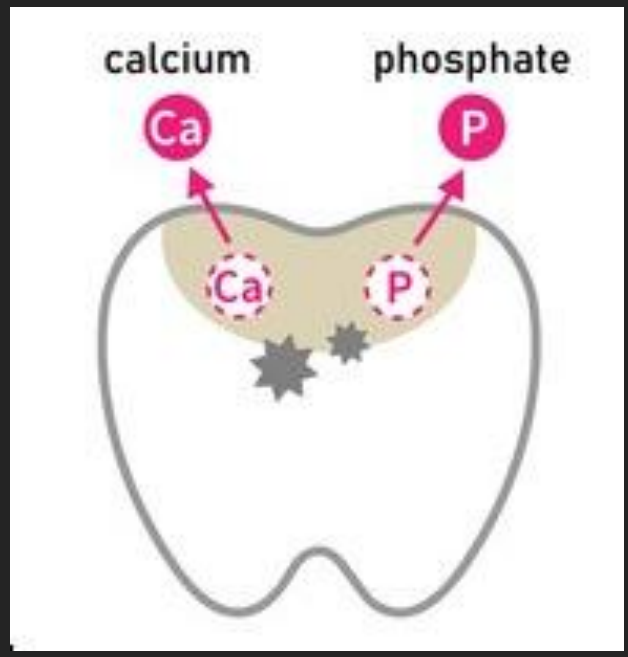
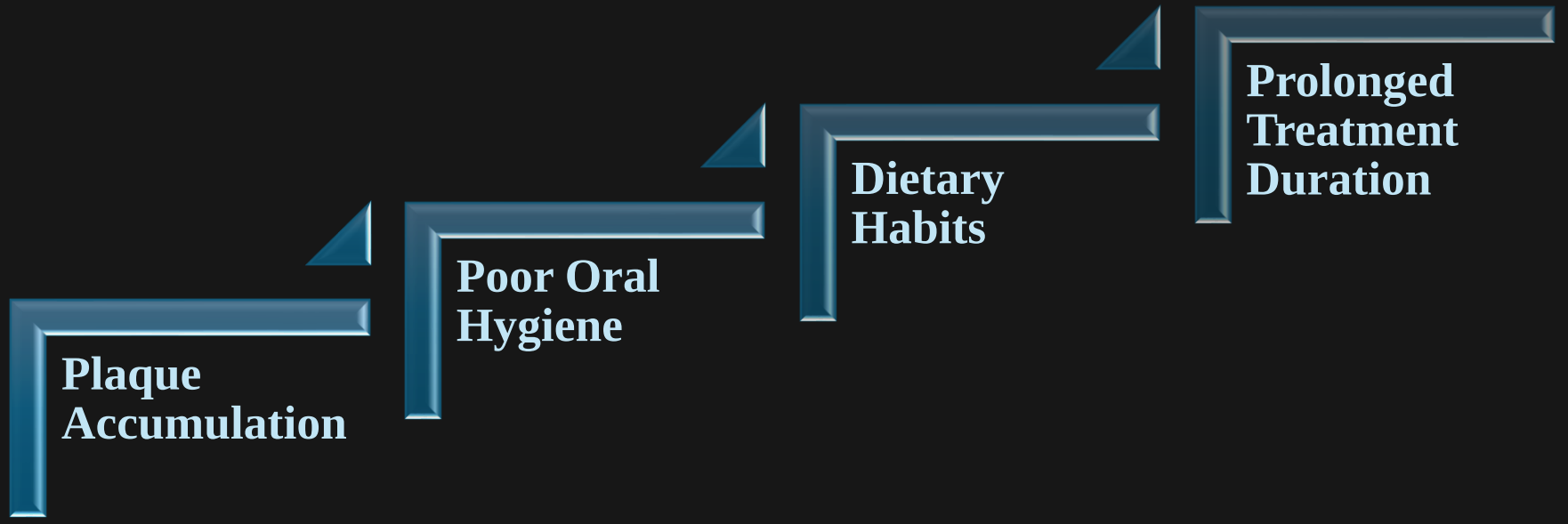
- Demineralization refers to the loss of minerals, primarily Calcium and Phosphate, from the tooth enamel, leading to the weakening and possible decay of the enamel



Causes of Demineralization During Fixed Orthodontic Treatment



Symptoms of Demineralization

Early enamel demineralization manifests clinically as “white spot lesions”

