INTRODUCTION TO DENTISTRY DSA 102

AN INTRODUCTION TO PEDIATRIC DENTISTRY

II

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Salman Bin Abdul Aziz University
Sunday 14/12/2014
2:00 pm-3:00 PM

INTRODUCTION TO PEDIATRIC DENTISTRY

Lecture Outline

- Definitions of Pediatric Dentistry
- Aims and Objectives of pediatric dental practice
- Scope of pediatric dentistry
- Specific differences between child and adult patients
- General principles of pediatric pharmacology
- Responsibilities of the pediatric dentist

DEFINITIONS OF PEDIATRIC DENTISTRY

Pediatric Dentist

Pediatric Dentistry:

www.words4ever.com

AIMS AND OBJECTIVES OF PEDIATRIC DENTAL PRACTICE

- Services focused from the what is best oh the child
- The child should be treated as a whole
- Prevention of oral diseases must be the prime motive
- Educating parents regarding importance of deciduous teeth, dental treatment and preservation of teeth
- Observe developing dentition and jaws regularly
- Relief of pain and sepsis
- To achieve and maintain esthetics
- Improving personal information data bank through updating of both clinical and theoretical knowledge on a regular basis

SCOPE OF PEDIATRIC DENTISTRY

Age-defined:

Primary and comprehensive care :

Infants and children through adolescence:

Special health care needs:

SPECIFIC DIFFERENCES BETWEEN CHILD AND ADULT PATIENTS

Child is an a dynamic state of growth and development and is thus a changing person.

Three general areas pediatric patients are unique compared to the adult:

1. Physiologic and anatomic differences
2. Pharmacokinetics
3. Emotional differences

GENERAL PRINCIPLES OF PEDIATRIC PHARMACOLOGY

1. Metric system used to determine dosage
2. Younger the patient, more atypical therapeutic and toxicological response to drug therapy
3. In older patients the depth of anesthesia is more profound compared to the younger
4. Prolonged therapy with agents the affect endocrine system retards the growth (Large doses of corticosteroids retard growth
5. Excessive use of syrup and elixirs containing sugar, damage teeth
6. Allergenicity is greater during childhood in the less than 15 years of age
7. Tetracyclines not used in children less than 8 years old
8. Dosage rules should be followed

DOSAGE RULES FOR CHILDREN

1. Clarke's formula:

Body wt (kg) X Adult dose/150

2. Young's formula:

Age X Adult dose/Age+12

SPECIFIC DIFFERENCES BETWEEN CHILD AND ADULT PATIENTS

1. Treatment relationship is one to two relationship (recently society added)
2. Children exhibit a fear of unknown
3. Do not know to rationalize
4. Behavior management modalities differ, depending on age and understanding
5. Children have less concentration time
6. Treatment appointments preferably during morning time
7. Seeks treatment usually by the will of his parents

Introduction To Pediatric Dentistry

Overview

The pediatric dental patient presents to the dentist a variety of clinical encounters not seen in adults. Recognition and management of these conditions may require that the dentist provide actual treatment to the patient or just reassurance to the parent. This course will discus a variety of dento/orofacial conditions commonly found in pediatric patients and their management from infancy to adolescence. The topics covered in this lecture are:

- Primary Teeth
- Permanent teeth
- Common Dental problems

Introduction To Pediatric Dentistry

FDI World Dental Federation Two-Digit Notation (international)

- This system, developed by the Fédération Dentaire Internationale (FDI), World Dental Federation notation is also known as ISO-3950 notation.
- The human teeth are symmetrically arranged in the mouth. Each quadrant of the mouth has 8 different teeth that are mirrored horizontally and vertically to the other quadrants.
- In the FDI (Fédération Dentaire Internationale) World Dental Federation notation each one of these 8 teeth is assigned a number from 1 to 8, starting from the center front tooth (central incisor) and moving backwards up to the third molar (number 8)
- Each quadrant is also assigned a number, from 1 to 4 for the adult (permanent) teeth or 5 to 8 for the baby (primary or deciduous) teeth.

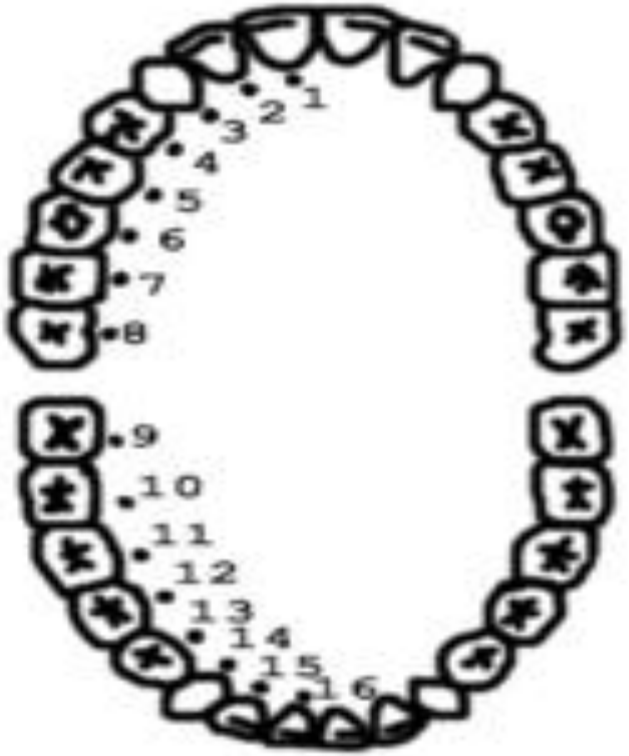
Adult Teeth

Upper Teeth

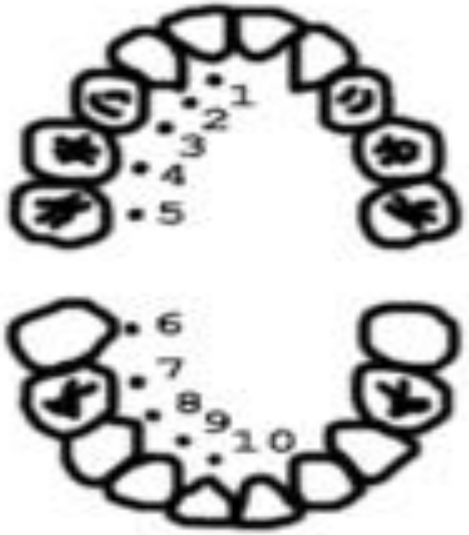
1.Central Incisor
2.Lateral Incisor
3.Canine (cuspid)
4.First Premolar (first bicuspid)
5.Second Premolar (second bicuspid)
6.First Molar
7.Second Molar
8.Third Molar (wisdom tooth)

Lower Teeth

9.Third Molar (wisdom tooth)
10.Second Molar
11.First Molar
12.Second Premolar (second bicuspid)
13.First Premolar (first bicuspid)
14.Canine (cuspid)
15.Lateral Incisor
16.Central Incisor



Baby Teeth



Upper Teeth

1.Central Incisor
2.Lateral Incisor
3.Canine (cuspid)
4.First Molar
5.Second Molar

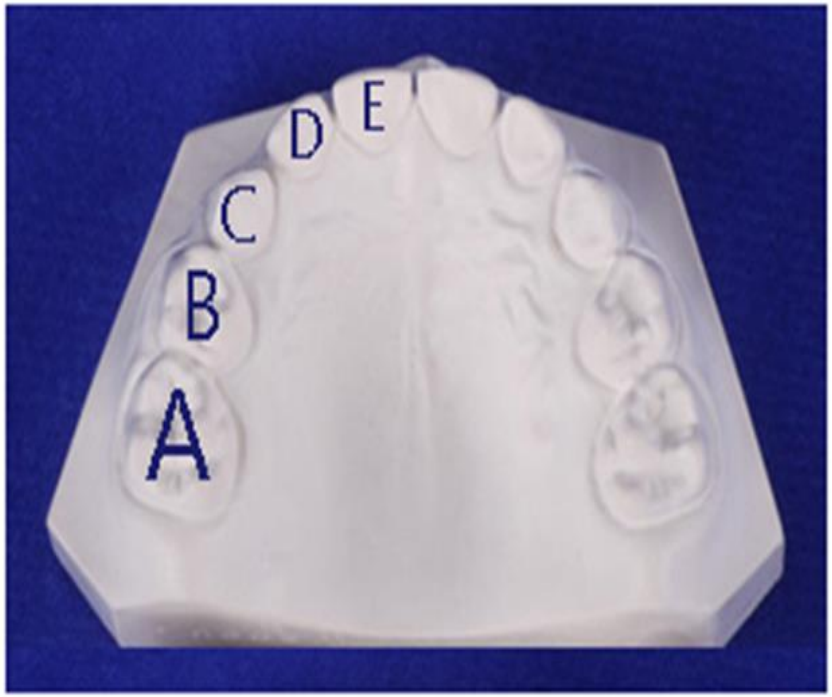
Lower Teeth

6.Second Molar
7.First Molar
8.Canine (cuspid)
9.Lateral Incisor
10.Central Incisor

