Pediatric Dentistry

Examination of mouth and other Relevant Structures

Lec -1- **5th class**

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Ethics and consent:

In any clinical dental practice, Provision of dental care for a child patient represents a challenge. This is initially attributed to the need to take into account many factors during history taking and clinical examination of these young patients, in addition to the need to design a realistic treatment plan that could suit each patient individually.

The fundamental ethical responsibility of any dentist treating a child patient is to do no harm, to act in the child's best interest, and to respect the child's right to reject treatment. However, the dentist may sometimes need to proceed with a procedure that the child is not completely satisfied with. This is only viable when the procedure is in the best interest of the child, when there are no other alternatives, when delaying the procedure will complicate the treatment, when failure to provide the procedure will cause pain and distress to the child, and only when a valid consent is being taken from the parents. Consent is the permission given by a person or parents (in cases of children aged less than 16) before receiving any type of medical examination, test or treatment. It must be done on the basis of an explanation by a clinician and it could be verbal or written.

Although having a valid consent for examination, investigation and treatment is important, it is substantial to ensure that the patient and parents understand the nature and purpose of the proposed procedure, any alternatives available, and the potential risks and benefits. It is also important to ensure the relativeness of the adult accompanying the child and make sure that at least one of the parents knows the proposed treatment as the childminders, grandparents and teachers may not have the total authority to consent. However, the dentist could proceed without the parental presence, only when the child's life is in danger, or when the condition would deteriorate irreversibly

Successful dental treatment for children can be achieved by recording a detailed history, a complete clinical examination, appropriate investigations, a thoughtful diagnosis and an appropriate treatment plan.

A dentist is traditionally taught to perform a complete oral examination of the patient and to develop a treatment plan based on the examination findings, then makes a case presentation to the patient or parents, outlining the recommended course of treatment. This process should include the development and presentation of a prevention plan that outlines an ongoing comprehensive oral health care program for the patient and establishment of the "dental home."

It is recommended that the first examination for the child be done at the time of the eruption of the first tooth and no later than 12 months of age. Early detection and management of oral conditions can improve oral health and, in turn, the general health and well-being of the child.

Notes: Obtaining accurate data in a child is very difficult. The reasons may be any of the following:

1. Most of the times, it is the parent or the guardian who will be providing the required data about the child and not the child himself or herself.

2. It is impossible to observe everything a child does or says and make accurate records of what goes on.

3. Most children do not behave in the dental clinic the same way as they do at home or with their friends or teachers.

4. Data reported by parents and teachers may be inaccurate.

5-Unless reports are made immediately after the observation, the parents may forget to mention minor yet important findings.

6.Information provided by parents or guardians is dependable on their emotional maturity.

THE DIAGNOSTIC METHOD

A thorough history, detailed examination and an accurate diagnosis, all of them are very essential for successful outcome of any treatment. Diagnosis and treatment planning thus includes assembling all the relevant facts obtained through history and examinations and then to analyze each of them for determining the course of treatment .

Patient's or parents' chief concern should be in the first line. Some pathognomonic signs may lead to an almost immediate diagnosis. For example, obvious gingival swelling and drainage may be associated with a single, badly carious primary molar. Although these associated facts are collected and evaluated rapidly, they provide a diagnosis only for a single problem area. On the other hand,a newly fractured crown needs immediate treatment, but the treatment will likely be only palliative, and further diagnostic and treatment procedures will be required later.

**History:

With any dental consultation, the first thing that the dentist will do is to take a history from the patient.

This history will include:

1- Personal details: The dentist should register the patient's name, age, address, and telephone number. Knowing the chronological age of the child is very important when evaluating the child's dental age, sequence of teeth eruption, eligibility of primary molars for pulp therapy and other considerations.

2- Presenting complaint(s): This should include a question about why the child has come to the dental office or what they are seeking from the dental treatment. It is a good practice to ask the child this question prior to asking his parents, although the dentist should be prepared to receive different answers from these two sources. If the child chief complaint is pain, the history of pain should be recorded (onset, nature, duration, frequency, exacerbating and relieving factors).

3- Dental history: For any paediatric dentist, obtaining information regarding the child's previous dental treatment is essential in order to design a particular treatment plan that would fit the patient based on the

manner of his/her reaction to the previous treatments. Other information could be of particular importance because they may be the causative factors for the existing oral and dental problems. These involve information regarding oral hygiene (frequency of brushing and type of toothpaste used), dietary habits (including between meal snacks and bottle feeding at bedtime for the younger patients), as well as dummy/digit sucking. A question about the regularity of previous dental attendance may give the dentist an indicator for a plan that could fit the parental attitude of their child's dental treatment.

4- Social (family) history: This is an important section in history taking, as the dentist can use it to engage the child in the conversation. In this section, the dentist can record information regarding the child's parents, siblings, and favorite subjects at school to use them later as 'ice-breakers' in the future appointments.

5- Medical history: Taking a comprehensive medical history should precede any dental treatment. This is fundamental because general health problems could not only cause oral problems, but they may also affect the delivery of oral or dental care. Health problems of most significant impact on oral health involve: allergies, severe asthma, diabetes, cerebral palsy, cardiac diseases, haematological disorders, and oncology. From the medical history, the dentist should obtain information regarding any previous hospitalisation or operations, allergies, current medications, any previous or current problems associated with each of the major systems (CVS, CNS, haematological, respiratory, immunological, endocrine, gastrointestinal, and skeletal).

At the end of medical history taking, it is a good practice to ask the parents if there is anything else they think the dentist should know about their child. This is a useful approach in relation to children who have behavioural or learning problems, such as autism

Clinical examination of the pediatric dental patient not only includes intra- and extra oral examination but also comprise of complete general examination, it may include an assessment of the following :

- General growth and health
- Chief complaint, such as pain and swelling …etc.
- Extra oral soft tissue and temporomandibular joint evaluation
- Intraoral soft tissue
- Oral hygiene and periodontal health
- Intraoral hard tissue
- Developing occlusion
- Caries risk
- Behavior
- Additional diagnostic aids are often also required, such as radiographs, study models, photographs, pulp tests, and, infrequently, laboratory tests.

COMPONENTS OF ORAL EXAMINATION AND DIAGNOSIS

1) Recording the history (medical, dental and familial):-

2) Examination of the patient (clinical and radiographical)

3) Provisional diagnosis

4) Special examination

5) Final diagnosis

6) Treatment plan (including medical referral)

✧Notes:

1) Dental history:- Include: Previous care (treatment) in the dental office Oral hygiene. Habits. Previous and current fluoride therapy.

2) Information regarding the child's social and psychological development is important. Mentally retarded child can be determined by asking question

about the learning process and the child's behavioral and communication problem.

3) Behavioral history include any behavior problems in the dental office, which are often related to the child's inability to communicate with the dentist and to follow instructions .

CLINICAL EXAMINATION

*General Examination:

General well-being of the child can be examined by a brief survey of the entire child's body. In addition to examining the oral cavity structures, the dentist may in some cases wish to note the patient's size, stature, gait, or involuntary movements. The first clue to malnutrition may come from observing a patient's abnormal size or stature. Similarly, the severity of a child's illness, even if oral in origin, may be recognized by observing a weak, unsteady gait of lethargy and malaise as the patient walks into the office.

General examination include the examination of the following:

1. **Head, hair, face, neck and hands**

Abnormalities in size, shape, symmetry, function of head and neck may indicate various syndromes that may be associated with oral abnormalities. Inspection and palpation of the patient's head and neck are indicated. Unusual characteristics of the hair or skin should be noted. The dentist may observe signs of problems such as head lice, ringworm, or impetigo during the examination. Proper referral is indicated immediately, because these conditions are contagious.

The patient's hands may reveal information pertinent to a comprehensive diagnosis. (How?)

-The dentist may first detect an elevated temperature by holding the patient's hand.

-Cold, clammy hands or bitten fingernails may be the first indication of abnormal anxiety in the child.

-A callused or unusually clean digit suggests a persistent sucking habit.

-Clubbing of the fingers or a bluish color in the nail beds suggests congenital heart disease, which may require special precautions during dental treatment.

2) Temporomandibular joint evaluation

The dentist should evaluate temporomandibular joint (TMJ) function and the associated musculature by palpating the head of each mandibular condyle and by observing the patient while the mouth is closed (teeth clenched), at rest, and in various open positions.

Sore masticatory muscles (that may detected by pain, deviation and restricted mouth opening) may also signal TMJ dysfunction. Such deviations from normal TMJ function may require further evaluation and treatment. There is a consensus that temporomandibular disorders in children can be managed effectively by the following conservative and reversible therapies :patient education, mild physical therapy, behavioral therapy, medications, and occlusal splints.

**Mouth opening (which is normally 40–45 mm) is also related to TMJ function and should be examined

3. Lymph nodes

The extra oral examination continues with palpation of the patient's neck and submandibular area and any deviations from normal, such as unusual tenderness or enlargement, should be noted and follow up tests performed or referrals made as indicated.

4. Lips, Chin and tongue

If the child is old enough to talk, speech should be evaluated. The positions of the tongue, lips, and perioral musculature during speech, while swallowing, and at rest may provide useful diagnostic information.

*Chin prominence is related to mandibular position.

*Lips normally should be competent (touch each other lightly or with 0-1 mm of gap). When the lips do not approximate each other at rest, they are termed as incompetent

INTRA ORAL EXAMINATION

Soft Tissue examination

Hard Tissue examination

Soft tissue examination

- It includes examination of the oral mucosa and examination of periodontal tissues.Complete inspection and palpation of all the oral soft tissues is important to evaluate the condition of the oral soft tissues and the status of developing occlusion. In addition, unusual breath odors or abnormal quantity or consistency of saliva should be noted.
- During examination of intraoral soft tissue ***Gingiva** should be examined:

-High maxillary labial frenal attachment may be responsible for abnormal spacing between the central incisors.

-Redness and swelling of gingiva may be seen associated with gingivitis.

-Draining fistula on the attached gingiva accompanied by a tooth that is tender, painful and mobile are usually diagnostic of abscessed teeth.

-Assessment of the oral cleanliness and the presence of plaque and calculus should be done.

-The presence of profound gingival inflammation in the absence of gross plaque deposits, prematurely exfoliating teeth, or mobile permanent teeth may indicate a serious underlying disease.