The first sign of a caries lesion on enamel that can be detected with the naked eye. The milky white appearance is caused by an increased scattering of light as a result of the loss of crystal structure and is exaggerated when the enamel is dried

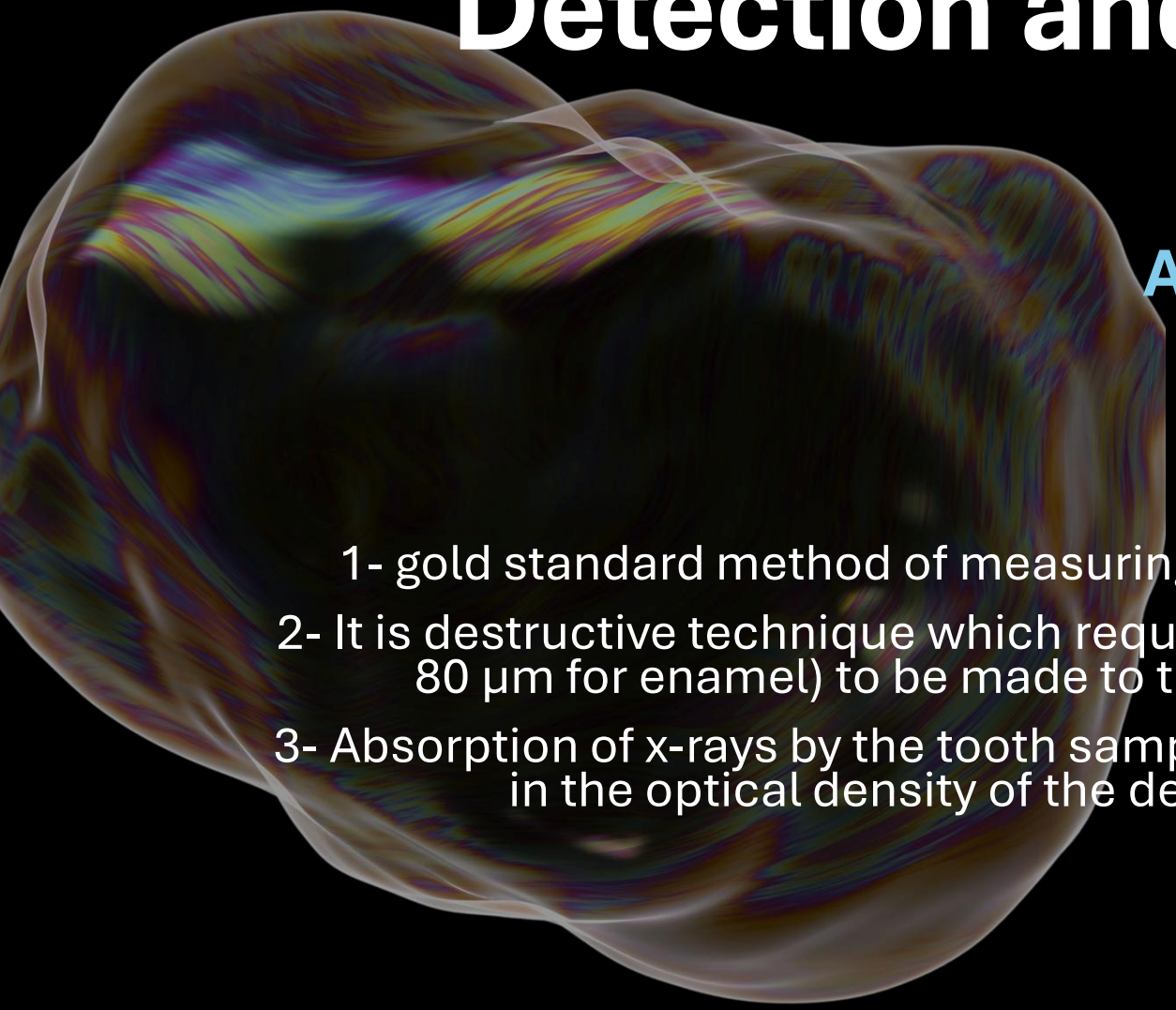
Demineralization formation

- After 14 days of completely undisturbed plaque, enamel changes are visible with air drying.
- After 3 to 4 weeks the outermost sur face exhibits further porosity and clinical changes can be seen without air drying

Prevalence

- The reported proportion of patients with DLs after fixed orthodontic treatment varies widely in the literature between 2% to 96%.
- Al Maaitah et al. (2011) described a prevalence of 71.7% DLs in 230 participants after orthodontic treatment. This was determined using a technique called Quantitative Light-Induced Fluorescence or, which has a high sensitivity for detecting DLs.
- Julien et al. (2013) stated an incidence of 23.4% DLs in 885 participants using digital photography.