Introduction To Pediatric Dentistry

Primary Teeth

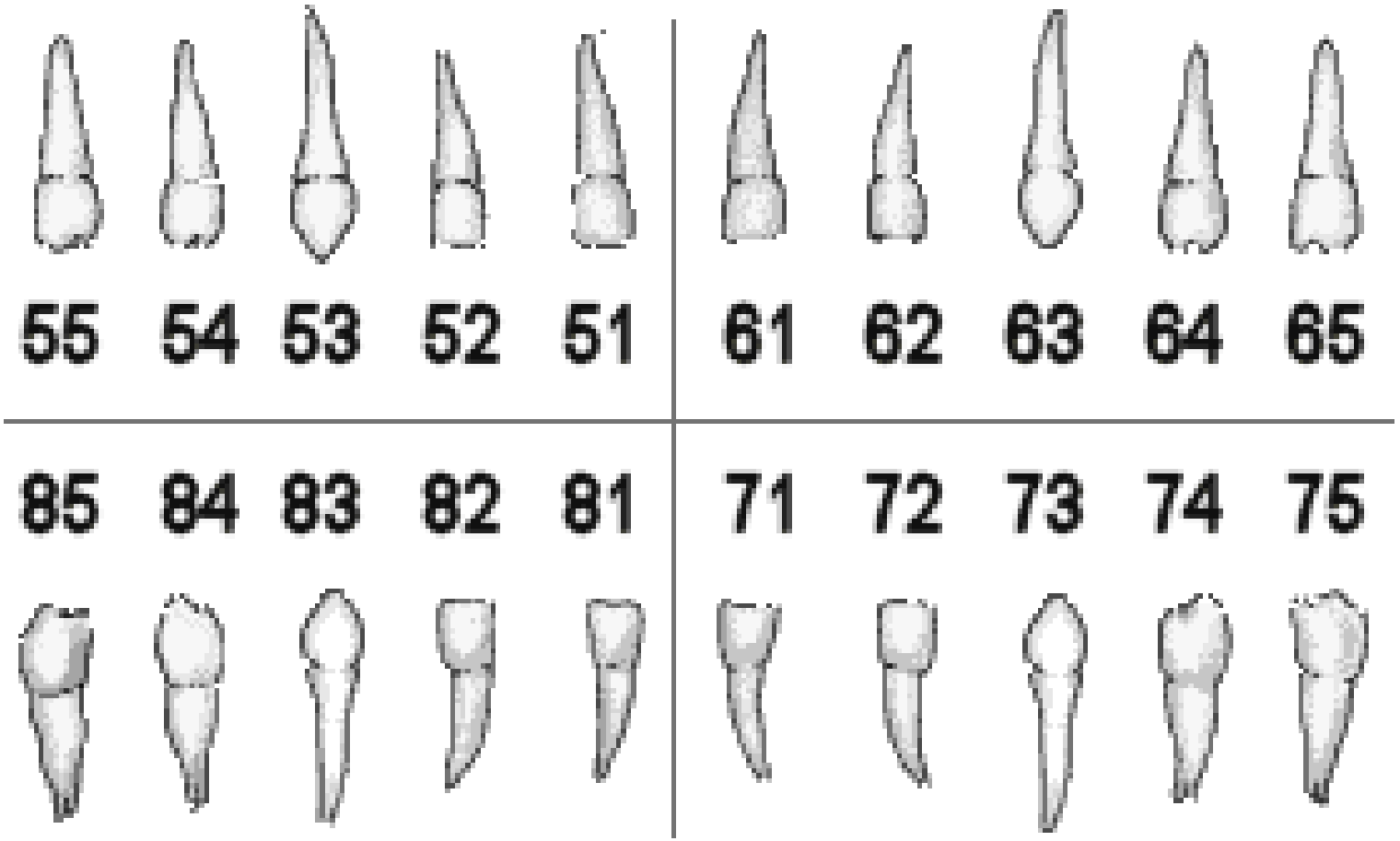
Primary Dentition
E - Maxillary Right Primary Central Incisor
D - Maxillary Right Primary Lateral Incisor
C - Maxillary Right Primary Canine
B - Maxillary Right Primary 1st Molar
A - Maxillary Right Primary 2nd Molar



FDI two-digit tooth numbering system

Teeth numbering chart for primary teeth

upper right	upper left



lower right	lower left

Introduction To Pediatric Dentistry

Primary Teeth

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Primary Teeth

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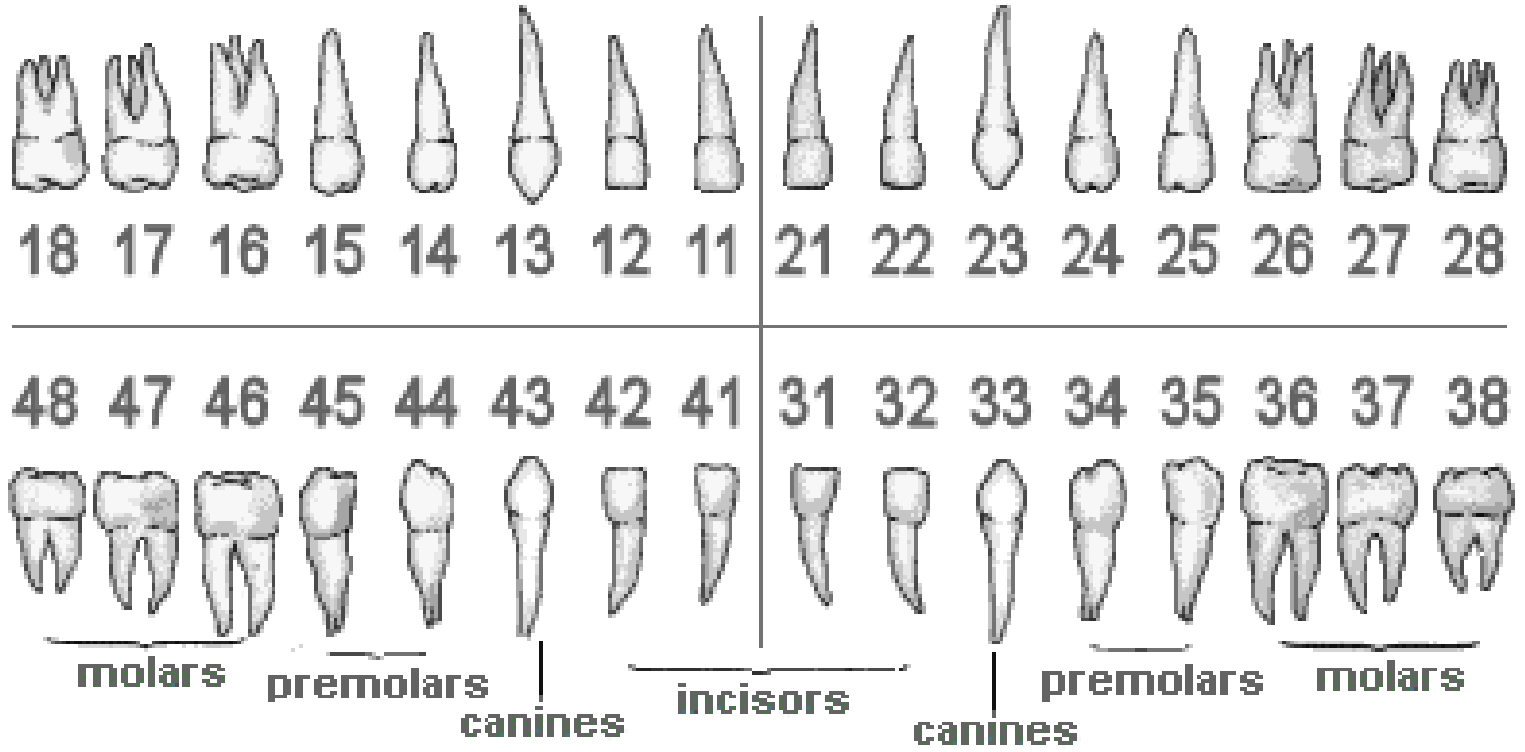
Permanent Teeth

Permanent Dentition
8 - Maxillary Right Central Incisor
7 - Maxillary Right Lateral Incisor
6 - Maxillary Right Canine
5 - Maxillary Right 1st Premolar
4 - Maxillary Right 2nd Premolar
3 - Maxillary Right 1st Molar
2 - Maxillary Right 2nd Molar
1 - Maxillary Right 3rd Molar