* Tongue

- The size, shape, color and movement of the tongue should be noted

- Dryness of tongue—indicates dehydration.

-Tongue is coated in febrile state.

-Abnormal lingual frenum can result in ‘tongue tie’

* Salivary flow rate and quality:

It may be thin, normal or viscous.

Altered secretions are seen in systemic conditions such as mumps, Sjogren's syndrome, etc...

***Tonsils:**

Enlarged tonsils with purulent exudates may be the initial sign of streptococcal infection leading to rheumatic fever. When streptococcal throat infection suspected immediate referral of the child to the physician is indicated. Obtaining throat culture while the child is on the dental chair is helpful for the physician.

Notes:

*Soft tissue should be examined for **3C's,** change in the color, contour and consistency.

Change in the color:

It may be a change to red (inflammation), blue (hematoma, bruise) or white (electric or thermal burns, candida infection).

Change in the contour:

It may be due to either a swelling (abscess, papilloma) or ulcer (aphthous, traumatic)

Change in the consistency:

It may be soft (inflammation), firm (mucocele) or hard (bony exostosis).

Hard tissue examination

A)Careful evaluation and inspection of individual teeth should be done for:

***Teeth number**:

***Evidence of carious lesions**:

***Hereditary or acquired anomalies**

***Tooth structure:**

***Trauma**:

*__Tooth mobility__ —physiological/pathological.

__* Discoloration:__ extrinsic, or an intrinsic reason.

* Identification of carious lesion is important in patients of all ages but it is especially critical in young patients because the lesion may progress rapidly in early childhood caries if not controlled. Elimination of caries, restoring the teeth as needed, can prevent pain and the spread of infection and contribute to the stability of the developing occlusion.

Note: Examinations of teeth start in upper right quadrant work around the maxillary arch move down to the lower left and end in the lower right.

B) Examination of occlusion

Dental or skeletal abnormalities may undergo considerable changing during childhood and early adolescence. This dynamic developmental process occur in all three planes of space and with periodic evaluation, the dentist can intercept and favorably influence undesirable change . Monitoring of patient facial profile and symmetry, molar, canine, and anterior segment relationship, dental midlines, overjet and overbite, physiological spacing, presence of crowding/spacing; severe skeletal abnormalities, arch length to tooth mass comparison should be routinely included.

Radiological examination

Radiograph should be taken before comprehensive oral health care plan can be developed and subsequent radiographs are required periodically to detect incipient caries or other developing anomalies .A child should be exposed to dental ionizing radiation only after the dentist has determined that radiography is necessary to make an adequate diagnosis for the individual child at the time of the appointment. Sometimes, obtaining isolated occlusal, periapical or bitewing radiograph is indicated .

In very young children (even infants) because of trauma, toothache, suspected developmental disturbances, or proximal caries. Carious lesions appear smaller on radiographs than they actually are. If the pediatric patient can be motivated to adopt a routine of good oral hygiene many of these initial lesions can be arrested

Treatment planning

Treatment planning is the orderly arrangement of the various treatment needs of the patient to provide maximum benefit to the patient as a whole.

Anticipatory guidance is the term that often used to describe the discussion and implementation of such a plan with the patient and/ or parents .

Treatment priorities

Planning the treatment can be made based on different phases:

1-Emergency phase

2- Medical/referral phase

3- Systemic phase

4-Preventive phase

Emergency phase

All the problems that require immediate actions, such as relieving the child from pain,infection, attending due to a trauma, etc. should be done in this stage..

Medical/referral phase

In this phase, patients with positive medical history should referred to pediatrician for evaluation and consent.

Systemic phase

Any medication given to modify dental treatment is included in this phase, such as premedication for behavior management or antibiotic prophylaxis to a child with congenital cardiac defect.

Preventive phase

This phase is the first phase of treatment. It is aimed at providing preventive therapy to prevent or minimize dental disease. A plaque control program should be done that include plaque identification and removal,

diet counseling, topical fluoride application and child parent education on home care oral hygiene practice.

This phase includes :

-Oral prophylaxis and fluoride treatment

- Pit and fissure sealant application

-Oral hygiene counseling

-Diet counseling

-Orthodontic consultation

Corrective phase

It includes providing treatment or management of the disease process. It include

- Extractions

-Restorations

-Restorative therapy : A procedure that is short and simple should be selected first during this initial appointment to allow the development of patient trust and confidence. Minor surgical procedures, Space maintainers, Minor orthodontic corrections-Prosthetic rehabilitation

**Orthodontic and prosthodontic care following the completion of the restorative phase of treatment that may be render if needed.

Maintenance and recall

Patients are recalled at regular intervals following the completion of the required treatment for evaluation and necessary follow up.. Patients at high risk are maintained at 2-3 months recall and low risk at 6 months recall.

**No treatment plan is completed until provision is made to provide a recall appointment for evaluation and necessary follow up care

Advantages of Treatment Planning

1. Avoiding the re-diagnosis at every visit.

2. Give serial appointments on the first day as the patient's treatment needs that are already planned in a sequential order (step-by -step guideline).

3. Instruments can be prepared well in advance before the patient's arrival for the treatment.

4. Estimation of the time and no. of appointments required as well as the total fee

 Treatment plan must be discussed with the parents and permission taken before performing any treatment. The followings information must be taken: 1- Dental need of their child including the treatment as well as the preventive measures.

2-Amount of time required to perform the treatment and the total cost .

Lec -2- Pediatric Dentistry

5th class

Children Behavioral management

Behavior Management The dental health team effectively and efficiently performs treatment to the child by the means of behavior management, so our aim is to create a positive dental attitude to the children. They are basically about communication with the pt. and his parents and about educating the child how to behave in dental clinic to decrease the anxiety and fear and to promote understanding to achieve good oral health.

**Individuals usually differ. Therefore, the appropriate management should be chosen depending on the individual's needs, every practitioner integrates his/her personality on the basic psychological principles in managing children, so what works with one may not necessarily work with the other.

Definitions

***Behavior:** It is an observable act, which can be described in similar ways by more than one person.

*** Child dental management:** defined as the means by which a course of treatment for a young patient can be completed in the shortest possible period, while at the same time ensuring that he will return for the next course willingly.

The goals of behavior management are:

1 • To establish communication with the child and the parents.

2• Alleviate fear and anxiety to provide a relaxing and comfortable environment for the dental team to work in, while treating the child.

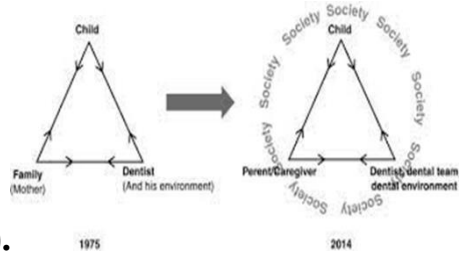
3• Deliver quality dental care

4• Build a trusting relationship between dentist, parent and child.

5• Promote child's positive attitude towards oral/dental health

**** Different from adult patient management **HOW??**

A major difference between the treatment of children and the treatment of adults is the relationship. Treating adults generally involves a one- to -one relationship, that is, a dentistpatient relationship. Treating a child, however, usually relies on a one-to-two relationship among the dentist, the patient, and parents or caregivers. This relationship, known as the **(pediatric dentistry treatment triangle).**



Child development

Development implies a sequential unfolding that may involve changes in size, shape, function, structure, or skill.

Major area of development

1. **Physical development** Physical development is a term used to describe the child's total physical growth and efficiency from the moment of conception until adulthood together. The broad area of physical development involves changes that occur in children's size, strength, motor coordination, functioning of body systems, and so forth.. Each child is unique and may develop at varying rates relative to their same-aged peers, For example, one child may present with strong motor skills but less well-developed language, while this may be the opposite for another same-age peer. Typical personality characteristics related to specific **chronologic ages** that have relevance to dentistry are listed below which can help in the development of behavioral guidance strategies:

Age-Related Psychosocial Traits and Skills

2- to 5-Year-Old Children (This trait help us n determining chronological age of child)

TWO YEARS

Geared to gross motor skills, such as running and jumping Likes to see and touch

Very attached to parent Plays alone;

rarely shares

Has limited vocabulary;

shows early sentence formation

Becoming interested in self-help skills

THREE YEARS

Less egocentric; likes to please

Has very active imagination; likes stories Remains closely attached to parent

FOUR YEARS

Tries to impose powers Participates in small social groups Reaches out—expansive period Shows many independent self-help skills Knows "thank you" and "please"

2. **Social development**

It include both interpersonal relationships and independent functioning skills. An important process for dentists is the child's growth toward independent functioning. For their survival, infants are dependent on others to clothe, feed, and nurture them. As children grow and their ability to care for themselves improves, they gain social independence. Many young children want to brush their own teeth but lack sufficient digital dexterity. Parents, on the other hand, understand the lack of digital skills and often insist on attending to their children's oral health care.

3-Intellectual development (mental development) Intellectual development is probably the area most comprehensively studied. It is a method that employed quantified mental abilities in relation to

chronologic age. It led to the concept of the intelligence quotient (IQ), which was measured by tasks examining memory, spatial relationships, reasoning, and a variety of other primary mental skills. This enabled an examiner to determine a child's mental age based on performance.

The basic Binet IQ formula used is: IQ= (mental age/ chronological age) × 100

Therefore, the child whose mental age and chronological age were identical had an IQ of 100. The 8-year- old child whose mental age was 6 would have an IQ of 75(6/8×100=75), and the 4-year- old child with 6-year mental age would have an IQ of 150 (6/4×100=150). dividuals with intelligence deficiency or intellectual disability may require special behavior guidance.

Anxiety and Fear:

Fear (Apprehension based on history): Fear sets in a series of physiological responses to prepare a subject for fight/flight response The subject is able to pinpoint what he/she is afraid of e.g. fear of needle.(source is known)

. **Anxiety** (Fear of the unknown): It is one of the primary emotions acquired soon after birth. It is a personality trait and is apprehension, tension or uneasiness that stems from anticipation of danger, the source of which is largely unknown or unrecognized.

Phobia (Pathological fear): It is persistent, excessive, unreasonable fear of a specific object, activity or situation, attached to a certain stimulus.

Fears are of two types:

A child may experience two types of fear during dental treatment:

1. **Objective fears 2. Subjective fears**

Objective fears: These are acquired or produced by direct physical stimulation of the sense organs (seen, felt, smelt, or contacted) but not of parental origin, which are disagreeable and unpleasant in nature.

