

The Profession of Dentistry

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The Profession of Dentistry

- My Story
- Dive into the World of Dentistry
- Dental Specialties
- Tooth Decay 101



My Story

- University of Delaware (Graduated 1992)
- Mentor(s)
- Worked for a year at Astra Zeneca
- Dental Admission Test (DAT)
- University of Maryland, School of Dentistry (Graduated 1997)
- Christiana Care General Practice Residency (Graduated 1998)
- Private Practice

University of Delaware

- Graduated with a degree in Political Science
- Grant studying the Delaware Constitution
- My passion for science started with an Ecology class
- Stayed an extra year and acquired the necessary prerequisite classes for dental school
- Interviewed with professors to get a letter of recommendation from the University



Mentors

- My father's friend was a dentist and he became my mentor
- You need someone who has experience, who can be trusted, and someone that has gone down this similar path
- Reach out to your family dentist or shadow at an office



Astra Zenaca

- My Senior year summer
- Performed dissections on animals for urinary incontinence and pulmonary hypertension
- Great hand eye training for dental school

Dental Admission Test

- Natural Sciences (Biology, general chemistry, organic chemistry)
- Perceptual Ability (two and three dimensional problem solving)
- Reading Comprehension (dental and basic sciences)
- Quantitative Reasoning (mathematical problems, conversions)
- Accepted by 66 dental schools in the US
- 4.5 hour exam
- Prep classes recommended
- Timing of the exam should be considered
- Biology section is the toughest to prepare for due to the volume of material.



University of Maryland, School of Dentistry

- 4 Year program
- First two years were the course work in the sciences and dentistry along with labs that prepare you for the clinical years.
- The last two years you are in the clinic working on patients and course work focused on dentistry.
- Took two written board exams: Part 1 and Part 2
- You had to perform a defined number of procedures for graduation.
- Clinical Board is required to gain licensure.

General Practice Residency



- One year hospital-based residency in general dentistry
- Anesthesia rotation
- Emergency medicine rotation
- Oral medicine rotation
- Oral surgery rotation
- On call schedule for dental emergencies
- General dentistry performed in the dental clinic
- Lectures covering a wide array of dental topics
- Provides practical experience in emergency and multidisciplinary comprehensive oral healthcare
- Exposes you to a wide variety of case including patients with special needs and medically complex patients
- Understand the oral health needs of communities and take part in community service
- Function effectively within the hospital and other health-care environments

General Practice Dentistry

General Dentists:

- Worked as an associate and owner
- Provide a wide range of comprehensive oral health care services such as restorations, crowns/bridges, sealants, teeth whitening, cosmetic bonding, dental implants, emergency dental care
- Diagnose and treat plan for common dental issues
- Typically the first point of contact for individuals seeking dental care
- GP's make up 78.2% of the dental profession
- Refer patients to specialists and direct the multidisciplinary team when treating complex cases. Act as the “quarterback” for these cases.

Dental Specialties

- **Endodontics (1983)**: This area focuses on dental pulp and periradicular tissues. Endodontists primarily perform root canals.
- **Orthodontics and Dentofacial Orthopedics (2003)**: If you want to straighten your teeth, you need an orthodontist. Dentofacial orthopedic specialists correct facial deformities using many of the same types of appliances used in teeth straightening therapy.
- **Pediatric Dentistry (1995)**: Pediatric dentists provide dental care for infants, children and teenagers.
- **Periodontics (1992)**: The ADA defines this as the prevention, diagnosis and treatment of diseases of the tissues around the teeth – the gums, that is.
- **Prosthodontics (2003)**: Prosthodontists provide restorative dental procedures including dental implants, crowns, bridges, and dentures. They also perform cosmetic dental treatments.
- **Oral and Maxillofacial Pathology (1991)**: This specialty concerns diseases affecting the oral and maxillofacial regions.
- **Oral and Maxillofacial Radiology (2001)**: Oral and maxillofacial radiologists analyze radiographic images (x-rays) for issues of the maxillofacial area.
- **Oral and Maxillofacial Surgery (1990)**: Oral surgeons perform surgery on the teeth, jaw, face, and gums. These include facial reconstruction, cleft lip and palate correction, bone grafting, dental implants, and impacted teeth.
- **Dental Public Health (1976)**: This discipline focuses on the prevention and treatment of dental diseases and promoting dental health through community effort.