FDI two-digit tooth numbering system

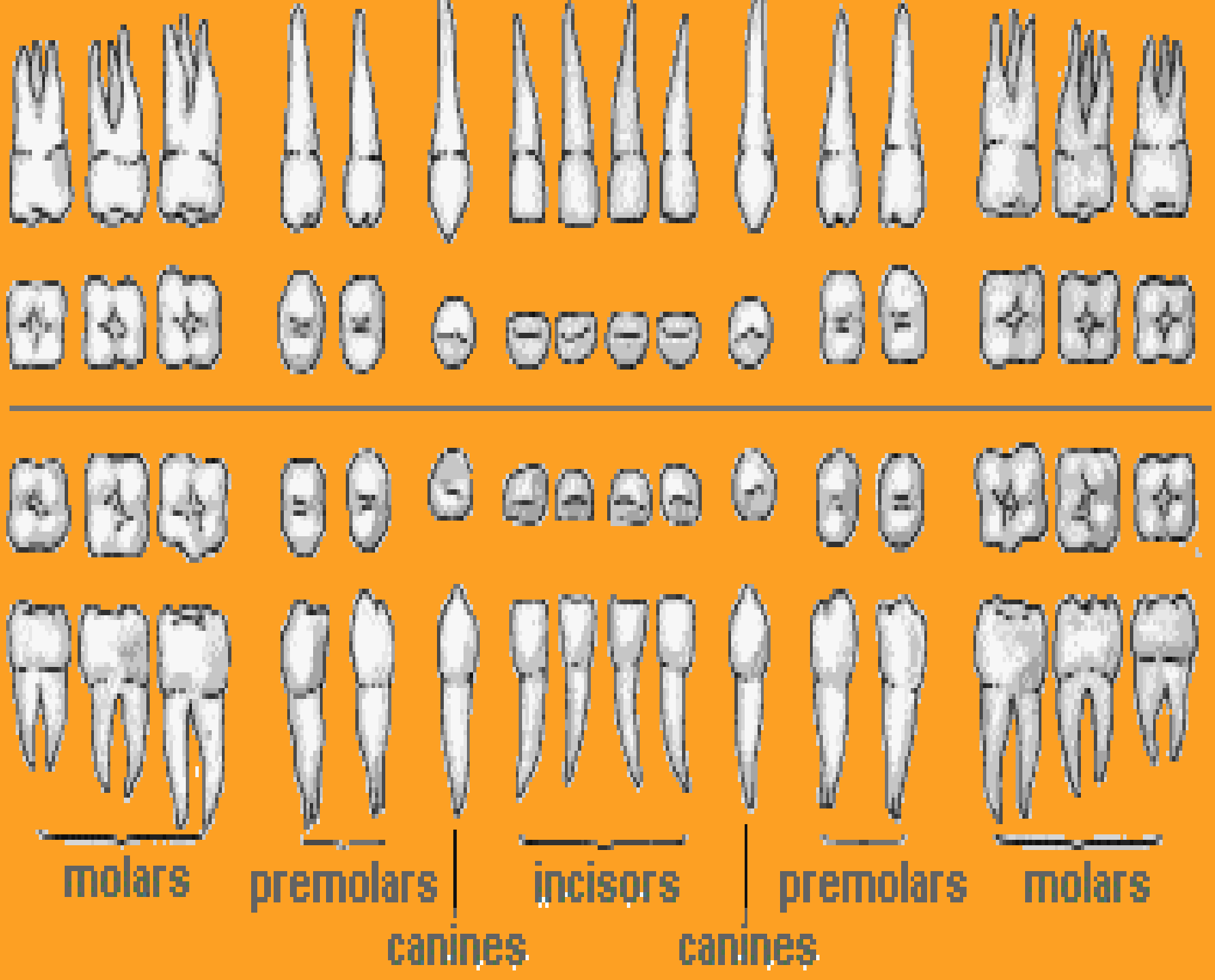
Teeth numbering chart for adult teeth

upper right	upper left



lower right	lower left

Orientation of the *FDI two-digit tooth numbering* chart is traditionally "**dentist's view**", i.e. patient's right corresponds to tooth chart's left side. The designations "left" and "right" on the chart, however, correspond to the patient's left and right, respectively.


molars
premolars
canines
incisors
canines
premolars
molars

Introduction To Pediatric Dentistry

Permanent Teeth

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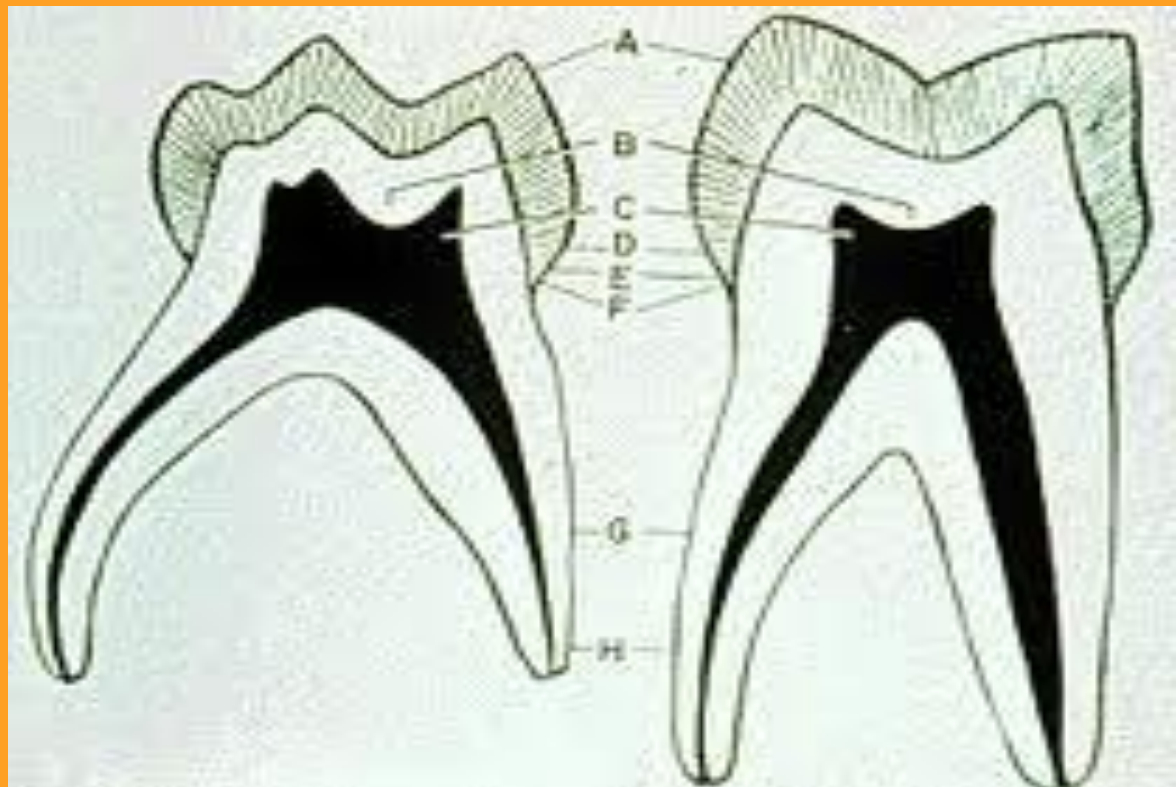
Permanent Teeth

Introduction To Pediatric Dentistry

Differences Between A Deciduous Tooth and A Permanent Tooth

- Features of a Deciduous Crown
- Features of a Deciduous Pulp
- Features of a Deciduous Root



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Differences Between A Deciduous Tooth and A Permanent Tooth

- Features of a Deciduous Crown

1. Shorter crown
2. Narrower occlusal table
3. Constricted cervical portion
4. Thinner enamel and dentin
5. Enamel rods in the gingival third extend occlusally from the DE junction
6. Broad and flat contact areas
7. Lighter color

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Differences Between A Deciduous Tooth and A Permanent Tooth

- Features of a Deciduous Pulp

1. Larger pulp in relation to the crown size
2. Pulpal horns closer to the outer surface of the tooth
3. Larger pulp chamber in the mandibular molar than does the maxillary
4. Pulp chamber form follows the surface of the crown
5. Usually there is a pulp horn under each cusp
6. Thin and slender roots pulp, thin pulp canals
7. Accessory canal extend from the floor of the pulp chamber to the furcation area
8. Increased blood supply
9. Increased internal resorption
10. Reduced sensitivity to pain due to less number of nerve fibers
11. Multiple ramification
12. Ribbon shaped root canal that narrower mesiodistally
13. Increased reparative dentin formation

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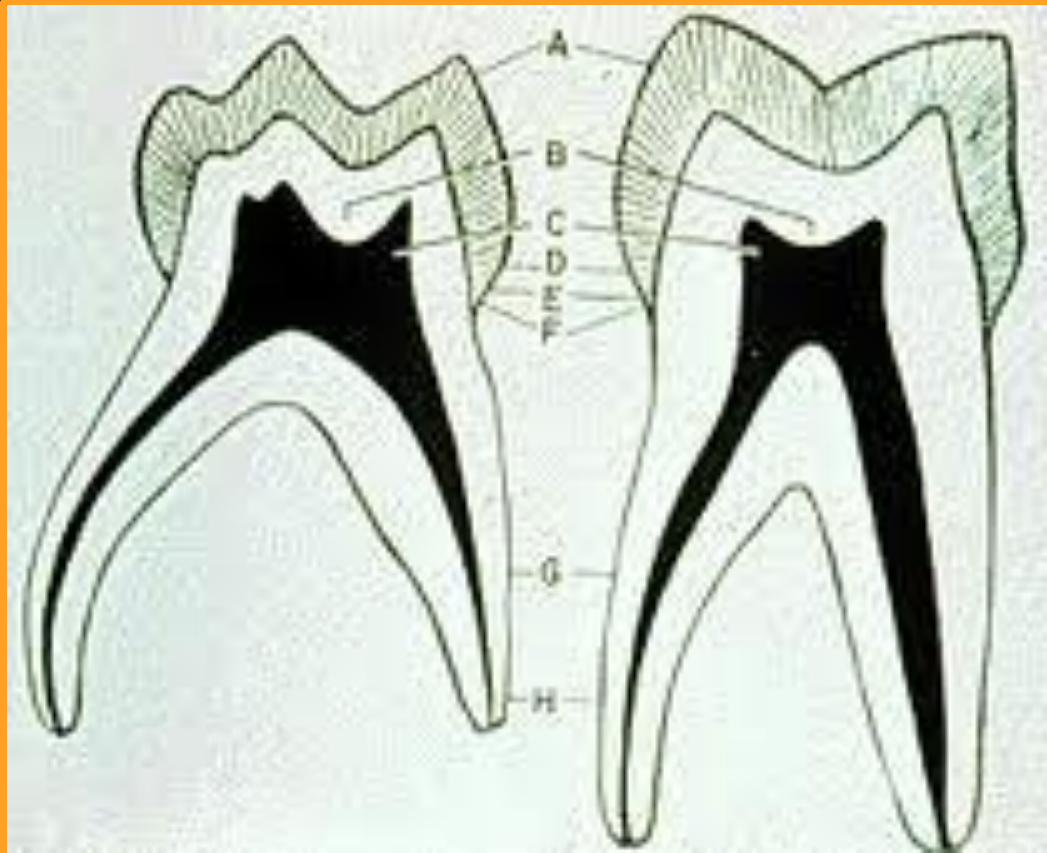
Differences Between A Deciduous Tooth and A Permanent Tooth