EX: • Fears from previous unpleasant contact with dentistry ,smell of hospital

Subjective fears: These are based on the feelings and attitudes suggested to the child by others without the child personally experiencing them. It difficult to eradicate. Displayed emotion in parent's face creates more impression than verbal suggestions. Even a tight clenching of the child's hand in dental office while undergoing dental treatment crates fear in child's mind about dental treatment. These fears also develop from friends, playmates, reading books and periodicals, watching media and theater and depend on repetition.

****Value of fear:** Fear lowers the threshold of pain so that every pain produced during dental treatment becomes magnified

**VARIABLES INFLUENCING CHILDREN'S DENTAL BEHAVIORS

Dentistry has had some difficulty identifying the stimuli that lead to misbehavior in the dental office, although several variables in children's backgrounds have been related to it.

Those variables are of two types:

1. Major variables

2. Minor variables

1. Major variables

(1) Parental anxiety

Children when they are very young, they learn everything from their parents, that is what we called (**primary socialization**), it lasts for life long, but its effect is reduced when the children go to the school and we call it here (**secondary socialization**), it is an ongoing and gradual process, so parents can shape their children's attitude toward oral health.

The importance of the **maternal anxiety** has been reported and recognized for over 100 years, especially for those less than 4 years old. Parents are also capable of predicting their child's behavior. They can pretend if he is going to cooperate or not, and it's well documented, if the child's mother is anxious, or she can't even look while we're doing the treatment we can ask another member to come with the child to the clinic, so if the parents are afraid of dentists the child of course will be afraid

too. In the past, it has been customary for mothers, more often than fathers, to accompany children to the dental office. Children respond with tension and fear primarily because of the way dental experiences have been described to them. The problem of dental fear is not specific to dental situations or procedure. The behavior of a child is found to be directly proportional to the level of parental anxiety in which a significant correlation between maternal anxiety and a child's cooperative behavior at the first dental visit. Children of mothers with high anxiety levels exhibit more negative and uncooperative behavior. High anxiety on the part of parents tends to affect their children's behavior negatively. Children of all ages can be affected by their mothers' anxieties but the effect is **greatest** with those younger than four years of age. This might be anticipated **because** of the child-parent symbiosis that begins in infancy and gradually diminishes.

(2) Past medical history

A child who have had a **negative experience** associated with medical treatments (a **lot of surgeries and a lot of appointments)** will be anxious of dental treatment even though they didn't try it, or maybe a negative experience from previous bad dental visit. Children with pleasant past medical experiences are more likely to be cooperative; but past experience of pain or negative attitude of the child towards physician results in a negative behavior in the dental operatory. The emotional quality of past visits rather than the number of visits is significant. The behavior of children with **special health care needs** may differ from that of healthy children. Those with **chronic medical conditions** (without developmental delay) can become "**adultified**." Because of recurring medical experiences, they may become accustomed to the health care setting and behave "**better"** than expected. Pain during previous health care visits is another consideration in a child's medical experiences. Previous surgical experiences adversely influence behavior at the first dental visits, but this was not the case in subsequent visits.

(3) Awareness of dental problems When a child came to the dental clinic with cellulites, with pain, and he didn't sleep the whole night, his first dental visit will be anxious, because he knew that something will going to happen. Ideally, we prefer to see the child for the first time for checkup, hence, children who know they have a dental problem, exhibit

more negative behavior at the first dental appointment. Some children visit the dentist when they are made aware of an existing problem .The problem may be as serious as a chronic dental abscess or as simple as extrinsic staining of the dentition. However, there is a tendency toward negative behavior at the first dental visit when the child believes that a dental problem exists which is likely to make them more apprehensive as the question “what will be done" comes in their minds.

2. Minor variables

(1) Socio-economic status of the family directly affects child's attitude toward the values of the dental health process. Those of low socio-economic class, below average education, have a tendency to attend dental needs when symptom dictates.

(2) Position of the child in the family (rank of the child) The older child may become more anxious than children born later while middle child is usually more outgoing and suggestible because he use his older sibling and parent as behavior pattern to follow.

(3) Child gender. The clear effect of the child gender on behavior can be seen in the dental environment for example boys are expected to be brave stronger than girls (boy act as a man and does not cry). Girls exhibited more dental anxiety and dental behavior management problems than did boys.

(4) Child age There different types of fear at different ages, like in 2-4 years fear of imaginary creatures and small animals then 4-6 years start social and school fear. Fear related to injury, death and so on is shown in those 6 years to adolescent.

(5) The experiences of a child during formal learning at school, summer camps or peer-interactions may be of help to the dentist in determining their level of cooperation. Those attend nursery school cooperate more with the dental procedure. Communication technologies and media also have a strong influence on the child's behavior.

(6) Modeling or imitation It can be considered as the most effective means to introduce the child to dentistry, also it is effective for patients who have no previous dental visit.

Some general consideration of pediatric patients' management:

1. Always call the patient by his (first/ nick) name.

2. Direct the conversation toward the child whenever possible.

3. Talk at the child's level (physically and mentally).

4. Avoid quick and sudden movements while performing the procedure.
5. Avoid fear promoting words.

6. Communicate with the patient, but once the treatment starts you need to use short commands.

7. Admire and praise the good behavior, because children like to please adults.

8. Keep self-control all the time, it's not acceptable to lose it, especially while dealing with the pediatric or handicapped patients.

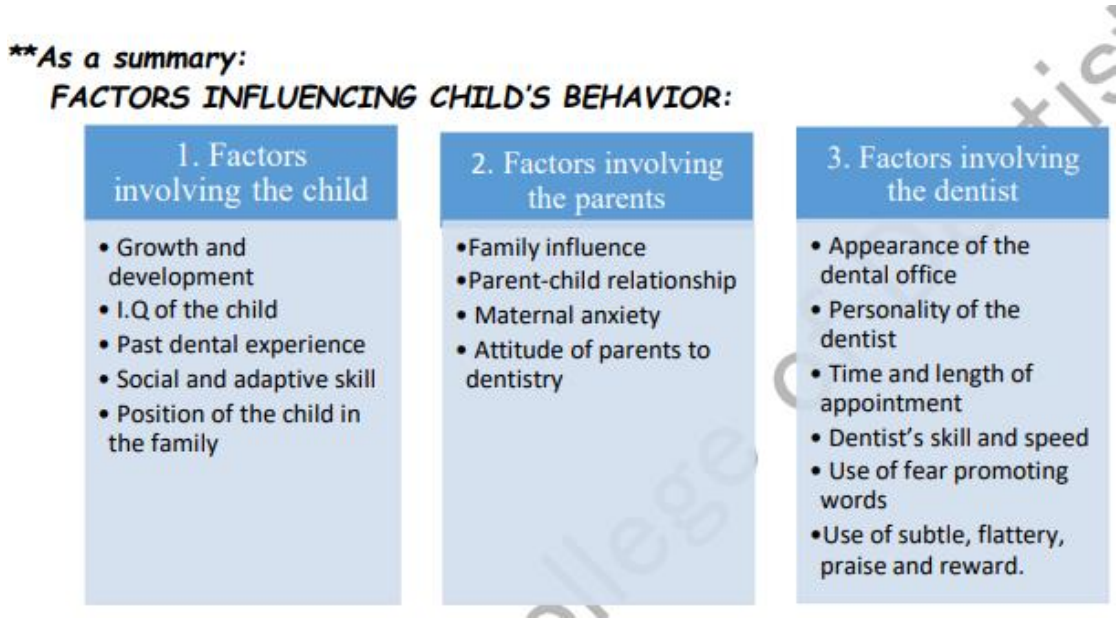
Some factors that might contribute to the child's behavior (related to the dentist):

1. Scheduling: When to see the patient is very important. Most children are fresher in the morning, we prefer see them in the morning specially pre schooled ones, and we prefer same age group to be there at the same period, so they will be comfortable when they see children who are from their age group, another thing is how much will they wait? Because waiting too much in the reception area leads to tiredness and restlessness.

2. Appointment length: new researches suggested to treat each (Quadrant) in each appointment (ex: to treat The 6+E+D at one appointment) creating less numbers of appointments, usually the patient loses his concentration if the appointment is more than 30-45 minutes). On the other hand, one clinical study stated that the length of the appointment does not affect the behavior negatively and another one stated that it affects the behavior positively.

3. Dental Attire: Some Pediatrics have a negative experience toward the white coat and the mask, especially those who were under GA, and this makes their management harder, so some pediatric dentists tend to wear

colorful clothes, but some of them refuse that because they say it is less professional, thus "the dental attire" is a personal choice.



Behavior patterns of a child can be classified in various ways:

I) According to age

• Pre-cooperative stage-less than 2 years

• Cooperative stage-above 2 years The pattern of child behavior at certain age with expected development:

* 2-year-old children: Dentists sometimes refer to such children as being in the precooperative stage and often referred to as being in the stage of the “terrible twos.”

* 3- year-old children: Children communicate more easily than 2 years old, but they need their parents to remain with them in clinic to feel more security.

* 4- year-old children: The child usually listens and has a response with interest to dentist explanation and verbal direction.

* 5- year-old children: If the child properly prepared by the parents, he will have no fear of new experience.

*6- year-old children: The child need proper introduction about dental treatment in order to respond in a satisfactory manner because the tensional manifestation rise to peak at this age.

II) According to Clinical classification of behavior patterns Wright's clinical classification places children in one of three categories:

• Cooperative

• Lacking cooperative ability

• Potentially cooperative

Cooperative children are:

1) Reasonably relaxed.

2) They have minimal apprehension and may even be enthusiastic.

3) They can be treated by a straightforward,

Lacking in cooperative ability children are

(In contrast to the cooperative children): This category includes

1) Very young children with whom communication cannot be established and of whom comprehension cannot be expected. Because of their age, they lack cooperative abilities
2) Another group of children who lack cooperative ability is those with specific debilitating or disabling conditions. At times, special behavior guidance techniques are used for these children. Although their treatment can be carried out, immediate major positive behavioral changes cannot be expected.