Detection and Measurement



A- Transverse Microradiography

1- gold standard method of measuring demineralization and remineralization

2- It is destructive technique which requires planoparallel sections (approximating 80 μm for enamel) to be made to the enamel are removed for analysis.

3- Absorption of x-rays by the tooth sample and the step wedge is directly reflected in the optical density of the developed film (microradiograph).

Detection and Measurement

B- Quantitative Light-Induced Fluorescence–Digital

1- It is a novel device based on QLF technology.

2- It takes two successive images, a white light image, which is a conventional digital photograph, and a QLF image.

Prevention is Key

Treatment of Demineralization Associated with Fixed Orthodontic Treatment

1- Improved Oral Hygiene Practices

A- Brushing and Flossing
B- Interdental brushes

Treatment of Demineralization Associated with Fixed Orthodontic Treatment

2- Fluoride use

A- Fluoride Toothpaste
B- Fluoride Gel or Varnish
C- Fluoride Mouth Rinses

Treatment of Demineralization Associated with Fixed Orthodontic Treatment

3- Calcium and Phosphate

A- Casein Phosphopeptide-Amorphous Calcium Phosphate (CPP-ACP)

B- Hydroxyapatite Products

Treatment of Demineralization Associated with Fixed Orthodontic Treatment

4- Sealants:

- Dental sealants

Treatment of Demineralization Associated with Fixed Orthodontic Treatment

5- Dietary Modifications

- Reducing Sugar Intake
- Chewing Sugar-Free Gum

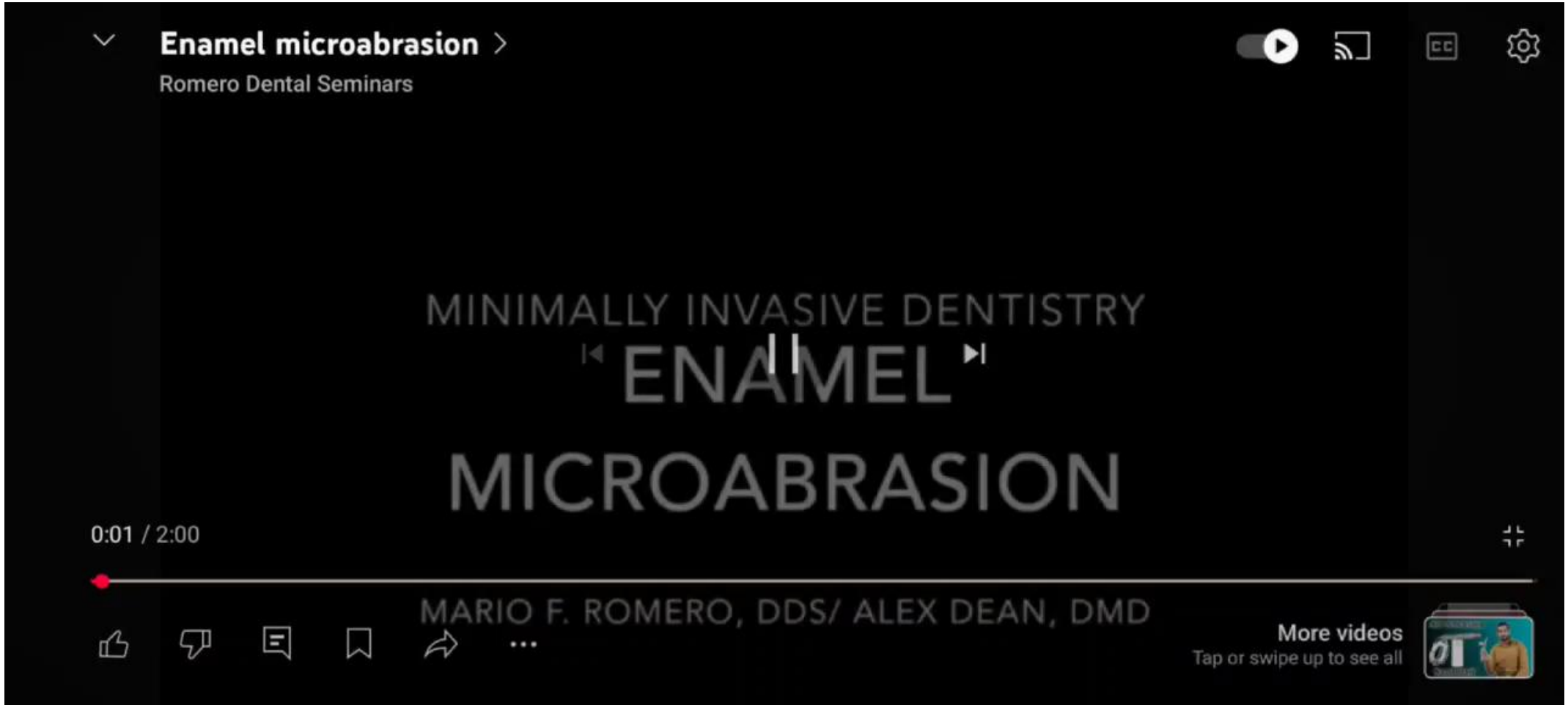
Treatment of Demineralization Associated with Fixed Orthodontic Treatment