- Features of a Deciduous Root

1. Narrower root mesiodistally in the anterior teeth
2. Longer and more slender in relation to crown of the posterior teeth
3. Flare more as they approach the apex



Introduction To Pediatric Dentistry

Common Dental problems

The pediatric dental patient presents to the dentist a variety of clinical encounters not seen in adults. Recognition and management of these conditions may require that the dentist provide actual treatment to the patient or just reassurance to the parent. This course will discus a variety of dento/orofacial conditions commonly found in pediatric patients and their management from infancy to adolescence. The topics covered in this course are:

- Soft tissue pathology
- Hard tissue pathology
- Dental developmental problems
- Teething
- Nursing caries
- Habits
- Eruption problems
- Space maintenance

Introduction To Pediatric Dentistry

Soft Tissue Pathology

- Epstein Pearls
- Bohn's Nodules
- Dental Lamina Cysts
- Riga-Fede Aphthae/Granuloma
- Eruption Cysts
- Geographic Tongue
- Postoperative Soft Tissue Injury

Introduction To Pediatric Dentistry

Soft Tissue Pathology

Epstein Pearls

are small white lesions that form along the midpalatine raphe. They are thought to be remnants of epithelial tissue that trapped along the raphe as fetus grew.

Treatment

No treatment is Necessary as the lesions spontaneously shed within weeks of birth.

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Soft Tissue Pathology

Bohn's Nodules

are formed along the buccal and lingual aspects of the dental ridge and on the palate away from the raphe. They are considered remnants of mucous gland tissue.

Treatment

No treatment is Necessary as the nodules spontaneously disappear within weeks birth.

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Soft Tissue Pathology

Dental Lamina Cysts

are found on the maxillary and mandibular dental ridges originate from remnants of the dental lamina.

Treatment

No treatment is necessary they disappear within weeks of birth.

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Soft Tissue Pathology

Riga-Fede Aphthae /Granuloma

are granulomatous ulcerations that appear on the tip and inferior surface of the tongue.

Etiology: chronic trauma to the tongue from the primary incisors during sucking or involuntary movement of the jaw.

Treatment: reducing the sharpness of the teeth by placing a protective composite shield over the incisors or extraction the teeth.

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Soft Tissue Pathology

Eruption Cysts

are associated with erupting deciduous or permanent teeth. As soft lesion well demarcated swelling overlying the crown of erupting tooth. Variations in color may exist depending on the amount of blood contained within the cyst.

Treatment : not necessary because it ruptures as the tooth erupts with the possibility of the appearance of blood on the pillow following sleep.

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Soft Tissue Pathology

Geographic Tongue

Is a harmless common disorder of the tongue characterized by atrophy or temporary loss of filiform papillae, usually multiple and asymptomatic, although burning can occur.

The lesion can last for tow weeks, disappear and reappear in another area.

Treatment: no treatment is indicated.

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Soft Tissue Pathology

Postoperative Soft Tissue Injury

Accidental biting or chewing the lip, tongue or cheek seen very young pediatric patients and mentally or physically disabled patients.

After local anaesthesia administration.

Treatment: Reassuring the patient and the parent that its normal if the tissue turns white, allowing up to a week for the injury to heal, and lubricate the area with petroleum jelly or antibiotic ointment to prevent drying cracking and pain.

Viral and Ulcerative Lesions

- Primary Herpetic Gingivostomatitis
- Recurrent Herpetic Gingivostomatitis
- Aphthous Ulcer/Stomatitis
- Angular Cheilitis
- Candidiasis

Viral and Ulcerative Lesions

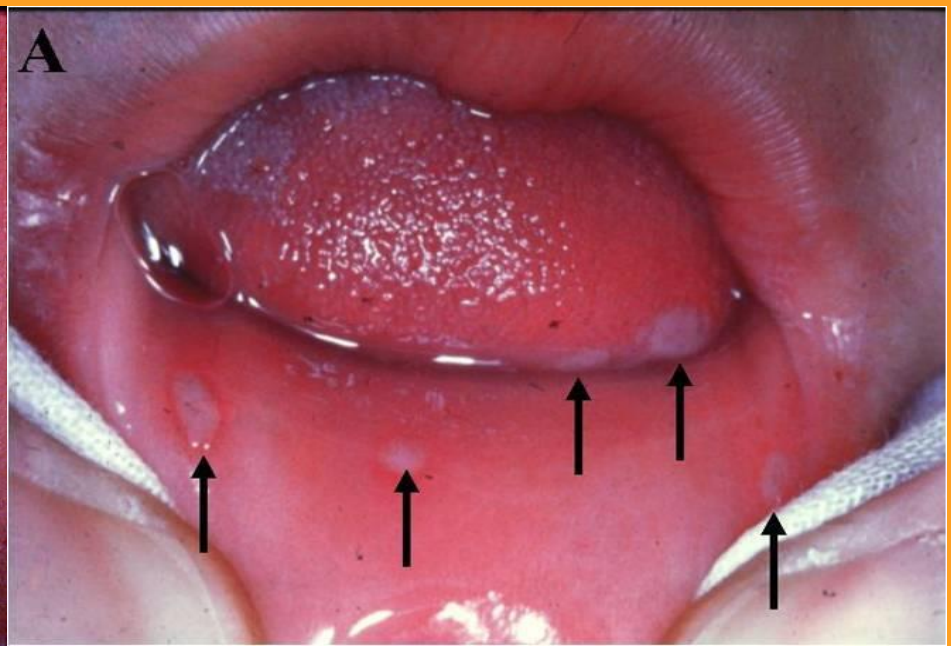
Primary Herpetic Gingivostomatitis

is the most frequent acute viral infection on the oral mucosa. Etiology: herpes simplex virus type 1 and rarely type 2

acquired through direct contact; parent or sibling kissing, sharing toys.

Primary Herpetic Gingivostomatitis

- Vesicles appear in the gingiva, tongue, palate, lips, buccal mucosa, tonsils and posterior pharynx. Perioral lesion may appear occasionally. Vesicles progress to ulcers.
- Fever, malaise and cervical lymphadenopathy.



Primary Herpetic Gingivostomatitis

- Occurrence between 6 month to 6 years but can occur later. The acute phase lasts 7-10 days with spontaneous healing in 1-2 weeks. After healing the virus remains latent in the body.
- Treatment: rinsing with a suspension of diphenhydramine (Benadryl), Kaopectate and Viscous Lidocaine for topical relief of oral lesion and rest, antipyretics, analgesics for systemic symptoms, hydration. Acidic foods should be avoided. Systemic antivirals may be considered for immunocompromised patients.

Viral and Ulcerative Lesions

Recurrent Herpetic Gingivostomatitis

is the result of herpes simple virus reactivation in previously infected individuals. Factors that may precipitate virus activation are: illness, trauma, stress, ultraviolet light and HIV. Small number of vesicles in clusters that rupture within 24 hours leaving ulcers 1-3 mm in size that heal within 6 to 10 days, on the lips, hard palate, and attached gingiva. The symptoms are milder than the primary infection. Lips lesions are covered with a brown crust.

Treatment: is symptomatic.

Viral and Ulcerative Lesions

Aphthous Ulcer/Stomatitis

are painful oral ulcers that tend to recur. Etiology: unknown, predisposing factors are trauma , genetics, stress, allergies, hormonal disturbances and AIDS. They appear after six years of age predominately in girls.

The severity ranges from minor to major.

Viral and Ulcerative Lesions

Aphthous Ulcer/Stomatitis

On mobile tissues as an ulcer covered by a white membrane surrounded by a red halo.

No fever.

Differential diagnosis herpetic gingivostomatitis.