Potentially cooperative

This type of behavior differs from that of children lacking cooperative ability because these children have the capability to perform cooperatively. They have the ability to cooperate but they choose not to (the most challenging pts.) and they are the most common pts you are going to meet. This is an important distinction. When a child is characterized as potentially

cooperative, clinical judgment is that the child's behavior can be modified; that is, the child can become cooperative.

The adverse reactions have been given specific labels for descriptions of potentially cooperative patients, so that **potentially cooperative group are **further categorized** as follows:

1. **Uncontrolled behavior**

• Seen in 3-6 years. • Tantrum may begin in the reception area or even before. • This behavior is also called as 'incorrigible'. Tears, loud crying, physical lashing out and flailing of the hands and legs-

all suggestive of a state of acute anxiety or fear.

2. **Defiant behavior (challenging one)** (Also referred to as **"stubborn" or "spoilt"**) When the child starts getting older, he will try to resist you, small children refuse to open their mouth by saying " I don't want to" but when they are a little bit older they will sit and open their mouth but at the same time they will start pushing you by their hands.

• Can be found in all ages, more typical in the elementary school group.

• Distinguished by "I don't want to" or "I don't have to" or "I won't".
• They protest when they are brought to the dental clinic against their will, as they do at home.

• Once won over, these children frequently become highly cooperative.

3. **Timid behavior**

   They are (Mostly female) they hide their faces by their hands or hide behind their mother and maybe at any time they deteriorate to uncontrolled.

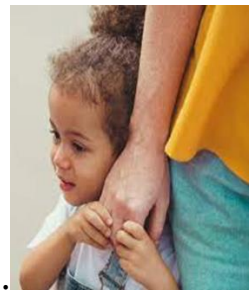
   • Milder but highly anxious.

   • If they are managed incorrectly, their behavior can deteriorate to uncontrolled. May shield behind the parent.

   • Fail to offer great physical resistance to the separation.

   • May whimper, but do not cry hysterically.

   • May be from an overprotective home environment or may live in an isolated area having little contact with strangers. Needs to gain self-confidence of the child



4**. Tense cooperative behavior**

> 7 years, they try to help us but they are very anxious, we call them white knuckles, they hold something with their hand(s) in a constant position, a chair for example so their knuckles become white.

• Border line behavior

• Accept treatment, but are extremely tense

• Tremor may be heard, when they speak

• Perspire noticeably

5-Whining behavior (No pain, no tears) just ''naaaaaa''

Usually continuous, it's annoying.

• They do not prevent treatment, but whine throughout the procedure

• Cry is controlled, constant and not loud

• Seldom are there tears

- These reactions are at times frustrating and irritating to the dented team
- Great patience is required while treating such children.

Lec -4_ The Pharmacological Techniques of behavior management 5th class

In some difficult cases, the dentist can use drugs as an aid in the child's behavior management to provide high quality dental care

The pharmacological approach by using either-:

1- Sedative drugs.

2- G.A. in very difficult cases.

Pharmacologic management is a broad term that describes the use of drugs to manage the behavior of pediatric patients undergoing dental procedures. The types of drugs used include inhaled gases, oral medications, drugs administered via intravenous infusion, intramuscular injection, and other routes of administration. Pharmacologic management is further divided into two subcategories, **sedation and general anesthesia.**

Sedation: is a state of depression of CNS which reduces anxiety so enable treatment to be carried out satisfactory. Conscious sedation is the calming of a nervous apprehensive patient without loss of consciousness .The parent must be agreeable to use cons. Sed .for their children by signing on the consent form for using sedation.

Sedative drugs either by :- inhalation, orally, IV,IM,SC and Rectal .administration

sedation Technique need highly experienced dentist, medical history parent ,instruction to the parent and of the child ,consent form for the documentation

Sedation technique used-:

1. For children who are intensely fearful and anxious and failed to be treated with non-pharmacological approach.

2. For very young children with extensive disease and acute pain

3. Conscious sedation used for children whose lack of cooperative ability because either

psychologically or emotionally disturbed or child with mental or physical disabled.

4 . Children who require extensive dental care and would benefit from prolonged dental visit .

5 . Children who have allergy to local anesthesia .

Degree of sedation:

Minimal sedation–

(anxiolysis) a minimally depressed level of consciousness, produced by a pharmacologic method that retains the patient's ability to maintain an airway independently and continuously and respond normally to tactile stimulation and verbal commands. Although cognitive function and coordination may be modestly impaired, ventilator and cardiovascular functions are unaffected .

Moderate sedation – (Conscious Sedation) a drug-induced patients respond depression of consciousness during which purposefully to verbal commands, either alone or accompanied by stimulation. No interventions are required to maintain a light tactile adequate. patent airway, and spontaneous ventilation is .Cardiovascular function is usually maintained

In Conscious sedation the patient-:

-1Able to independently maintain his airway &continually.

-2Able to independently maintain an open mouth.

-3Respond sensibly to verbal commands.

-4Retain adequate function of protective reflexes (ex:- laryngeal reflex).

Deep sedation – (Analgesia) a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to maintain ventilatory function independently may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained .

General anesthesia – a drug-induced loss of consciousness during which patients are not arousable ,even by painful stimulation. The ability to maintain ventilatory function independently is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired .

Practitioners intending to produce minimal or moderate sedation should be able to diagnose and manage the physiologic consequences of patients whose level of sedation becomes deeper than initially intended. The term "rescue" is often used to describe this management, and refers to steps taken to return the patient to the initially desired level of sedation .

The goals of sedation for the pediatric patient are:

(1)to guard the patient's safety and welfare ;

(2)to minimize physical discomfort and pain ;

(3)to control anxiety, minimize psychological trauma, and maximize the potential for amnesia ;

(4)to control behavior or movement so that the procedure can be completed safely ;

(5) to return the patient to a physiologic state in which safe discharge, as determined according to recognized criteria, is possible .

Pre-treatment Documentation and Assessment Documentation

Each sedation or general anesthetic procedure should be documented in the patient's record by the practitioner. Documentation should include the following :

.1Rationale for sedation or general anesthesia: the dental surgeon should briefly document the reason for the need for sedation or G.A .

.2Informed consent: each patient, parents or other responsible individual is entitled to be informed regarding benefits, risks, alternatives to sedation or G.A. and the patient record should

document that appropriate informed consent was obtained .

.3Instructions to parents or responsible individual: The dental surgeon should provide verbal and written instructions (to parents and responsible individual) which should include clear explanation of pre and post anesthesia precautions potential or anticipated behavior, and limitation of activities .

.4Dietary instructions: food and liquids intake should be limited prior to treatment .

Sedation in pediatric dentistry

The decision to sedate a child requires careful consideration by an experienced team. The choice of a particular technique, sedative agent and route of delivery should be made at a prior consultation appointment to determine the suitability of the child (and their parents) to a specific technique .

The use of any form of sedation in children presents added challenges to the clinician. During sedation, a child's responses are more unpredictable than that of adults. Their proportionally smaller

bodies are less tolerant to sedative agents and they may be easily over-sedated.

Anatomically differences in the pediatric airways include :

•The vocal cords positioned higher and more anterior .

•The smallest portion of pediatric airway is at the level of the subglottis (below cords) at the level of the cricoid ring .

•Children have relatively larger tongue and epiglottis .

•Possible presence of large tonsillar/adenoid mass .

•Larger head to body size ratio in children .

•The mandible is less developed and retrognathic in younger children and infants .

•Children have smaller lung capacity and higher metabolic rate resulting in a smaller oxygen reserve. Hence, children desaturate more quickly than adults do .

Patient preoperative assessment

The preoperative assessment is among the most important factors when choosing a particular form of sedation. This assessment must include :

(1A thorough medical and dental history that include :

.1Allergies or adverse drug reaction that might increase the potential for airway obstruction, such as a history of snoring or obstructive sleep apnea .

.2Current medications (if any including the dose, time, rout and site of administration (

.3Previous hospitalization and past operations (date and purpose)

.4History of previous treatment under general anesthesia or sedation and any associated complications .

.5Family history of diseases or disorders especially those might affect sedation and general anesthesia .

.6Patient medical status (diseases, disorders or physical abnormalities :(

 History of recent respiratory illness or current infections .

 Assessment of the airway to determine suitability for conscious sedation or general anesthesia

)GA .(

 Fasting requirements and the ability of the career to comply with instructions .

 Proposed procedures being performed .

 Patient's weight and vital signs .

.7Review of body systems .

.8Age (in years and months) and weight .

.9Name, address, and contact information of the child’s home .

(2) The physical evaluation which should include the following:

a. Height and weight in kilograms or pounds .

b. Vital signs, including heart and respiratory rates and blood pressure. If determination of

baseline vital signs is prevented by the patient's physical resistance or emotional condition, the reason(s) should be documented .

** Note: Resting vital signs in children :

c. Evaluation of airway patency, to include tonsillar size and anatomic abnormalities that may increase the risk of airway obstruction (e.g., mandibular hypoplasia, large, short neck, limited mandibular range of motion) .

d. Physical abnormalities or conditions that may affect routine intraoperative monitoring (e.g ,.recent orthopedic injuries to arms or legs, active skin rashes.(

e. ASA classification.

****Note: American Society of Anesthesiologists' Physical Status (ASA)**

P1 A normal healthy patient

P2 A patient with mild systemic disease

P3 A patient with severe systemic disease

P4 A patient with severe systemic disease that is a constant threat to life

P5 A moribund patient who is not expected to survive without the operation

P6 A declared brain-dead patient whose organs are being removed for donor purposes

So according to ASA, generally, patients categorized into classes III and IV are better managed in a hospital setting .

Dentists should also assess the degree to which behavioral abnormalities will affect the ability for the child to be assessed during sedation. The child's failure to respond appropriately to verbal interaction places a greater degree of responsibility upon the dentist for determining and maintaining an appropriate level of sedation .

Preoperative dietary instructions :

Dietary instructions should be as follows :

1. No milk or solid foods for 6 hours for children 6 to 36 months old and for 6 to 8 hours for children 36 months and older

2. Clear liquids up to 3 hours before the procedure for children aged 6 months and older.

3. Let everyone in the home know the above information, because siblings or others living in the home often unknowingly feed the child .

Note: Patients with a known history of gastro esophageal reflux or with a high potential for aspiration would benefit from an appropriate increase in fasting duration .