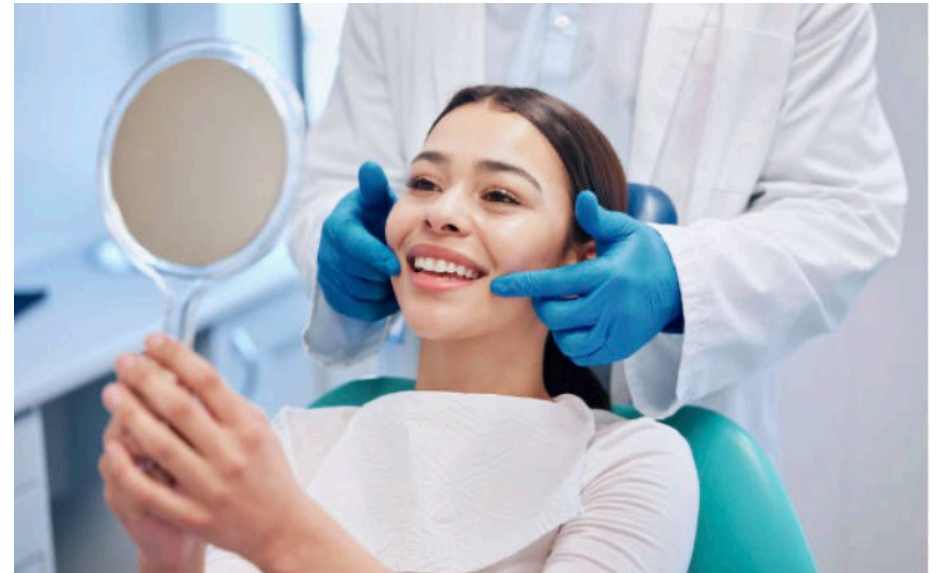
So, let's dive into the world of dentistry and learn more about it!

❖ What is Dentistry?

Dentistry is a branch of medicine that focuses on the health of your teeth and gums. Dentists are the professionals who specialize in the the oral cavity and related structures. They are responsible for diagnosing, preventing, and treating oral health problems.

❖ Why is Oral Health Important?

Oral health is important because it affects your overall health. Your mouth is the entry point for many of the things that enter your body, including food, water, and air. Poor oral health can lead to problems like tooth decay, gum disease, and bad breath. In severe cases, it can contribute to heart disease, stroke, and other health problems.



Dental Caries: AKA Tooth Decay or Cavities

So, what exactly is Dental Caries?

- It is a common problem that affects people of all ages.
- It is a disease that occurs when bacteria in the mouth produce acids that dissolve the hard outer layer of the teeth, called enamel.
- Over time, these acids can create a hole, or cavity, in the tooth.
- If left untreated, the cavity can become larger and deeper, leading to pain, infection, and even tooth loss.

Factors that Contribute to the Development of Dental Caries

There are several factors that contribute to the development of dental caries.

1. The most important factor is **poor oral hygiene**, which allows bacteria to accumulate and produce the acids that cause tooth decay.
2. A diet high in sugar and carbohydrates
3. A lack of fluoride in the water and toothpaste
4. Certain medical conditions that reduce the flow of saliva, which helps to protect the teeth.



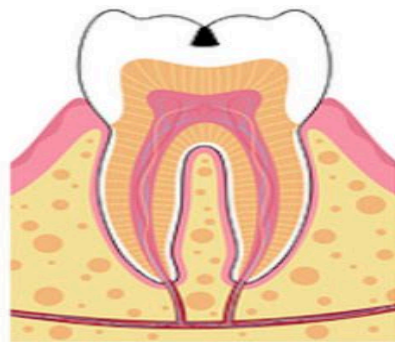


Stages of Tooth Decay

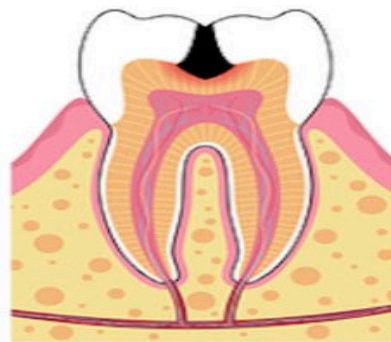
1. **Initial Demineralization:** This is the earliest stage
2. **White Spots:** These may appear on the tooth's surface. This is a sign of early decay. It is important to address by improving oral care and diet.
3. **Enamel Decay:** As decay progresses, the enamel is further eroded.
4. **Dentin Decay:** The decay reaches the dentin which is the layer beneath the enamel.
5. **Pulp Involvement:** Decay reaches the pulp which contains nerves and blood vessels. This stage is painful.
6. **Abscess Formation:** An abscess can develop at the root of the tooth.