Lasts 6-12 days

Treatment: is palliative; bland diet and application of Orabase with benzocaine or fluocinonide (Lidex gel)

Viral and Ulcerative Lesions

Angular Cheilitis

is a common disorder occurs at the corners of the lips. Its etiology is multifactorial; mechanical irritation, candidiasis, bacterial infection, habitual licking of corners of lips, deficiency anemia, and AIDS.

Treatment: topical application of antifungal and antibacterial ointment.

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Viral and Ulcerative Lesions

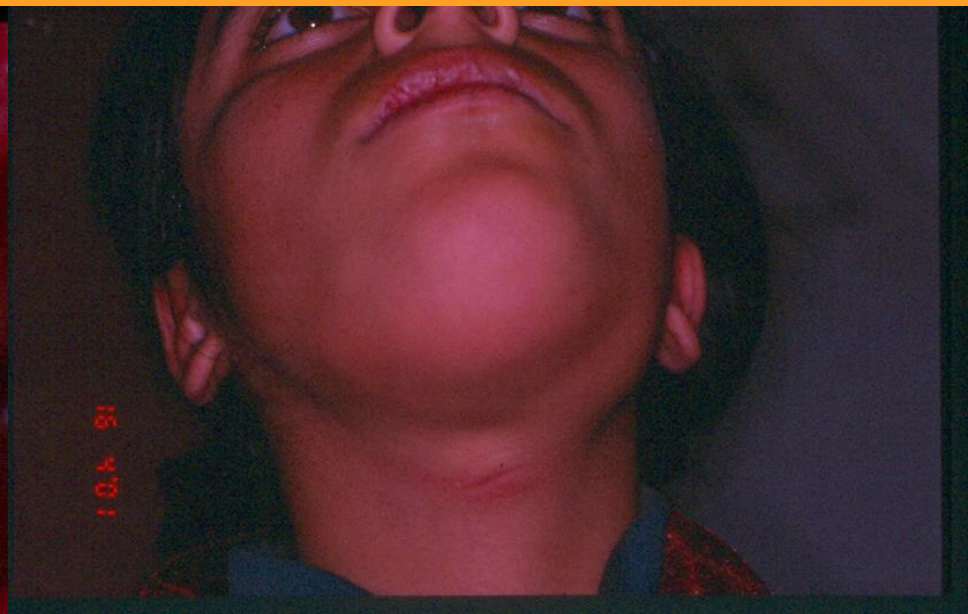
Candidiasis

is a fungal infection characterized by raised curdlike plaques that leave raw bleeding surfaces when scraped. It occurs in children who are on long-term antibiotic therapy or are immunosuppressed. It is treated with topical or systemic antifungal agents (Nystatin, clotrimazole).

Introduction To Pediatric Dentistry

Bacterial Infections

- Cellulitis
- Alveolar Abscess



Introduction To Pediatric Dentistry

Bacterial Infections

- Cellulitis is an acute and edematous inflammatory infection that spreads into the facial tissues.
- Etiology: Staphylococcus aureus, α-hemolytic streptococci, Haemophilus influenza type B and less often Gram-negative and anaerobic microorganisms. The source of infection is usually odontogenic but it can be sinus, skin or glandular in origin.
- Systemic complications include sepsis and dehydration. Maxillary cellulitis can lead to CNS involvement (meningitis, brain abscess) and cavernous sinus thrombosis. Mandibular cellulitis can lead to the spread of swelling the the submandibular, sublingual, submental spaces (Ludwig angina), fascial planes, nerves and blood vessels resulting in airway obstruction and restricted swallowing.
- Treatment: Admission to the hospital for observation, IV hydration and antibiotics if the child is febrile, dehydrated, exhibits chills or if there is suborbital or submandibular swelling. The offending tooth should be extracted when the patient can tolerate the procedure.

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Bacterial Infections

- Alveolar Abscess is an accumulation purulent material around the apex of a nonvital tooth as a result of pulpal necrosis. Clinical symptoms include a thickened periodontal membrane leading to sensitivity to percussion and movement, and swelling of the surrounding tissues. The patient may exhibit mild fever.
- Treatment: antibiotics relieve acute symptoms.

Drainage of the infection via pulpotomy or extraction provides additional pain relief. A regimen of antibiotics may be needed preoperatively to establish effective pain control. If left untreated the pus follows the path of least resistance forming an intraoral or extraoral abscess or sinus tract.

Introduction To Pediatric Dentistry

Hard tissue Pathology

- Stains:

Intrinsic Stains

Extrinsic Stains

Introduction To Pediatric Dentistry

Hard tissue Pathology

- Tooth Stains : are the result of various pigments deposits within the inner layers of the enamel, dentin and pulp (intrinsic stains) or the outer enamel surface (extrinsic stains). They may be due to systemic factors and involve selected teeth (trauma).
- Intrinsic stains: A single discolored tooth is usually a result of previous trauma to the tooth. Internal bleeding from pulpal hyperemia stains the inner layer of the dentin. The discoloration appears 3 to 4 weeks after the accident. In patients under three years the tooth may lighten spontaneously after two months.
- Treatment : no treatment is required unless pain, mobility, infection is present or if the patient or parent has aesthetic concerns. Endo treatment for permanent teeth only. If radiographic examination of a discolored primary tooth reveals root resorption, endodontic therapy is contraindicated and extraction is recommended.

Introduction To Pediatric Dentistry

Hard tissue Pathology

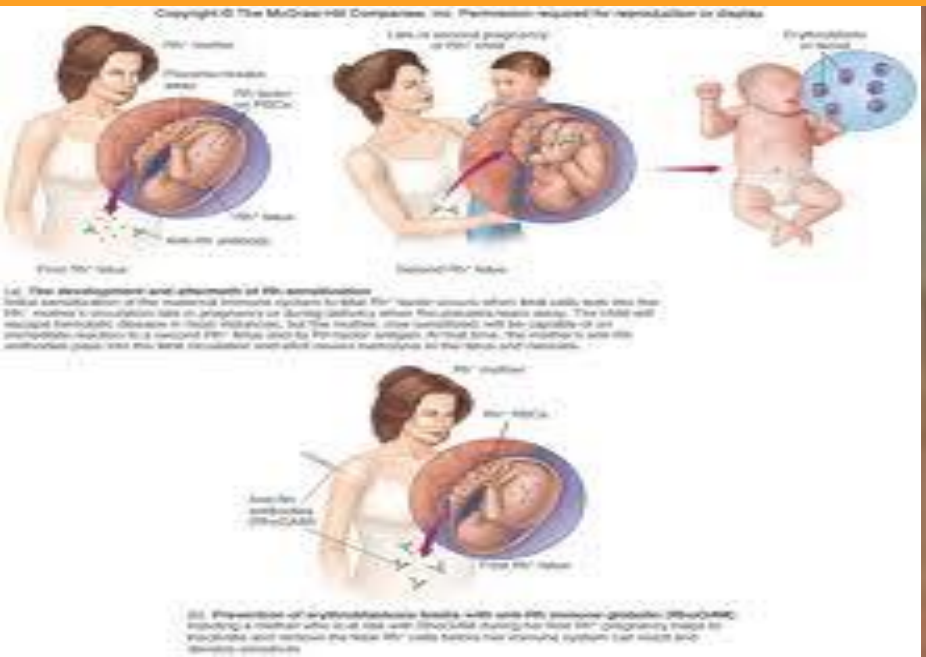
Tooth Stains

- **Intrinsic stains**
- Erythroblastosis fetalis
- Cystic fibrosis
- Dentinogenesis imperfecta
- fluorosis

Introduction To Pediatric Dentistry

Tooth Stains

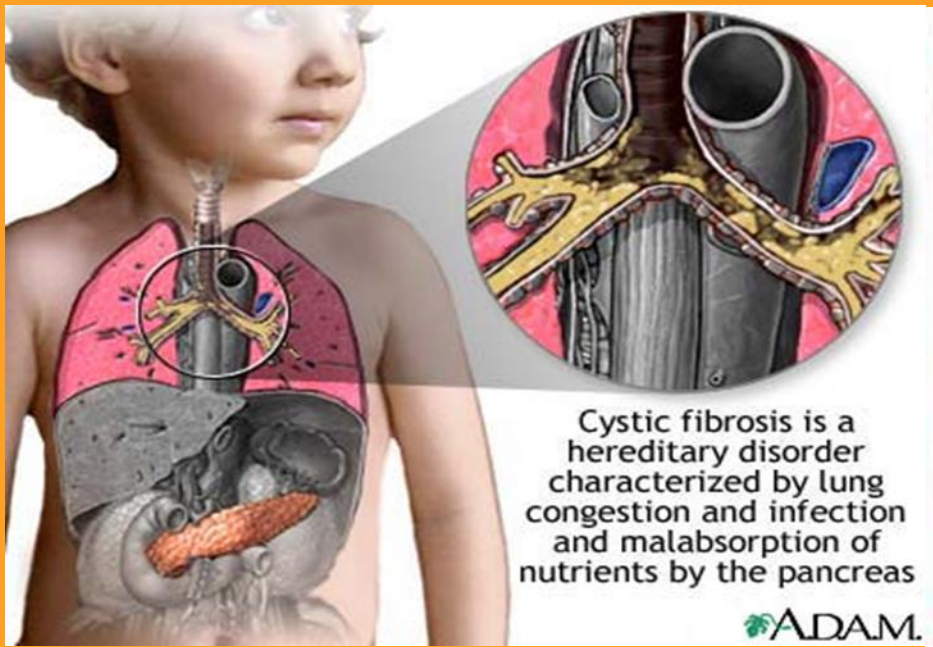
- **Intrinsic stains**
- Erythroblastosis fetalis: bilirubin is incorporated into the developing dentition resulting in a yellow-green and blue-green discoloration of the teeth.