ROUTES OF DRUG ADMINISTRATION

Inhalational Route

Enteral Route

Rectal Route

Intramuscular Route

Submucosal and Subcutaneous Routes

Intravenous Route

Onset of action

Oral 30 min

Inhalation 2-3 min

IM 5 -10 min

IV 20 to 40 seconds

Peak clinical effect

Oral 60min

Inhalation 3 -5

IM 30min

IV 1-10min

Titration

Ability to administer small increments of a drug to achieve a desire clinical effect

Oral Titration not possible

Inhalation Titration posssible

IM Titration not possible

IV Titration posssible

Recovery

Need for an escort (somebody) to leave the office

Oral recovery not complete even after 2-3hrs

Inhalation recovery almost always complete, may dicharged alone

IM not complete need escort

The effects of IV sedation will last for at least 12 hours

Lec -5- DRUGS AND AGENTS USED FOR SEDATION

Dr.Aseel Taha **5th Class**

Hydroxyzine (Atarax, Vistaril) Antihistamine with weak sedative, anticholinergic, and antiemetic properties. In normal doses, it has no cardiovascular or respiratory depressant effects. Absorption through the gastrointestinal tract is relatively rapid, with the onset of action occurring in 15 to 30 minutes. Peak levels occur at 2 hours. Recovery is slow by modern standards, reflected by the half-life of 3 hours. It is available in two forms, hydroxyzine hydrochloride (Atarax and hydroxyzine pamoate (Vistaril). Administration is preferably by the oral route, intramuscular injection must be deep in a large muscle mass. The drug should not be injected subcutaneously or intravenously because of potential tissue necrosis and hemolysis. Preparation: tablets, elixir Dosage: 0.5 to 1.0 mg/kg Also available as IM inj. Img/kg Side effects: prolonged drowsine ataxia, dry mouth. In children, paradoxical reactions may occur at sedative

BENZODIAZEPINE AGONISTS AND ANTAGONISTS: It is a water soluble type of benzodiazepine. The clinical potency of midazolam is estimated be 2 to 5 times the potency of diazepam. Onset of action 3-5 minutes after IV administration and recovery take place in 2-6 hrs. The elimination half-time of midazolam is 1 to 4 hours, which is significantly shorter than that of diazepam. Cognitive testing in adults shows return of normal mental function within 4 hours. Adverse drug reaction Respiratory depression dose, defendant risk of apnea, more often when used with narcotics, Hypotension has also been reported when used in combination. Preparation: syrup, parenteral injection solution.

Note: Flumazenil should be available in the emergency drug kit as it is a direct specific reversal agent used in clinical practice to treat benzodiazepine overdose (reverse sedation)

SEDATIVE-HYPNOTICS

Barbiturate

Can produce all levels of CNS depression, ranging from mild sedation to general anesthesia and deep coma. Their use are of very limited value for pediatric patients

Chloral Hydrate

Chloral hydrate is an aldehyde compound that is metabolized in the liver. It is achemical irritant to the skin and mucous membranes and is associated with a high rate of nausea and vomiting particularly when administered on an empty stomach, so it should be diluted in a flavored vehicle. After oral administration, the drug was characterized by a slow onset time (30 to 60 minutes) and had a duration of action of 4 to 8 hours, with anclimination half-life of 8 to 11 hours.

The drug causes prolonged drowsiness or sleep and respiratory depression. In large dose it produces general anesthesia. Large doses sensitize the myocardium to the effects that resulting in arrhythmias, and thus should be avoided in patients with cardiac disease

The lethal dose of chloral hydrate is stated to be 10 g in adults, yet ingestion of 4 g has been associated with a fatal outcome. With such a wide range of reported toxicity this drug may be an unwise choice for many pediatric patients. It is recommended that young children receive not more than 1 g as a total dose.Chloral hydrate is no longer available commercially in the United

States.Risks are increased when it is accompanied with nitrous oxide, narcotics or local anesthetic agents

Dosage: 25-50 mg/kg to a maximum of 1 g

Supplied: oral capsules 500 mg

Oral solution: 250 and 500 mg/5ml

Rectal suppositories: 324 and 648 mg.

Narcotics

Demerol (Meperidine)

Meperidine. It is water-soluble but is incompatible with many other drugs in solution. Meperidine may be administered through either enteral or parenteral administration,however oral administration is only about half as effective as intramuscular injection.

It is rapidly and well absorbed from the GI tract, reaching peak effect in about 60 minutes. Approximately 90% of an ora**l dose** undergoes biotransformation via first-pass metabolism to normeperidine and meperidinic acid. Normeperidine is an active metabolite with approximately 50% of the analgesic activity as the parent compound, and manifests an elimination half-life of 15 to 40 hours. Normeperidine also possesses CNS stimulation and can become proconvulsant with prolonged accumulation of the metabolite. Its use is contraindicated in patients with a history of hepatic disease, renal disease or dysfunction, or seizure disorders.

Supplied: oral tablets-50 and 100 mg; oral syrup 50 mg parenteral solution-25, 50, 75, and 100 mg/mL event

Dosage: oral, subcutaneous, or intramuscular-1.0 to 2.2 mg/kg, not to exceed 100 mg when given alone or 50 mg when in combination with other CNS depressants.

Note: Overdose or rapid administration can lead to respiratory depression, apnea, rigidity and bradycardia; if these remain untreated, respiratory arrest, circulatory depression or cardiac arrest may occur.

Nitrous oxide N2O

It is the most frequently inhalation agent used in pediatric sedation .Nitrous oxide is a slightly sweet-smelling, colorless, heavier than air, and inert gas. It is compressed in metal cylinders as a liquid that vaporizes on release. The gas is nonflammable but will support combustion. Very potent analgesic but weak anesthetic. It is absorbed quickly from the alveoli of the lungs and is physically dissolved in the blood with no chemical combination anywhere in the body. It is carried in the serum portion of the blood and excreted through the lungs without any biotransformation, small amount may be found in the body fluids and intestinal gas.

OBJECTIVES

The objectives of nitrous oxide sedation, as stated by the American Academy of Pediatric Dentistry, include the following:

-Reducing or eliminating anxiety

- Reducing untoward movement and reaction to dental treatment

-Enhancing communication and patient cooperation

-Raising the pain threshold

•Increasing tolerance for longer appointments

•Aiding in the treatment of a patient with mental and/or physical disabilities or a medically compromised patient

•Reducing gagging

Potentiating the effects of sedatives.

Disadvantages of nitrous oxide-oxygen inhalation may include:

-Lack of potency

-Dependence on psychological reassurance

- Interference of the nasal hood with injection to the anterior maxillary region

- Need for the patient to be able to breathe through the nose

-Nitrous oxide pollution and potential occupational exposure health hazards.

Action (Pharmacodynamics) of N2O

→Create an altered state of awareness without impairment to the motor function and it is a CNS depressant

-Increase the respiratory rate and decrease the tidal volume.

-Cardiac output is decreased and peripheral vascular resistance is increased (important in the cardiac patients)

-Rapid induction and reversal may induce vomiting

-Absorption, metabolism and excretion

Onset: Anywhere from a few seconds up to 3-5 minutes

Crosses the blood-brain barrier rapidly Enter the blood by crossing the pulmonary epithelium and depends upon the concentration gradient.

Elimination

Rapid elimination

Unchanged with exhalation from the lungs so (Do not hold a child close to your face

No significant metabolism by the liver or kidneys

Requirements of the equipment used for the induction of N2O:

1-Should have a continuous flow design with flow meters capable of accurate regulation. Automatic shut down if the O2 level falls < 20%.

Flush level for easy and immediate flushing of the system with 100% O2

4-Can be either mobile units or operating from a central supply to a wall mounted with mobile head.

-5Good and efficient scavenger system.

6-Nasal hood should be of adequate size for adults and children

Types of Inhalation Sedation units

-1Intermittent (demand flow) gases delivered according to the patient, respiratory demand and requirements

-2Continuous flow continuous flow of gases (more safe and accurate

(Components of the continuous flow unit;

-**1**Compressed gas cylinders and pressure gauge.

-2Reducing valve (regulator(

-3Flow meter

-4Reservoir bag

-5Conducting tubing

-6Nasal hoodfull face mask or nasal cann**ula**

Preparation of Patient

Patient in reclined position

•Use TSD

•Describe sensations in advance

Techniques

The acceptance of the nosepiece by the patient is very important in the procedure for effective conscious sedation. If the patient exhibits resistance then this method is not advisable for such a child.

1-Slow induction technique

The bag is filled with 100% oxygen and delivered to the patient for 1 or 2minutes at an appropriate flow ratetypically between 4 and 6 L/min. With an appropriate flow rate movement covering one quarter to one half of the breathing bag should beobserved with each inhalation and exhalation. With too high a flow rate, the bag will be over inflated movement will not be seen with each breath, and leakage will occur from around the mask. In this instance, the flow rate should be adjusted downward. Too low aflow rate will deplete the bag of mixed gases. Once the proper flow rate is achieved the nitrous oxide can be introduced by slowly increasing the concentration in increments of

%10\to 20% until the desired level is achieved.

After stabilization of the nose piece, 100% O2 is delivered for 3-5 minthen N_2O level is increased slowly to 30-35% for 3-5 min (induction period) during this period the dentist should continuously communicates with the child to promote relaxation and reinforce cooperative behavior If the child is older, he can be asked for the physical changes like tingling sensation in the fingers and toes.

The eyes will take a distance gaze with sagging of eyelids, most of the dentists prefer to increase the level of N20 to 50% for 3-5 min to provide the maximum effect for the administration of L.A. Concentration more than 50% is contraindicated in dental practiceafter administration of L.Athe concentration can be brought down to 30-35%.