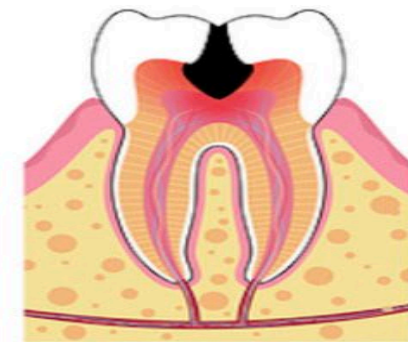
White Spot



Enamel Decay



Dentin Decay



Involvement of The Pulp

What is Streptococcus Mutans?

- ❖ Streptococcus mutans is a type of bacteria commonly found in the human oral cavity. It is considered to be one of the primary etiological agents in the development of dental caries, which is the most prevalent oral disease worldwide.
- ❖ S. mutans is able to colonize the surfaces of teeth, particularly in areas where there is a buildup of plaque. Once it has colonized the tooth surface, S. mutans produces acid as a byproduct of its metabolism of carbohydrates, particularly sugars. This acid production causes a drop in the pH of the surrounding environment, leading to demineralization of the tooth enamel.
- ❖ Over time, this demineralization can progress to the point where a cavity is formed. S. mutans is also able to produce glucans, which are sticky polysaccharides that allow the bacteria to adhere more firmly to tooth surfaces, further contributing to the formation of dental plaque and caries.
- ❖ In addition to its ability to produce acid and adhere to tooth surfaces, S. mutans is able to form biofilms, which are complex communities of bacteria that are embedded in a matrix of extracellular polymeric substances. These biofilms are resistant to mechanical removal, as well as to the action of many antimicrobial agents, making them difficult to treat.

Strategies to Promote Remineralization of Tooth Structure

Effective prevention and management of dental caries requires a multifactorial approach that includes measures to control the growth and activity of *S. mutans*, as well as strategies to promote remineralization of the tooth structure. Remineralization is the process by which minerals, such as calcium and phosphate, are deposited back into the tooth structure, thus repairing and strengthening the enamel.

There are several strategies that can be used to promote remineralization of tooth structure, including:

- 1. Fluoride treatments:** Can be applied topically to the teeth in the form of toothpaste, mouthwash, or professional fluoride varnish treatments. Fluoride also inhibits demineralization and enhances remineralization at the crystal surface. The resulting remineralized layer is resistant to acid attack. It also inhibits bacterial enzymes.
- 2. Dental Sealants:** Dental sealants are thin plastic coatings that are applied to the chewing surfaces of teeth, particularly molars, to protect them from decay. They help to prevent food and bacteria from getting trapped in the grooves of the teeth, reducing the risk of decay and promoting remineralization.
- 3. Calcium and Phosphate Supplements:** Calcium and phosphate are essential minerals for tooth remineralization. Supplements in the form of mouth rinses, toothpaste, or professionally applied treatments can help to deliver these minerals to the teeth.

Strategies to Promote Remineralization of Tooth Structure, cont.