6- Regular visits and check-up with orthodontist

Treatment of Demineralization Associated with Fixed Orthodontic Treatment

7- Treatment of white spot lesion

- By using fluoride or calcium-based pastes can be combined with cosmetic procedures like microabrasion or resin infiltration.


Enamel microabrasion
Romero Dental Seminars
MINIMALLY INVASIVE DENTISTRY
ENAMEL
MICROABRASION
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MARIO F. ROMERO, DDS/ ALEX DEAN, DMD
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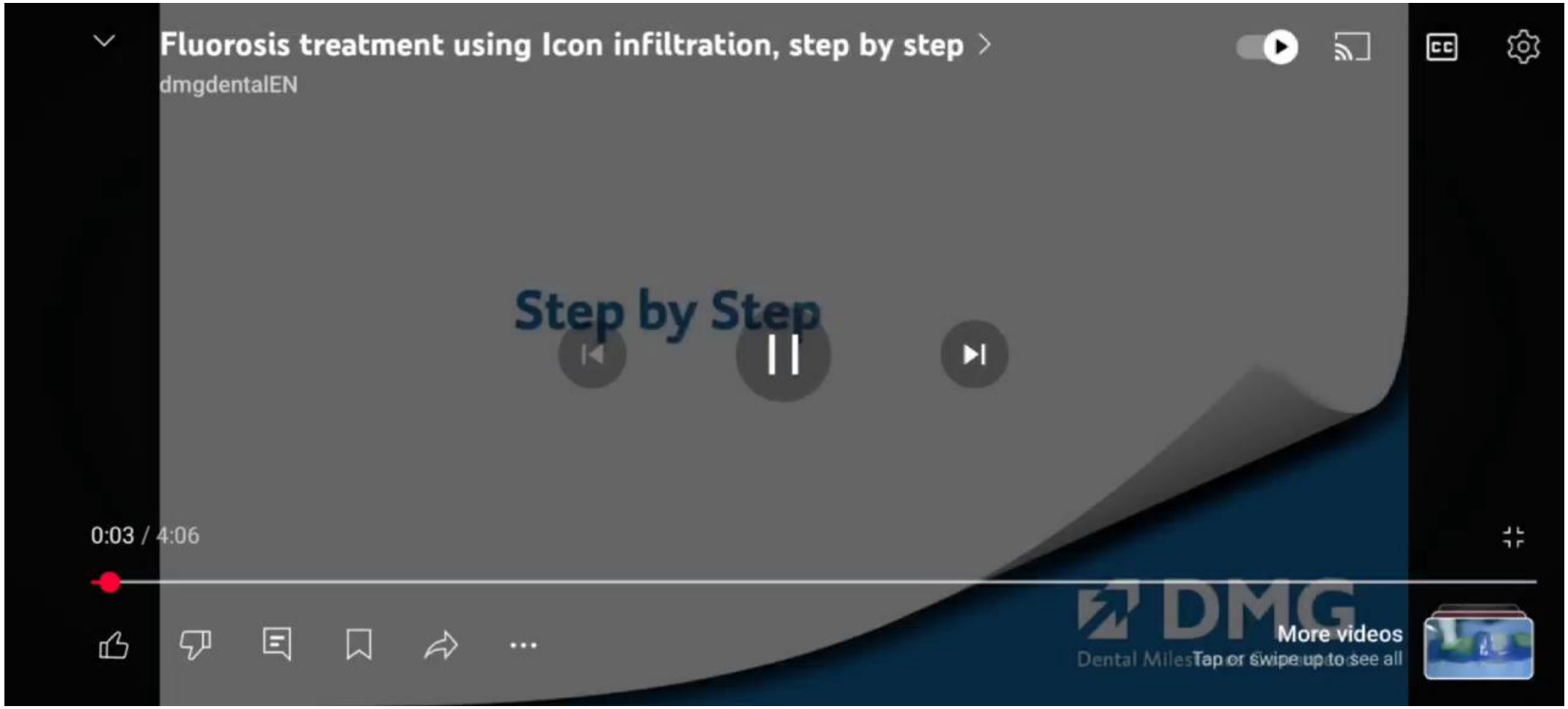
Tap or swipe up to see all