After the treatment:

Inhalation of 100% O2 for not less than 5 min should be continued to allow diffusion of nitrogen from the venous blood into the alveoli, which will be then exhaled as N2O through the respiratory tract and also allow the patient to return

to the pretreatment activities, with any incident inadequate oxygenation may produce: nausea, headedness or dizziness

The child should be kept in supine position or in his side to maintain air way patencyUpon arriving homethe child should be placed on his side and observed carefully for the first hour and if he wishes to sleephe can be allowed to do so

-2Rapid induction technique

Initiation is done by administration of equal parts of N2O and O2 for 10-15 min , this is followed by maintenance phase where NO is reduced by half for 40 minthe withdrawal is done by administration of O2only which is used to prevent anoxia that may result when N2O is used alone

Common problems associated with N.O

1-Sleep

Patient may go into sleep during the procedure and frequent arousal or communication is required

-2Air way obstruction

Frequent repositioning of the head is needed to hyper extend the mandible so that the tongue is brought forward

-3Vomiting

It could be due to:

Over dose of N_2O

Prolonged administration of N_2O

Pre-existing GIT infection or influenza

History of motion sickness or vomiting (use antiemetic drugs) Impurities during delivery (rare)

This (vomiting) can be prevented by:

(1)Using min. effective concentration

(2)Avoid prolong procedure. (3) Empty stomach inhalation

(4)Slow return to upright position

(5)Aspiration is unlikely

So just ask the patient, to vomit in a chair side emesis basin if there is vomiting

-4Diffusion Hypoxia

Since c has a lower blood solubility, it rapidly diffuse into the alveoli and dilutes the alveoli air causing fall in the partial pressure of the oxygen in the alveoli, to avoid this 100% O_2 for 10 min.

5-Increased N2O concentration

This should be avoided otherwise pressure will be created in the air filled body cavities especially in the middle ear.

6- Hallucinations

This can occur when we give high concentration of N2O dosage of N_2O(>60°)

Chronic Exposure to N_2O

"Long-term (chronic) exposure to nitrous oxide in sufficient concentrations can produce irreversible toxic changes, and should be a concern for dental personnel working in environments in which nitrous oxide is administered to patients"\

Chronic exposure may cause disorders in the of

Respiratory system

Hematological

➤Immunological

Neurological ➤

Kidney

➤Liver

Controlling NO in the operatory:

To minimize the risk of chronic exposure

Good scavenging system

Adequate circulation of the room air

Note:

Chose the proper size of the nasal hood

Limiting of speech and mouth breathing by the patient

Nitrous oxide is not a substitute for the traditional behavior management technique and it should be considered an adjunct to aid in the management of mild to moderate anxious child who is capable to cooperate in the dental chair

General anesthesia)Hospital Based Dentistry:(

The use of general anesthesia for dental care in children is sometimes necessary for safe, efficient, and effective care. All available management techniques, including acceptable restraints and sedation, should be considered before the decision is made to use a general anesthetic. Patients for whom general anesthesia has been

The manegement technique of choice include the following:

1. Patients unable to cooperate due to a lack of psychological or emotional maturity and/or those who have a physical, mental, or medically compromising disability that precludes conscious sedation.

2. Patients with dental restorative or surgical needs for whom local sthesia is ineffective because of acute infection, anatomic variations, or allergy.

3.The extremely uncooperative, fearful, anxious, physically resistant, or uncommunicative child or adolescent with substantial dental needs for whom there is no expectation that the behavior will soon improve.

4.Patients who have sustained extensive orofacia or dental trauma and/or require significant surgical procedures. W

5. Patients requiring immediate, extensive comprehensive oral or dental needs.

6. Patients requiring dental care for whom the use of general anesthesia may protect the developing psyche and/or reduce medical risks.

If the benefits of the procedure outweigh the risk of anesthesia, there are few if any contraindications to general anesthesia. However, when a concern about the medical condition exists, consultation with an anesthesiologist would be desirable. Patients for whom general anesthesia is usually contraindicated include those with a medical contraindication to general anesthesia and healthy and cooperative patients with minimal dental needs.

Advantages Hospital Dentistry:

-1No need for multiple visits

2-treatments can be accomplished in 1 to 1.5 h.

-3Full mouth rehabilitation can be achieved under ideal circumstances.

Disadvantages:

-1Does not help in behavior management.

-2Does not teach the child about dentistry.

-3Risks of G.A.

-4Need to bring own staff and supplies.

-5Need to close office

6- Expensive.

Four stages of anesthesia: 1- Analgesia: Pt. is conscious, reflexes are intact. 2- Delirium 3- Surgical anesthesia 4- Respiratory paralysis

**Pt. unconscious in stage 2, 3 and 4

Ways to minimize the negative effects of G.A. parents:

(1) Involving the child in the operating room tour,

(2) Allowing the child to bring along a favorite doll

(3) Giving pre-induction sedation, or toy. Dentistry

(4) Providing a nonthreatening environment, thorough explanation of the procedure to the parents, mothers receiving G.A. were more stressed.

(5) Giving post-procedure sedation as needed,

(6) Allowing parents to rejoin their children as early as possible in the recovery area.

Requirements of hospital set up for dental treatment:

1- Well-equipped dental unit.
2- Experience, understanding hospital staff.
3- Availability of adequate operating room time and patients beds.
4- Readily available pediatrician. a

5- Close proximity to the dentist's private office

Gingival and periodontal disease in Children

Contents

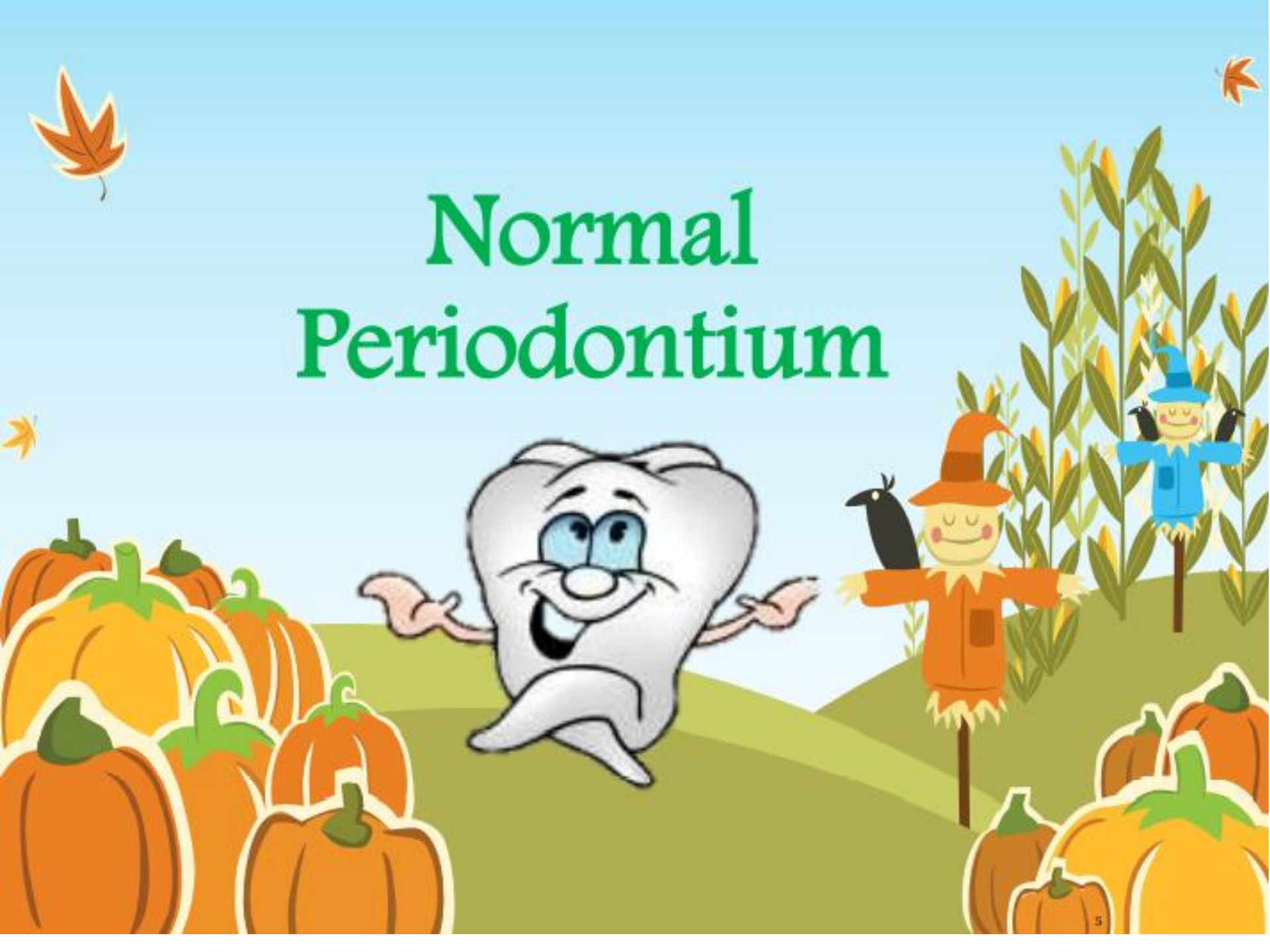
Introduction

- The developing dentition and certain systemic metabolic patterns are peculiar to childhood.
- Periodontal diseases peak their destructive stages in the middle age , but many of them have their inception during childhood.

- There are also gingival and periodontal disturbances that occur more often in childhood and are therefore identified with this period.

- The early detection and early treatment are important from a preventive aspect since, the prevention of most periodontal diseases are relatively simple and very effective, providing lifetime benefits.

Normal Periodontium



- The clinical and radiographic images of gingiva and periodontium in children and adolescent differ from those seen in adults, owing to the significant changes taking place during growth and development.

- The periodontium during childhood and puberty is in constant state of change owing to the exfoliation and eruption of teeth.

- This makes a general description of the normal periodontium difficult because it varies with age of the patient. (Baer and Benjamin, 1974)

Features	Children	Adults
Gingival Colour	More Reddish	Coral Pink
Contour	Free Gingival Margin-rounded	Gingival Margin-Knife Edge
Consistency	Flabby Due To Less CT Density And Lack Of Organized Collagen Fiber Bundles	Firm And Resilient
Surface Texture	Stippling Absent In Infancy. Mostly Seen By Age Of 6yrs	Stippling Present

Features	Children	Adults
Interdental Area	Saddle Shaped Gingiva	Papillary Gingiva
Gingival Sulcus	Newly Erupted Teeth Sulcus Depth Is Greater Than Deciduous Predecessor	1-2mm
Attached Gingiva	Width Increases With Age And Concomitant Decrease In Sulcus Depth	Greater In Adults

GINGIVAL DISEASES

CLASSIFICATION

Eruption Gingivitis

Chronic Nonspecific Gingivitis.