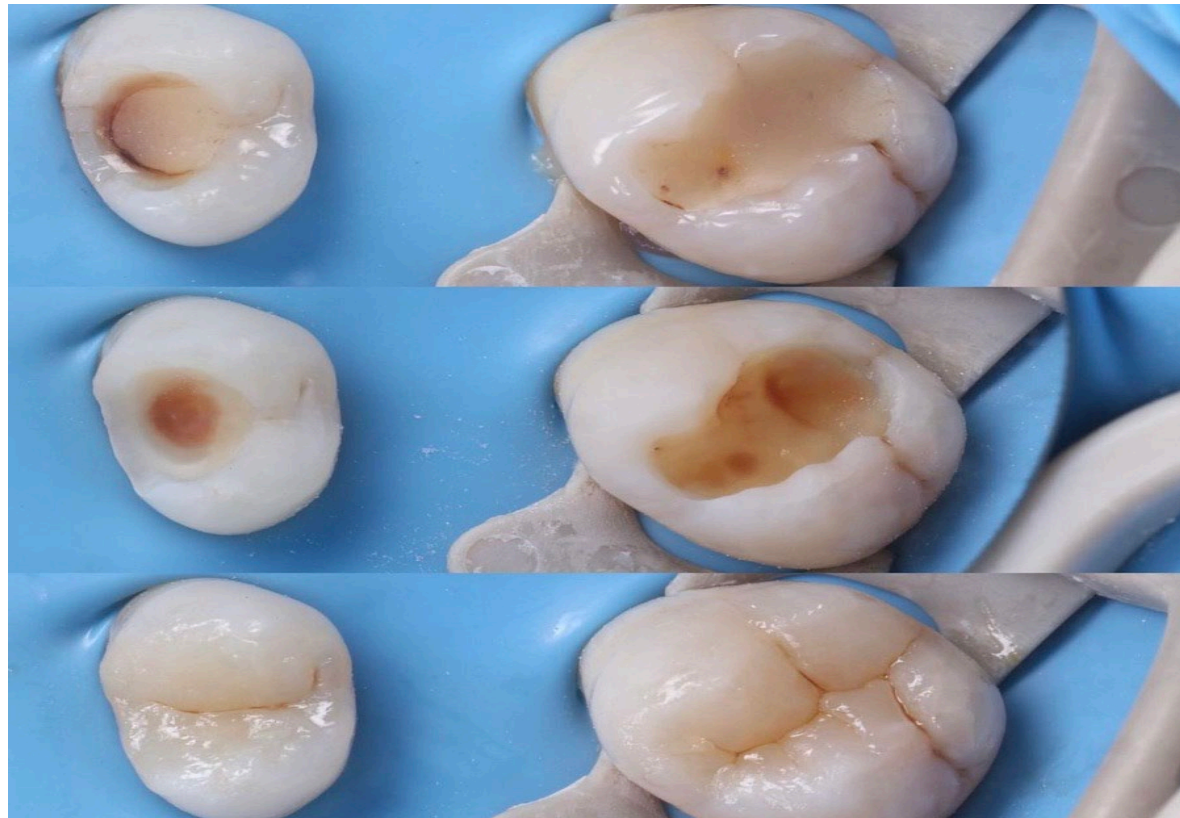
- 4. Xylitol:** Xylitol is a sugar substitute that has been shown to reduce the growth of *S. mutans*, and thus, the risk of decay. It is often found in sugar-free gum or mints and can be used as a dietary supplement. Xylitol is converted into xylitol 5-phosphate (X5P) after its uptake into bacterial cells and X5P may inhibit bacterial metabolism, including acid production. Thus, xylitol retards growth of *S. mutans*.
- 5. Oral Hygiene Practices:** Regular brushing and flossing help to remove food particles and plaque from the teeth, reducing the risk of decay and promoting a healthy oral environment for remineralization to occur.

It is important to note that these strategies are most effective when used in conjunction with a healthy diet and regular dental checkups to monitor and treat any early signs of decay.

Treatment and Restoration of Dental Caries

Dental caries can be restored or treated in various ways, depending on the severity and extent of the decay. Here are some of the most common ways to restore dental caries.

- 1. Dental Fillings:** Dental fillings are the most common way to restore teeth that have been affected by caries. The decayed area is removed and replaced with a filling material, such as composite resin or amalgam



Step 1



Step 2



Step 3



Step 4



Step 5



Step 6



Treatment and Restoration of Dental Caries, cont.

- Dental Crowns:** Dental crowns are used to restore teeth that have extensive decay or damage. The decayed or damaged portion of the tooth is removed and covered with a crown, which is a custom-made cap that covers the entire tooth.