Tooth Stains

Intrinsic stains

Cystic fibrosis: the disease alone or medication (tetracycline) results in dark teeth ranging from yellowish-gray to dark brown discoloration.



Tooth Stains

Intrinsic stains

Dentinogenesis imperfecta: a genetic abnormality of dentin collagen during the histo-differentiation phase results in brownish, semitransparent opalescent teeth.

Tooth Stains

Intrinsic stains

- Fluorosis: due to defective mineralization of the enamel organic matrix from high levels of ingested fluoride resulting in chalky and opaque white or gray stain and patches.



Intrinsic Stains

Treatment

1. Bleaching vital and non-vital technique
2. Aesthetic restorations
3. Microabrasion

Introduction To Pediatric Dentistry

Hard tissue Pathology

- Stains
- Intrinsic Stains
- Extrinsic Stains

Introduction To Pediatric Dentistry

Hard tissue Pathology

Tooth Stains

Extrinsic Stains: may involve all or some of the teeth and result from an excess of various chemicals or minerals in the saliva. Stain location is around the mandibular incisors in the vicinity of the sublingual glands and the maxillary molars in the vicinity of the parotid glands.

Introduction To Pediatric Dentistry

Hard tissue Pathology

Tooth Stains

Extrinsic Stains:

- Iron, magnesium, silver-black pigmentation
- Mercury-gray or green pigmentation
- Lead-gray pigmentation
- Copper- brown or green pigmentation
- Nickel- green pigmentation
- Cadmium – yellow pigmentation
- Potassium- violet pigmentation
- Chromogenic bacteria- green and orange stain accumulating on the gingival third of the labial surfaces of teeth usually due to poor oral hygiene. Chromogenic stains is easier to remove than chemical or mineral stains.

Introduction To Pediatric Dentistry

Hard tissue Pathology

Enamel Defects: are due to etiological factors occurring during the apposition and mineralization stages of dental development, these factors may be local, systemic and genetic factors. As

- Enamel hypoplasia
- Hypocalcification
- hypomaturation

Enamel Defects

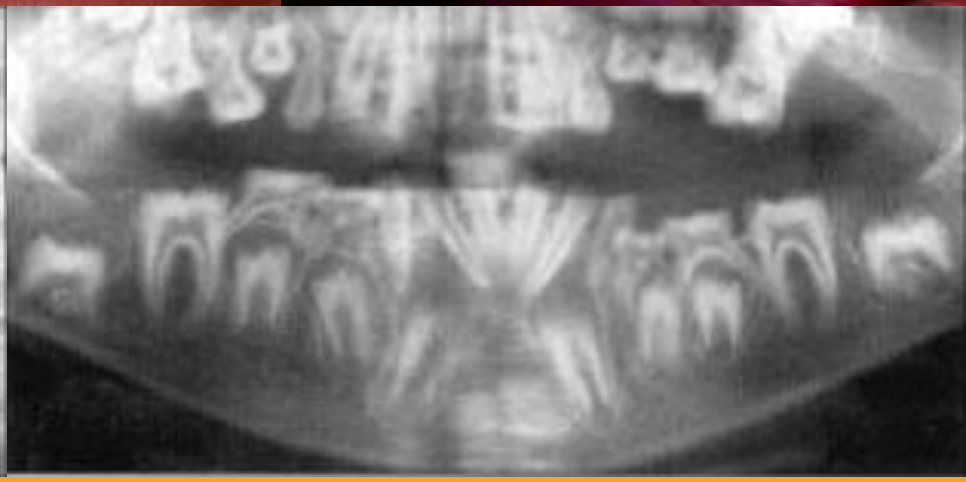
Local etiology: a single tooth is involved such as a traumatic intrusion of a primary tooth into a permanent tooth.

Enamel Defects

Systemic etiology: involve multiple teeth developing during the time of action of the etiological factor (medications, fever, malnutrition, illnesses, etc.) such as a traumatic intrusion of a primary tooth into a permanent tooth. Etiological factors occurring during pregnancy affect the primary teeth. Etiological factors occurring after birth will affect permanent teeth. Usually defects of genetic etiology affect all the primary and permanent teeth.

Enamel Defects



Introduction To Pediatric Dentistry

Developmental Properties

- Gemination
- fusion
- Supernumerary Teeth
- Dens Evaginatus
- Dens Invaginatus
- Microdontia

Developmental Properties

Gemination (twinning): is the incomplete division of the tooth bud resulting in the formation of two partially or completely independent crowns. The pulp chamber s and root may be combined or separate. Geminated teeth give the appearance of an extra tooth and result in potential crowding. The area of defect may vary from a minor notch in the incisal edge of the crown to tow separate crowns. The area of the defect may be a focal point for caries formation and should be treated with sealants and composites.

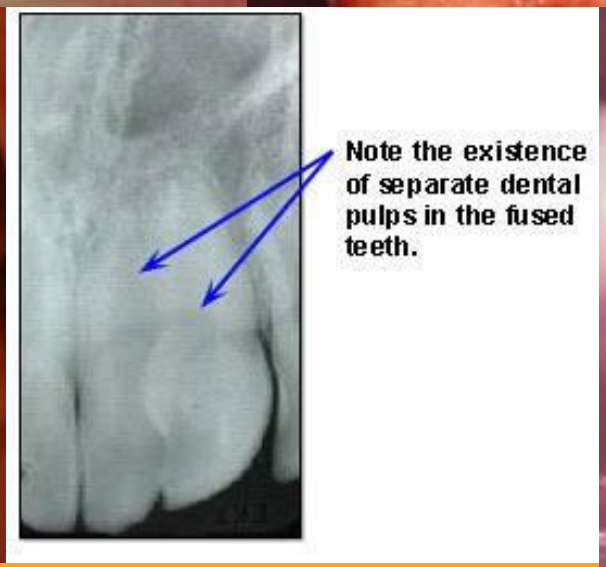
GEMINATION (TWINING)

Developmental Properties

Fusion: is the union of tow discrete tooth buds to form a tooth with an anomalous shape. It is seen in the anterior region. Fusion of two teeth leads to a reduced number of teeth. Local factors during tooth bud development result in interdental lamina persistence. Genetic factors have also been implicated. If fusion occurs early in development the defect affects the total length of the tooth resulting in a single normal size tooth. If fusion occurs later in development the defect only affects the root resulting in shared dentin and cementum and one large tooth with bifid crown. Fusion only along the line of cementum is referred to as concrescence. The simplest way to distinguish between germination and fusion is to count teeth. Gemination results in an extra tooth. Fusion results in a reduced number of teeth.

FUSION


SCIENCEphotoLIBRARY


Note the existence of separate dental pulps in the fused teeth.

Developmental Properties

Supernumerary Teeth: the presence of extra teeth in the dental arch. It is due to abnormal activity of the dental lamina leading to the formation of extra tooth buds. There greater frequency of occurrence in the maxillary arch(9:1) and in males (2:1). 75% remain in bone and are only diagnosed radiographically. They are found in the midline (mesiodence), beyond the 3rd molar (distomolar) or in the molar area (paramolar). Treatment is extraction and orthodontics.

SUPERNUMERARY TEETH






Hyodontia

Developmental Properties

Dens Evaginatus (Talon cusp)

is an elevated conical defect seen on the lingual or occlusal surface of the affected tooth. It is a genetic defect and rarely seen in primary teeth. Evaginations consist of enamel, dentin and pulp. There is an increase risk of pulp exposure due to trauma by the mandibular incisors occluding into the evagination. There is an increased risk of caries in the area between the lingual surface of the crown and the evagination.

Treatment consists of gradual reduction of the evagination to induce formation of secondary dentin. The technique involves carefully removing enamel without local anesthesia until the patient complains of sensation. Fluoride varnish is applied and the patient returns in 3 months for further reduction. Preventive application of sealant of flowable composite in non-hygienic areas is recommended.

Dens Evaginatus (Talon cusp)

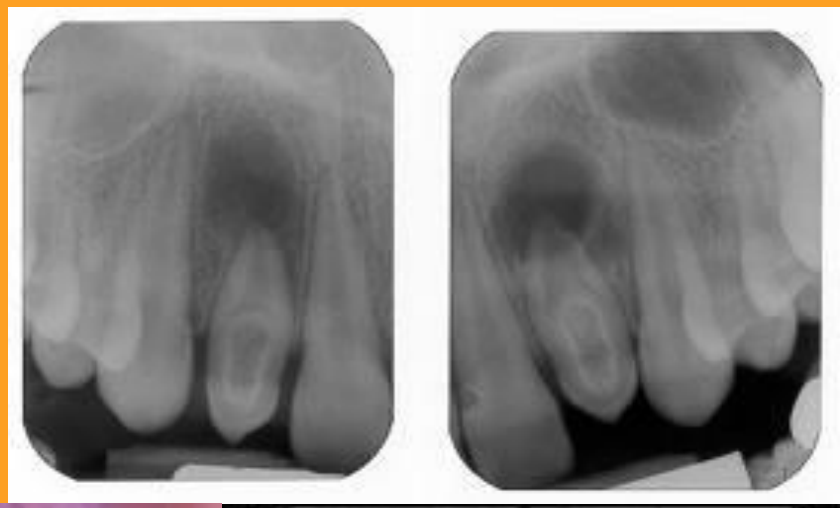
Dens Invaginatus (Dens in Dente)

is a defect characterized by a prominent lingual cusp and centrally located fossa. The defect results from early invagination of enamel epithelium into the dental papilla of the underlying tooth germ. Its occurrence is more common in permanent teeth. There is increased risk of caries forming in the lingual pit of the tooth that can result in pulp infection and necrosis. Treatment involves preventive filling of the pit and endodontic treatment if indicated.