Resin infiltration.

Component	Chemical Name	Function
ICON Infiltrant	Triethylene Glycol Dimethacrylate (TEGDMA)	Penetrates and seals enamel lesions
	Camphorquinone (CQ) + amines	Light-activated polymerization
	BHT (Butylated Hydroxy Toluene)	Stabilizer / Inhibitor
ICON Etch	15% Hydrochloric Acid (HCl) Gel	Removes superficial enamel layer
ICON Dry	99% Ethanol	Dehydrates lesion for better resin infiltration


Fluorosis treatment using Icon infiltration, step by step
dmgdentalEN
Step by Step
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DMG
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The newer technologies used for the treatment of demineralization

1. Laser Technology

- Diode Lasers

- Er:YAG Lasers

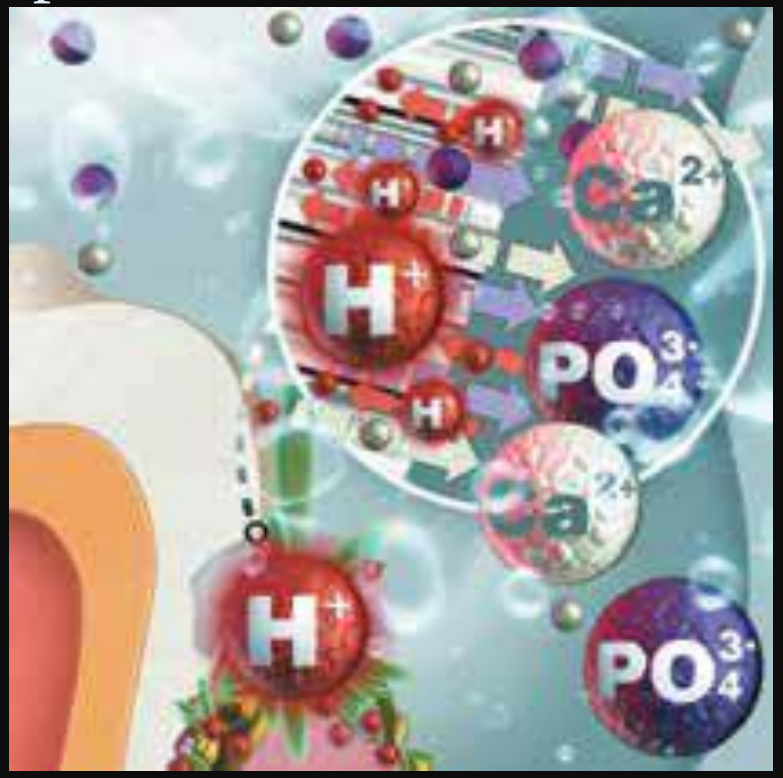
2. Laser Fluorescence for Early Detection

- Diagnodent (Laser Fluorescence Technology)

Range	Category
0-10	Healthy Tooth Structure
11-20	Outer Half Enamel Caries
21-30	Inner Half Enamel Caries
30+	Dentin Caries

3. Remineralization Gels and Pastes with Advanced Technology

Recaldent (CPP-ACP): Recaldent is an advanced calcium phosphate paste containing casein phosphopeptide-amorphous calcium phosphate (CPP-ACP)



4- Nanotechnology-Based Remineralization

- Nanohydroxyapatite

5. Ozone Therapy

Thank you