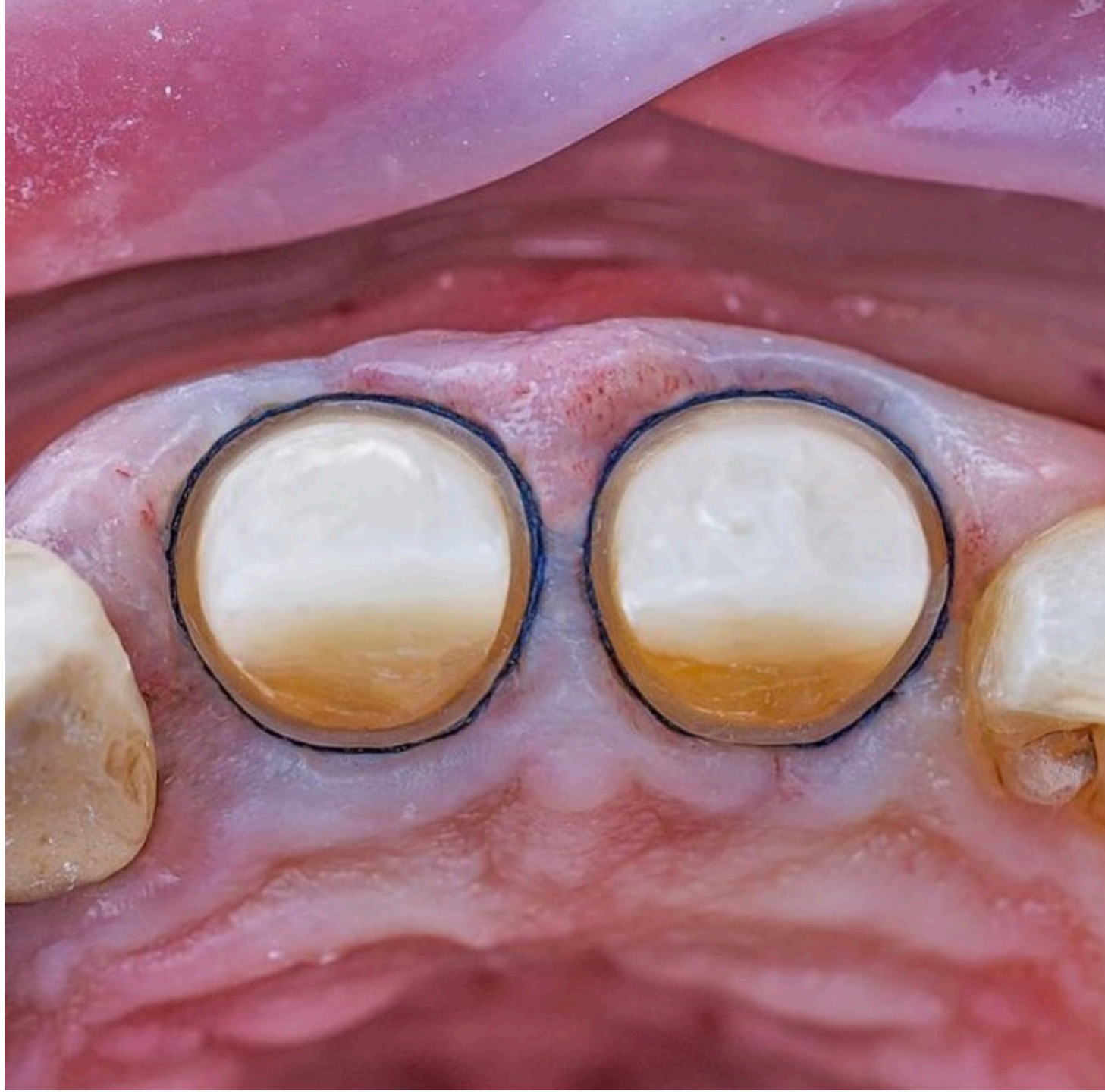
Step 1



Step 2



Step 3



Step 4



Treatment and Restoration of Dental Caries, cont.

- 3. Root Canal Therapy:** Root canal therapy is used to treat teeth that have decay that has reached the pulp, or inner portion, of the tooth. The decayed tissue is removed, and the tooth is filled and sealed to prevent further infection.

Step 1



Step 2



Step 3



Treatment and Restoration of Dental Caries, cont.

Root canal therapy continued.....

Step 4



Step 5



Step 6



Treatment and Restoration of Dental Caries, cont.

4. **Dental Implants:** Dental implants are used to replace teeth that have been lost due to decay or other factors. A small metal post is placed into the jawbone, and a custom-made artificial tooth is attached to the post.