Dens Invaginatus (Dens in Dente)

Dens in dente (dens invaginatus)–This is a developmental anomaly that results when the enamel organ invaginates into the crown of a tooth prior to mineralization. This clinical view shows a maxillary left lateral incisor with dens in dente. The maxillary lateral tooth is most frequently affected.

(Courtesy of Dr. George Blocks.)



Microdontia

refers to a clinical condition where a tooth appears smaller in size in comparison to other teeth in a normal size jaw. It is rare in primary teeth. It is more common in permanent teeth and in females. The most common locations are the maxillary lateral incisors and third molars. The shape of the tooth may be conical (peg) or normal. General microdontia may be associated with congenital hypopituitarism, and radiation or chemotherapy exposure. Localized microdontia is frequently associated with hypodontia (missing teeth) and is not unusual to see a microdontic maxillary lateral incisor and a missing contralateral tooth. These defects may be controlled by different mutations of the same gene. The tooth is treated aesthetically with composites, crowns, and orthodontics for closure of spaces.

MICRODONTIA

Introduction To Pediatric Dentistry

Early Childhood Issues

- Teething
- Early Childhood Caries

Teething

is a natural process that usually occurs at about 6 months of age. However, some infants exhibits signs of systemic distress such as crying, increased drooling, high fever, diarrhea, facial rash, sleep difficulty and mild pain. There is a tendency for the child to bite or chew. One theory as to the etiology of the symptoms is the timing coincides with the loss maternal antibodies and the symptoms ae reflective of a systemic infection. Treatment is palliative; increased fluids consumption, non-aspirin analgesics, teething rings to apply cold and pressure to the gums. Children with high fevers should be evaluated by their pediatricians.

TEETHING

Early Childhood Caries

(Nursing Caries, Baby Bottle Caries): is due to consumption of fermentable carbohydrate liquids (juices, sodas, infant formula, cow and mothers milk) during excessive bottle feedings and/or prolonged breast feedings. It affects 1-12% of the pediatric population in development countries and up to 70% in underdevelopment countries.

The effects of ECC are demonstrated by initial caries involvement of the maxillary anterior teeth, the maxillary and the mandibular first primary molars, and the mandibular canines. Depending on severity the mandibular incisors are unaffected. As early as twelve months, demineralized enamel takes on a chalky white appearance, as caries progresses into dentin, brown lesions form gingivally. Untreated lesions progress into the pulp and eventually abscess.

Early Childhood Caries

(Nursing Caries, Baby Bottle Caries)

The distinctive pattern of ECC is due to an interaction of factors.

- the child ingests liquids containing fermentable carbohydrates at sleep time.
- The liquid pools around the maxillary incisors, maxillary and mandibular molars and mandibular cuspids due to a reduction in salivary flow and swallow reflex. The anterior position of the tongue under the nipple of the bottle or breast protects the mandibular incisors.

Early Childhood Caries

Early Childhood Caries

Early Childhood Caries

Early Childhood Caries

(Nursing Caries, Baby Bottle Caries)

Treatment includes:

- Ideally the child is weaned off the bottle by twelve months and is encouraged to drink from a cup. The AAPD recommends weaning by 12 months. The AAP recommends weaning by 18 months and introduction of a cup at 12 months.
- If that is not possible, water should be substituted for the fermentable liquid. The authors technique was to recommend to the parents to dilute the fermentable liquid with water by 25%. This level was maintained for two nights. The fermentable liquid was diluted by another 25% for two more nights. Subsequent dilutions were continued until the bottle contained 100% water.
- Treat white spot lesions with fluoride varnish.
- Restore or extract the carious teeth.
- Early extraction of the maxillary incisors (prior to speech development) may lead to speech problems. It I can also cause a self image problem in the child (and to an extent, the parent). Replacement of extracted teeth with a prosthesis may be recommended for proper speech development and aesthetic and if the child is able to tolerate the appliance.

Introduction To Pediatric Dentistry

Oral Habits

- Thumb and Finger Habits
- Common Intraoral Appliances
- Pacifiers
- Lip Habits
- Bruxism

Oral Habits

- Thumb and Finger Habits: make up the majorities of oral habits. However tow thirds of children who engage in thumb and finger habits outgrow them by age five. The dentofacial changes will vary with the intensity, duration, and frequency of the habit and the position of the digit in the mouth.
- The dentofacial changes includes: Anterior open bite, Facial movement of the maxillary incisors, Lingual movement of the mandibular incisors, Maxillary constriction

Oral Habits

Oral Habits

Oral Habits

Thumb and Finger Habits

The earlier the habit is discontinued the greater the likelihood of the dentofacial self correcting. However , the child should be allowed to stop the habit spontaneously. Most habits stop in school due to peer pressure so definitive treatment is not initiated until ages 4-6 years. If the child or the parent does not want to discontinue the habit do not force the issue. The type of treatment prescribed is dependent on the child's willingness of the child to stop the habit.

The simplest treatment is counseling the patient. The success of this approach is dependent on the child's ability to understand the consequences of continuing the habit. A second approach is reminder therapy. This is effective in a child who wants to stop the habit but needs additional help. The technique involves placing a cue on the patients finger as a reminder not to place their finger in the mouth, especially while sleeping. The cues may be a bandage, a sock or mitten, a bitter substance or a commercially bought appliance. It is important to emphasize to the child that the treatment mechanism is not a punishment but just a reminder.

Oral Habits

Thumb and Finger Habits

A second approach is reminder therapy. This is effective in a child who wants to stop the habit but needs additional help. The technique involves placing a cue on the patients finger as a reminder not to place their finger in the mouth, especially while sleeping. The cues may be a bandage, a sock or mitten, a bitter substance or a commercially bought appliance. It is important to emphasize to the child that the treatment mechanism is not a punishment but just a reminder. The reminder therapy can be used in conjunction with a reward system. A contract is drawn up with the child and parent. The contract states that the child will discontinued the habit in a specified amount of time and if successful will receive a reward (the type agreed upon by the parent and child). Placing stickers or marks on a calendar monitors the child's progress. If the habit persists after the reminder therapy and the child truly wants to discontinue the habit then intraoral appliance therapy should be considered. The intention of placement of intraoral appliance is to discourage the habit by making it difficult to suck the thumb or finger.

Oral Habits

Thumb and Finger Habits

Common intraoral appliances

- Quadhelix appliance
- Kentucky Bluegrasss appliance
- Palatal Crib

Oral Habits

Thumb and Finger Habits

Common intraoral appliances

- Quadhelix appliance

Dual function acts a reminder to the child not to place the thumb or finger in the mouth and simultaneously expands the constricted arch, if present.

Oral Habits

Thumb and Finger Habits

Common intraoral appliances

- Kentucky Bluegrasss appliance
- Discourages the digital habits by reducing sucking satisfaction. The acrylic cylinder spins as pressure is exerted by the thumb or finger interfering with placement of the digit. It does not expand constricted arches.

Oral Habits

Thumb and Finger Habits

Common intraoral appliances

- Palatal Crib mechanically interferes with thumb and finger placement. It does not expand a constricted arch. It should be emphasized to the child that these appliances are not punishment but are aids in discouraging the unwanted habit.

Oral Habits

- Pacifiers : the consequences of extensive use a pacifier are similar to that of finger and thumb sucking but not as pronounced. The pacifier habit tends to end earlier than digital habits because they are easier to lose intentionally or non-intentionally . 90% are ended before 5 years of age and 100% by age 8. the earlier the pacifier is removed the greater the chance of the dentofacial changes self correcting.

Oral Habits

- Lip Habits : lip licking is the most common lip habit. The most common clinical effects are inflamed chap lips exhibiting an erythematous wide border encircling the lips with normal skin area just around the vermillion border. There is little that can be done to stop the habit, however, the irritated areas can be controlled with the application of steroids, antibacterial and antifungal ointments.