Dental Plaque Induced Gingivitis

Acute gingival disease

- Herpes Simplex Virus Infection.
- Recurrent Aphthous Ulcer
- ANUG
- Acute Candidiasis

Gingival Diseases Modified By Systemic Factors

- Gingival Diseases Associated With The Endocrine System
- Gingival Lesions of Genetic Origin.
- Drugs Induced Gingival Overgrowth.
- Ascorbic Acid Deficiency Gingivitis (Scorbutic Gingivitis)

ERUPTION GINGIVITIS

- A transitory type of gingivitis is often observed in young children when the primary teeth are erupting.
- Often localized and associated with difficult eruption, subsides after the teeth emerge into the oral cavity.

Red and swollen gums are normal for a teething infant. Photo Credit John [illegible]/Stockbyte/Getty Images

- The greatest increase in the incidence of gingivitis in children is often seen in the 6- to 7-year age group when the permanent teeth begin to erupt.

- This inflammation is most commonly associated with the eruption of the first and second permanent molars, and the condition can be painful and can develop into a pericoronitis or a pericoronal abscess.

Cause

This increase in gingivitis apparently occurs because the gingival margin receives no protection from the coronal contour of the tooth during the early stage of active eruption, where Food debris, materia alba, and bacterial plaque often collect around and beneath the free tissue, partially cover the crown of the erupting tooth, and cause the development of an inflammatory process.

TREATMENT

Mild eruption gingivitis requires no treatment other than improved oral hygiene.

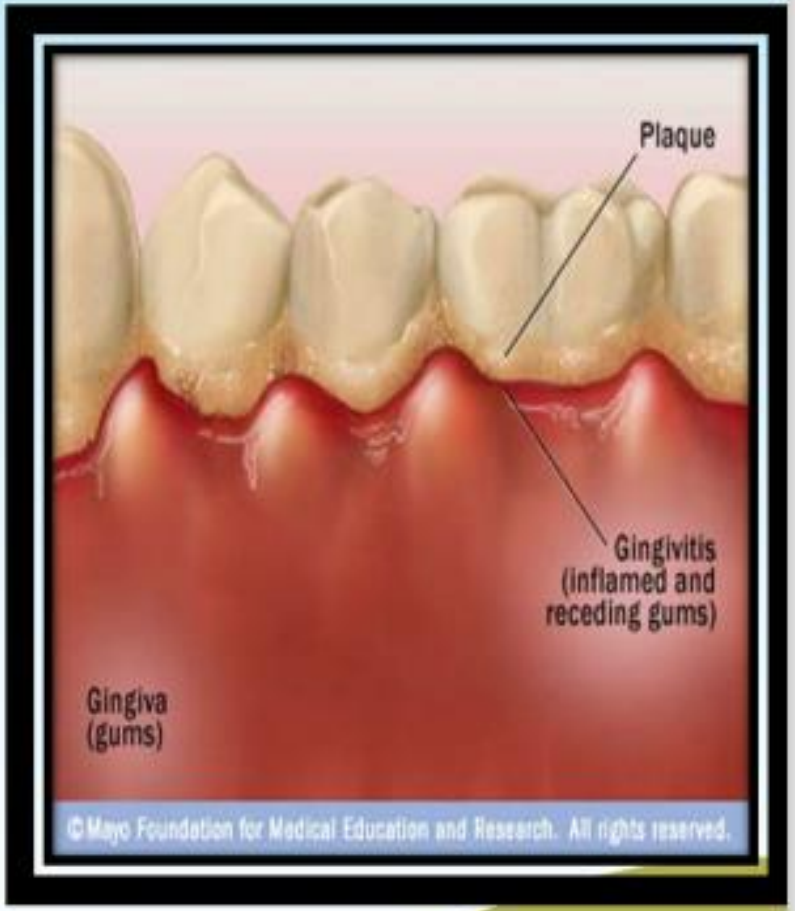
Pericoronitis accompanied by swelling and lymph node involvement should be treated with antibiotic therapy.

Painful pericoronitis may be helped when the area is irrigated with a counterirritant, such as peroxyl.

DENTAL PLAQUE INDUCED GINGIVITIS

- The degree of dental cleanliness and the condition of the gingival tissues in children are related.

- Adequate mouth hygiene and cleanliness of the teeth are related to frequency of brushing and the thoroughness with which bacterial plaque is removed from the teeth



- Gingivitis is generally less severe in children than in adults with similar plaque levels.

- *MATSSON* performed a 21-day experimental gingivitis study comparing 6 children, aged 4 to 5 years, with 6 dental students, aged 23 to 29 years. They found that the children developed gingivitis less readily than the adults.

❖ Gingivitis associated with poor oral hygiene is usually classified as:

- ✓ Early (slight).
- ✓ Moderate.
- ✓ Advanced.

❖ The importance of a good standard of oral cleanliness in reducing gingivitis and, ideally, preventing the progression of the disease in later life.

Treatment

Brushing and bacterial plaque is removed from the teeth.

Favorable occlusion and the chewing of coarse, detergent-type foods, such as raw carrots, celery, and apples, have a beneficial effect on oral cleanliness

Early gingivitis is quickly reversible and can be treated with adequate mouth hygiene and cleanliness of the teeth.

Healthy gingival tissue

ACUTE GINGIVAL DISEASE

HERPES SIMPLEX VIRUS INFECTION

- Herpes virus causes one of the most widespread viral infections.
- The primary infection usually occurs in a child younger than 6 years of age who has had no contact with the type 1 herpes simplex virus (HSV-1) and who therefore has no neutralizing antibodies.
- It is believed that 99% of all primary infections are of the subclinical type.
- The infection may also occur in susceptible adults who have not had a primary infection

- The primary infection may be manifested by acute symptoms (acute herpetic gingivostomatitis). which runs a course of 10 to 14 days.

- The active symptoms of the acute disease can occur in children with clean mouths and healthy oral tissues.

- May be characterized by only one or two mild sores on the oral mucous membranes, which may be of little concern to the child or may go unnoticed by the parents.

The symptoms of the disease develop suddenly and include :

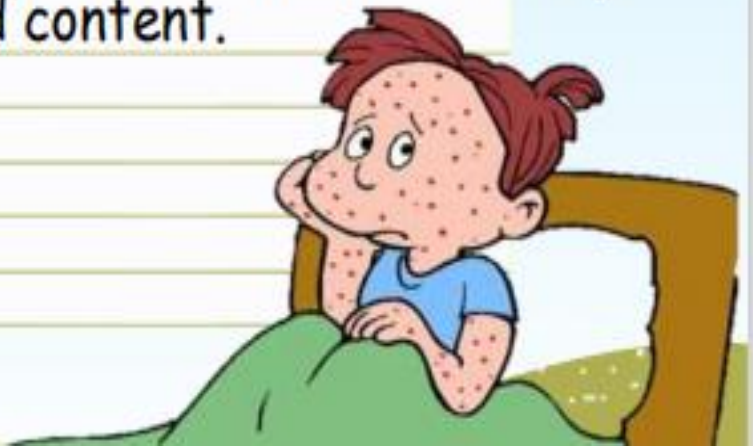
Fiery red gingival tissues.

Malaise.

Irritability.

Headache.

And pain associated with the intake of food and liquids of acid content.



Characteristic oral finding in the acute primary disease

Is the presence of yellow or white liquid-filled vesicles.

In a few days the vesicles rupture and form painful ulcers 1 to 3 mm in diameter .

covered with a whitish gray membrane and have a circumscribed area of inflammation.

The ulcers may be observed on any area of the mucous membrane, including buccal mucosa,tongue, lips, hard and soft palate, and the tonsillar areas.

Large ulcerated lesions may occasionally be observed on the palate or gingival tissues or in the region of the mucobuccal fold.

This distribution makes the differential diagnosis more difficult.

Treatment

Specific antiviral medication as well as provision for the relief of the acute symptoms .

The application of a mild topical anesthetic, such as dyclonine hydrochloride (0.5%) (dyclone), before mealtime temporarily relieves the pain .

Allows the child to take in soft food..

Because fruit juices are usually irritating to the ulcerated area, ingestion of a vitamin supplement during the course of the disease is indicated.

Bed rest .

Recurrent Herpes Labialis (RHL)

- After the initial primary attack during early childhood, the herpes simplex virus becomes inactive and resides in sensory nerve ganglia.

- The virus often reappears later as the familiar cold sore or fever blister, usually on the outside of the lips .

- Approximately 5% of recurrences are intraoral.

The recurrence of the disease has often been related to:

Emotional stress .

Lowered tissue resistance resulting from various types of trauma.

Excessive exposure to sunlight. Use of sun screen can prevent sun-induced recurrences.

Lesions on the lip may also appear after dental treatment and may be related to irritation from rubber dam material or even routine daily procedures.

TREATMENT

Systemic antiviral medications daily dosages are the same as those for the primary infection, but the course of treatment is usually 5 days instead of 10.

Food and drug administration (FDA) in children 12 years and older is valacyclovir 2 g, initially and 2 g 12 hours later.

Topical antiviral agent, penciclovir cream may be applied to perioral lesions but should not be applied to intraoral lesions every 2 hours while awake for 4 days, and it is approved for use in children 12 years of age and older.

Topical 5% acyclovir cream may be prescribed for use five times daily for 4 days in children 12 years of age and older are frequently exposed to HSV-1

RECURRENT APHTHOUS ULCER (CANKER SORE)

Definition :

It is a painful ulceration on the unattached mucous membrane that occurs in school-aged children and adults.

Also referred to as Recurrent aphthous Stomatitis (RAS)

The peak age is between 10 and 19 years of age.

Characterized by :

- Recurrent ulcerations on the moist mucous membranes of the mouth, in which both discrete and confluent lesions form rapidly in certain sites and feature .
- Round to oval crateriform base, raised reddened margins, and pain.

Etological factors

- The cause of RAU is unknown . But it is possible that the lesions are caused by :
- Local and systemic conditions & gastrointestinal disorders.
- Genetic predisposition.
- Immunologic and infectious microbial factors.
- Delayed hypersensitivity to the L form of *streptococcus sanguis*,
- Autoimmune reaction of the oral epithelium.

- Local factors include trauma, allergy to toothpaste constituents (sodium lauryl sulfate), and salivary gland dysfunction Nutritional deficiencies are found in 20% of persons with aphthous ulcers.
- The clinically detectable deficiencies include deficiencies of iron, vitamin B12, and folic acid.
- Stress
- Ship et al also suggested herpes simplex virus, human herpes virus type 6, cytomegalovirus, Epstein-Barr virus, and varicella-zoster virus as possible causes of RAS.