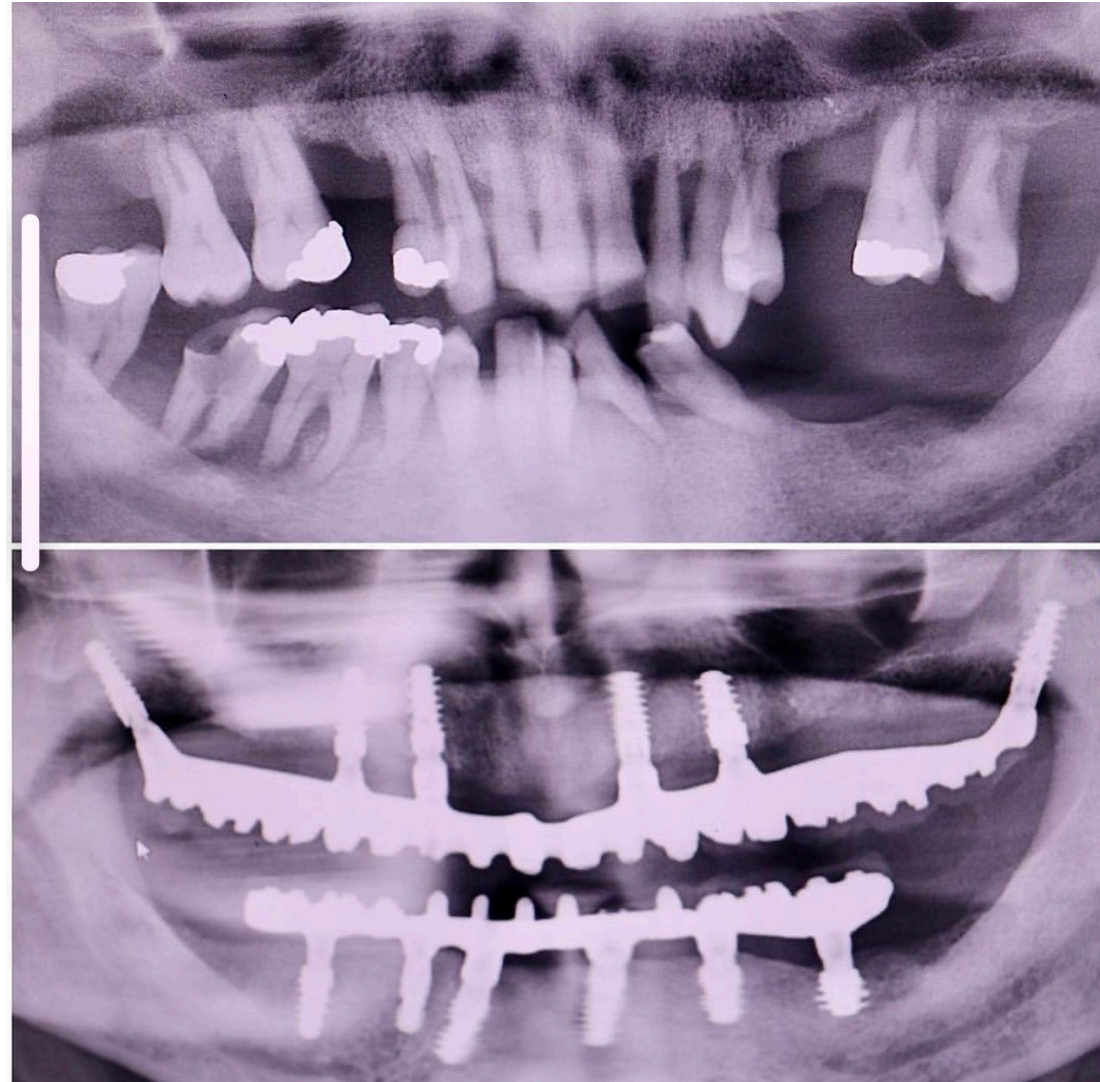
Treatment and Restoration of Dental Caries, cont.

Dental Implants continued.....



Treatment and Restoration of Dental Caries, cont.

Dental Implants continued....



Treatment and Restoration of Dental Caries, cont.

Dental Implants continued.....