Introduction To Pediatric Dentistry

Oral Habits

- Bruxism is the nonfunctional grinding or gnashing of teeth. It occurs most often during sleep, however, some children grind their teeth when awake. It results in wear of teeth and can cause masticatory muscle soreness and TMJ pain. Local factors include occlusal interferences or high restorations. Systemic factors include deficiencies, allergies, endocrine disorders, musculoskeletal disorders and mental retardation. Most children outgrow the habit and treatment is unnecessary. For those that don't treatment consists of:
- Equilibration of the occlusal interferences
- Referral to medical personnel to rule out systemic psychological problems
- Fabrication of a night grinding appliance

Introduction To Pediatric Dentistry

Eruption Problems

- Natal/Neonatal Teeth
- Over-Retained Teeth
- Diastemas
- Orthodontic Problems
- Ectopic Eruption
- Ankylosis
- Unequal Resorption
- Congenitally Missing Teeth

Introduction To Pediatric Dentistry

Eruption Problems

- Natal/Neonatal Teeth: natal teeth refer to teeth present at birth. Neonatal teeth refer to teeth erupting within one month of birth. The teeth tend to have abnormal roots. Treatment is dependant on the mobility of the teeth and feeding problems. If the teeth are mobile with the strong possibility of aspiration, they should be extracted. If the mother finds breast-feeding painful because of irritation by the tooth on the breast, a composite material can be placed on the incisal surface of the tooth to reduce the sharpness of the tooth. More radical measures would include bottle-feeding the child or extraction.

Introduction To Pediatric Dentistry

Eruption Problems

- Over-Retained Teeth: over-retained of primary teeth is due to delayed resorption of the roots due to lingual positioning of the permanent teeth due to crowding of the permanent teeth, root canal obliteration (trauma) failure of endodontic obturation material to resorb, and bruxism. The timing of treatment is dependent on which is involved.
- In the mandibular arch, if the primary tooth is mobile allow the tooth to exfoliate on its own. However if the tooth is not exfoliated by age 8 or three quarters of the root of the permanent tooth is formed, the primary tooth should be extracted, once the primary tooth is no longer present the permanent will migrate labially spontaneously.
- In the maxillary arch, even if the primary teeth are mobile they should be extracted to prevent the permanent tooth from erupting in cross-bite, orthodontic intervention will be necessary to move the tooth into its proper position as the interference by the mandibular incisor will prevent spontaneous labial migration. If the permanent tooth is erupting labially, extraction of the primary tooth is not urgent.

Introduction To Pediatric Dentistry

Eruption Problems

- Diastemas: a diastema is defined as spacing between the maxillary central incisors. It is common and desirable in the primary and mixed dentition. The lack of a diastema in the primary and mixed dentition is indicative of potential crowding in the permanent dentition. The etiology of large diastema (more than 2 mm) is a deep bite, a tooth size discrepancy (length/width), a large frenum, and presence of supernumerary tooth. Treatment may involve a combination of orthodontic treatment, veneers or crowns, and surgical removal of the enlarged frenum after completion of orthodontic treatment.

Introduction To Pediatric Dentistry

Eruption Problems

- Orthodontic Problems: The practitioner should be aware the interceptive orthodontic treatment initiated during the primary and mixed dentition. The practitioner should follow adage “When in doubt, send it out”.

Introduction To Pediatric Dentistry

Eruption Problems

- Ectopic Eruption: is a malposition of a permanent tooth bud resulting in the tooth erupting in the wrong place. The most common areas are the maxillary first molars, followed by the maxillary cuspids.
- The maxillary first permanent molar is due to mesial positioning or inclination of the tooth into the second primary molar. This can result in delay of eruption of the first permanent molar and resorption of the distal root of the second primary molar. Treatment consists of: placement of separating elastics, brass ligature wire or orthodontic appliance to distalize the first molar. Contour the distal of the second primary molar. Extraction of the second primary molar and placement of a distalizing appliance.

Introduction To Pediatric Dentistry

Eruption Problems

- Ectopic Eruption: is a malposition of a permanent tooth bud resulting in the tooth erupting in the wrong place. The most common areas are the maxillary first molars, followed by the maxillary cuspids.
- Maxillary cuspid is due to the mesial inclination of the permanent cuspid becoming impacted in the palate or impacting on the root of the lateral incisor. A clinical indicator is distal tipping of the lateral incisor crown. Panoramic, periapical and occlusal position of the cuspid relative to the lateral incisor. Treatment consists of: Extraction of the primary cuspid. Orthodontic lassoing of the permanent cuspid.

Introduction To Pediatric Dentistry

Eruption Problems

- Ankylosis: is an interruption of tooth eruption due to the formation a solid union between the root and bone. It is mostly seen in mandibular molars and traumatized anterior teeth. Submersion is due to alveolar growth surrounding the tooth. In the posterior teeth the submersion of the ankylosed tooth may cause mesial tipping of the permanent first molar. Treatment: in primary molars: observe as the tooth may eventually exfoliate. If the ankylosed primary tooth is interfering with the eruption of the bicuspid extract the primary tooth and place a space maintainer. If a permanent tooth is not present build up the primary tooth with composite of a stainless steel crown.

Introduction To Pediatric Dentistry

Eruption Problems

- Unequal Resorption of the roots of the primary molars results in over-retention of the teeth. If untreated there may displacement of the permanent tooth. Treatment consists of extraction of the primary tooth. As the permanent teeth may be close to eruption space maintenance may be required.

Introduction To Pediatric Dentistry

Eruption Problems

- Congenitally Missing Teeth (anodontia complete failure of teeth to develop is extremely rare, hypodontia is partial anodontia, more common). The most frequent absent teeth in children are mandibular second premolars , maxillary lateral incisors and maxillary second premolars. The congenitally missing teeth may be bilateral or unilateral. If a primary tooth is missing the permanent tooth will usually be missing. However, if a primary tooth is present a permanent tooth can be missing.
- Treatment: In the primary or mixed dentition partial dentures can be placed to replace the missing teeth. In the permanent dentition orthodontics, boded prosthetics and implants are use to replace the missing teeth.

Introduction To Pediatric Dentistry

Early Tooth Loss and Space Maintenance

- Anterior Tooth Loss
- Posterior Tooth Loss
- Band and Loop Space Maintainer
- Lingual Arch Space Maintainer
- Nance Appliance
- Transpalatal Arch Appliance

Introduction To Pediatric Dentistry

Early Tooth Loss and Space Maintenance

- Anterior Tooth Loss: early tooth loss in the anterior region can be result of traumatic avulsion or extraction of carious or infected teeth. Anterior tooth loss does not result in space loss if the primary cuspids are erupted. The lack of teeth does not interfere with the child's ability to eat. However it may interfere with speech if teeth loss occurs before speech development is complete . The most valid reason to replace anterior teeth is for aesthetic as lack of teeth may harm the patients self image. Teeth replacement can be accomplished with cemented or removable appliances. The “pedo partial” is a simple yet effective replacement for extracted anterior teeth. Orthodontic bands are fitted on the posterior molars. An impression is taken and sent ti the lap with fitted bands. Primary denture teeth are available to fabricate a natural looking appliance.

Introduction To Pediatric Dentistry

Early Tooth Loss and Space Maintenance

- Posterior Tooth Loss: premature loss of a posterior primary tooth results in mesial tilting of the tooth distal to the extraction space due to the mesial direction of eruption of the first permanent molar. The lack of space prevents eruption of the permanent tooth into its proper position. To maintain the space and allow normal eruption of the permanent tooth a space maintainer is placed. Depending on the location of the extraction site there are a variety of space maintainers from which to choose. Space maintainers are left in place until eruption of the permanent teeth.

Introduction To Pediatric Dentistry

Early Tooth Loss and Space Maintenance

- Band and Loop Space Maintainer: the indication for placement of a band and lop space maintainer is for loss of a first primary molar. A band is placed on the second primary molar and wire loop extends to the distal of the primary cuspid. It is contraindicated to maintain the space for a missing second primary molar. The band and loop would extend from the first permanent molar to the first primary molar to maintain space for the second premolar. However, the first primary molar exfoliates before the second premolar erupts and the band and loop would lose its source of anchorage. Therefore a lingual or palatal holding arch should be placed. An exception to the rule is if the permanent mandibular anterior incisors are unerupted. There is a possibility that the lingual arch wire will interfere with the eruption of the incisor. In this case a band and loop space maintainer is placed temporarily. When the mandibular incisors erupt a bilateral space maintainer is inserted.

Introduction To Pediatric Dentistry

Early Tooth Loss and Space Maintenance

A bilateral space maintainer is indicated for loss of more than one tooth in a quadrant or loss of a second primary molar. Three examples of bilateral space maintainers are :

- Lingual Arch Space Maintainer
- Nance Appliance
- Transpalatal Arch Appliance

Introduction To Pediatric Dentistry

Early Tooth Loss and Space Maintenance

- Lingual Arch Space Maintainer the indication are: Bilateral loss of the mandibular primary molars after eruption of the permanent incisors. Unilateral loss of more than one tooth in the mandibular arch.

Introduction To Pediatric Dentistry

Early Tooth Loss and Space Maintenance

- Nance Appliance : the indications are bilateral loss of the maxillary primary molars or unilateral loss of more than one tooth in the maxillary arch.

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Early Tooth Loss and Space Maintenance

- Transpalatal Arch Appliance the indications are bilateral loss of the maxillary primary molars or unilateral loss of more than one tooth in the maxillary arch. Its design is o bilateral bands on molars that are connected by a heavy wire that transverses the hard palate without touching soft tissue. Although it is easier to clean than the Nance appliance it is not as stable.

Introduction To Pediatric Dentistry

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