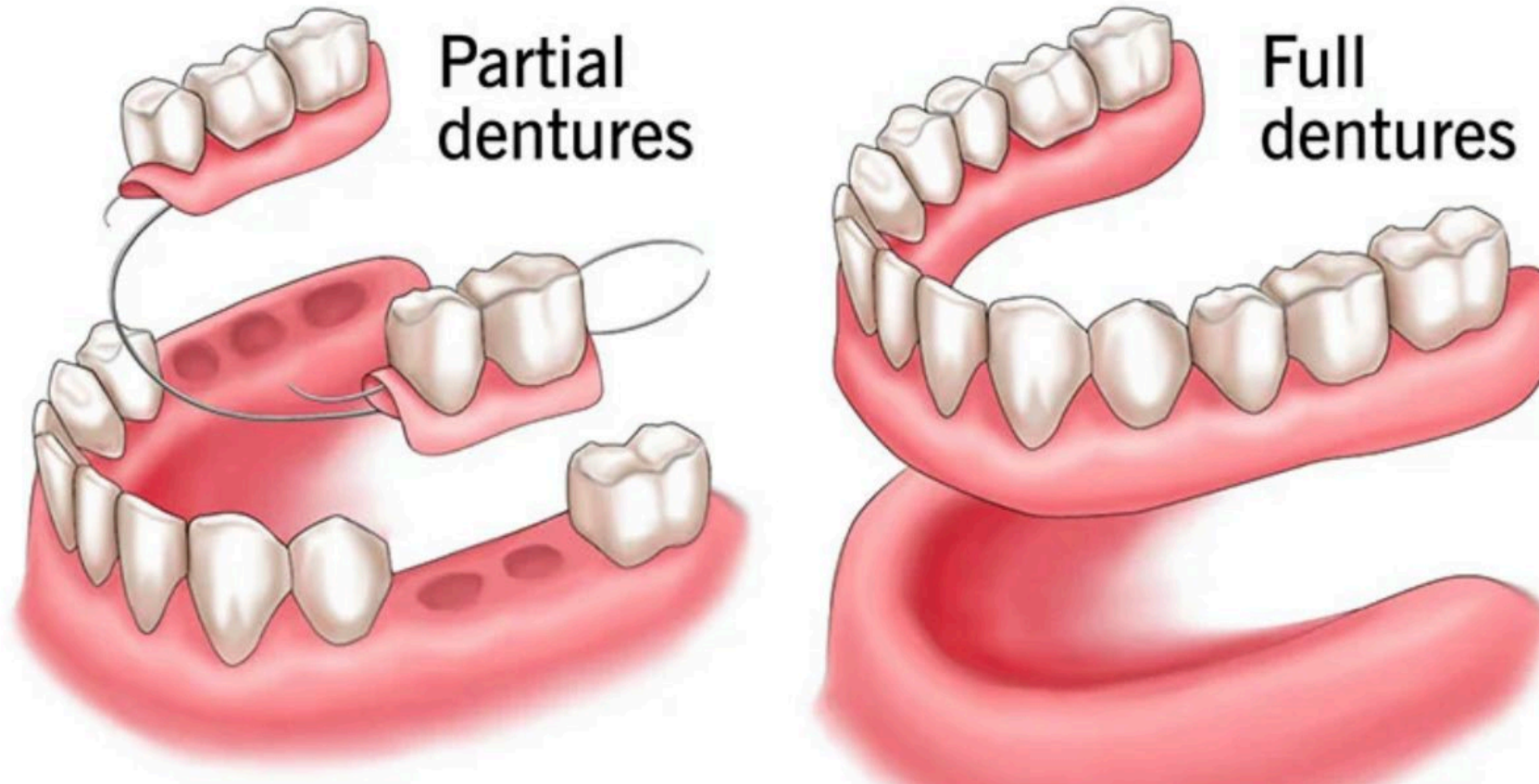
Treatment and Restoration of Dental Caries, cont.

5. **Fixed Bridge:** A fixed bridge can be used to replace teeth that have been lost due to decay. The bridge uses teeth that are adjacent to the missing space as anchors. The adjacent teeth are prepared for crowns and a fake tooth sits in between crowned teeth.



Treatment and Restoration of Dental Caries, cont.

6. **A Partial Denture or Complete Denture:** A denture is a removable device that replaces missing teeth. A complete denture will replace an entire arch, whereas a partial denture will replace a segment of the arch relying on existing teeth to provide retention



Treatment and Restoration of Dental Caries, cont.

Dentures continued.....



Treatment and Restoration of Dental Caries, cont.

Dentures continued.....



Questions??

Thank You!
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