Treatment

- Lesions persist for 4 to 12 days and heal uneventfully, leaving scars only rarely and only in cases of unusually large lesions .
- Current treatment is focused on:

1) Promoting ulcer healing,
2) Reducing ulcer duration and patient pain,
3) Maintaining the patient's nutritional intake,
4) And preventing or reducing the frequency of recurrence of the disease.

- Analgesic medicines and/or systemic immuno-modulating and immunosuppression agents .

Ex : topical corticosteroid (e.G., 0.5% fl uocinonide, 0.025% triamcinolone, 0.5% clobetasol) is applied to the area with a mucosal adherent (e.g., Isobutyl cyanoacrylate, orabase) before meals and before sleeping may also be helpful or four times daily

ACUTE NECROTIZING ULCERATIVE GINGIVITIS (VINCENT INFECTION)

- Rare among preschool children .
- occurs occasionally in children 6 to 12 years old, and is common in young adults.

ANUG can be easily diagnosed because of the involvement of the interproximal papillae and the presence of a pseudomembranous necrotic covering of the marginal tissue

The clinical manifestations of the disease include:

- Inflamed, painful, bleeding gingival tissue,
- Poor appetite,
- Temperature as high as 40°C (104°F),
- General malaise,
- And a fetid odor

Treatment :

The disease responds dramatically within 24 to 48 hours to :

1) subgingival curettage,
2) débridement,
3) use of mild oxidizing solutions.
4) If the gingival tissues are acutely and extensively inflamed when the patient is first seen, antibiotic therapy is indicated.
5) Improved oral hygiene,
6) the use of mild oxidizing mouth rinses after each meal, and twice daily rinsing with chlorhexidine will aid in overcoming the infection.

Distinguishing ANUG From Acute Herpetic Gingivostomatitis

criteria	acute herpetic gingivostomatitis	ANUG
shape	Round ulcers with red areolae on the lips and cheeks	involvement of the interproximal papillae and the presence of a pseudo-membranous necrotic covering of the marginal tissue
Therapeutic(antibiotics) prophylaxis and débridement	not response in the viral infection.	a favorable response in cases of ANUG&reduces the acute symptoms in ANUG.
Age group	most frequently seen in preschool children	Rarely occurs in the preschool-aged group
onset	onset is rapid	develops over a longer period, usually in a mouth in which irritants and poor oral hygiene are present

ACUTE CANDIDIASIS (THRUSH, CANDIDOSIS,MONILIASIS)

- The lesions of the oral disease appear as raised, furry, white patches, which can be removed easily to produce a bleeding underlying surface
- Neonatal candidiasis, contracted during passage through the vagina and erupting clinically during the first 2 weeks of life, is a common occurrence. This infection is also common in immunosuppressed Patients.
- sometimes develop thrush after local antibiotic therapy .

Treatment :

Antifungal antibiotics control thrush.

- For infants and very young children, a suspension of 1 mL (100,000 U) of nystatin (Mycostatin) may be dropped into the mouth for local action four times a day. The drug is nonirritating and nontoxic.
- Clotrimazole suspension (10 mg/mL), 1 to 2 mL applied to affected areas four times daily, is an effective antifungal medication.
- Systemic fluconazole suspension (10 mg/mL) is safe to use in infants at a total dosage of 6 mg/kg or less per day.

CHRONIC NONSPECIFIC GINGIVITIS

- A type of gingivitis commonly seen during the pre-teenage and teenage years .
- May be localized to the anterior region, or it may be more generalized.
- Although the condition is rarely painful, it may persist for long periods without much improvement

CHARACTERIZED BY :

- The fiery red gingival lesion is not accompanied by enlarged interdental labial papillae or closely associated with local irritants.
- The gingivitis showed little improvement after a prophylactic treatment.
- The age of the patients involved and the prevalence of the disease in girls suggested a hormonal imbalance as a possible factor.
- Histologic examination of tissue sections and the use of special stains ruled out a bacterial infection.

Treatment :

- An improved dietary intake of vitamins and the use of multiple-vitamin supplements will improve the gingival condition in many children.
- Improved oral hygiene.

Gingival Diseases Modified By Systemic Factors

- Gingival Diseases Associated With The Endocrine System
- Gingival Lesions of Genetic Origin.
- Drugs Induced Gingival Overgrowth.
- Ascorbic Acid Deficiency Gingivitis (Scorbutic Gingivitis)

GINGIVAL DISEASES ASSOCIATED WITH THE ENDOCRINE SYSTEM

- Puberty gingivitis is a distinctive type of gingivitis that occasionally develops in children in the prepubertal and pubertal period.
- The gingival enlargement was marginal in distribution and, in the presence of local irritants, was characterized by prominent bulbous inter proximal papillae far greater than gingival enlargements

- Associated with local factors.
- Anterior segment and may be present in only one arch.
- The lingual gingival tissue generally remains unaffected .

Treatment

- Improved oral hygiene,
- Removal of all local irritants,
- Restoration of carious teeth,
- Dietary changes necessary to ensure an adequate nutritional status.
- Oral administration of 500 mg of ascorbic acid. However, the improvement did not occur until the vitamin had been taken for approximately 4 weeks.

- Severe cases of hyperplastic gingivitis that do not respond to local or systemic therapy should be treated by gingivoplasty.
- Recurrence of any hyperplastic tissue will be minimal if adequate oral hygiene is maintained.

GINGIVAL LESIONS OF GENETIC ORIGIN

- Hereditary gingival fibromatosis (HGF) .
- This rare type of gingivitis has been referred to as *elephantiasis gingivae* or *hereditary hyperplasia* of the gums
- Is characterized by a slow, progressive, benign enlargement of the gingivae.
- Has an autosomal dominant mode of inheritance.

- ✓The gingival tissues appear normal at birth but begin to enlarge with the eruption of the primary Teeth.
- ✓ the gingival tissues usually continue to enlarge with eruption of the permanent teeth until the tissues essentially cover the clinical crowns of the teeth .
- ✓The dense fibrous tissue often causes displacement of the teeth and malocclusion.
- ✓The condition is not painful until the tissue enlarges to the extent that it partially covers the occlusal surface of the molars and becomes traumatized during mastication

Treatment :

- Surgical removal of the hyperplastic tissue achieves a more favorable oral and facial appearance.
- Hyperplasia can recur within a few months after the surgical procedure and can return to the original condition within a few years.
- importance of excellent plaque control should be stressed to the patient because this delays the recurrence of the gingival overgrowth.

Drugs -INDUCED GINGIVAL OVERGROWTH

Many drugs that have been reported to induce gingival overgrowth in some patients include:

1) Phenytoin (dilantin, or diphenylhydantoin) anticonvulsant.
2) Cyclosporin.
3) Calcium channel blockers
4) Valproic acid.
5) Phenobarbital

PHENYTOIN-INDUCED GINGIVAL OVERGROWTH

- ✓Phenytoin (dilantin, or diphenylhydantoin), a major anticonvulsant agent used in the treatment of epilepsy.
- ✓Side effects of varying degrees of gingival hyperplasia first described by kimball in 1939.
- ✓*Phenytoin-induced gingival overgrowth.*
- ✓An increase in the number of fibroblasts in patients receiving dilantin.

, Begins to appear as :

Early as 2 to 3 weeks after initiation of phenytoin therapy and peaks at 18 to 24 months.

The initial clinical appearance is :

Painless enlargement of the interproximal gingiva.

The buccal and anterior segments are more often affected than the lingual and posterior segments.

The affected areas are isolated at first but can become more generalized later.

Unless secondary infection or infl ammation is present, the gingiva appears pink and firm and does not bleed easily on probing.

As the interdental lobulations grow, clefting becomes apparent at the midline of the tooth.

With time the lobulations coalesce at the midline, forming pseudopockets and covering more of the crown of the tooth.

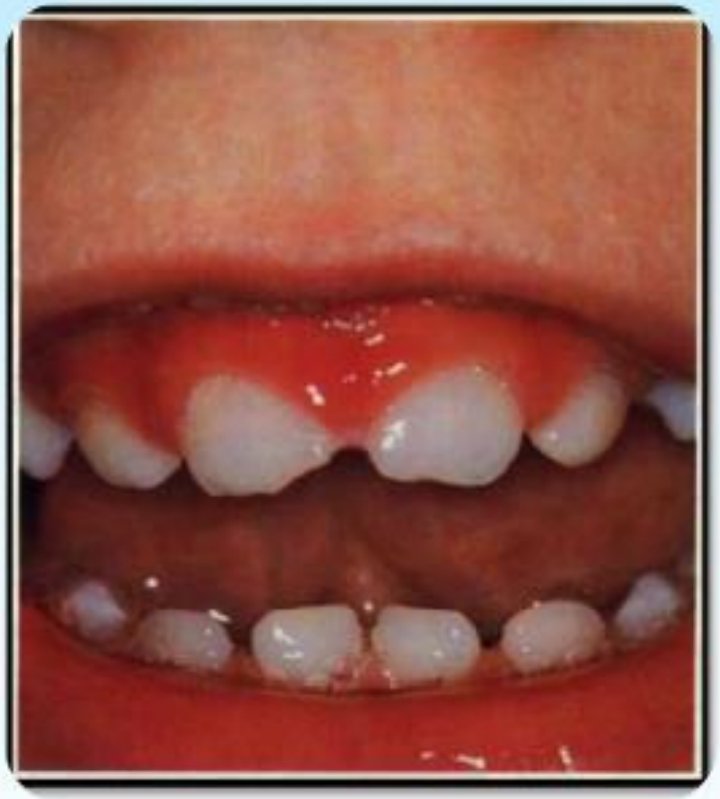
The epithelial attachment level usually remains constant.

In some cases, the entire occlusal surface of the teeth becomes covered.

These lesions may remain purely fibrotic in nature or may be combined with a noticeable inflammatory component

ASCORBIC ACID DEFICIENCY GINGIVITIS (SCORBUTIC GINGIVITIS)

- ✓ Scorbutic gingivitis is associated with vitamin C deficiency and differs from the type of gingivitis related to poor oral hygiene.
- ✓ The involvement is usually limited to the marginal tissues and papillae.
- ✓ The child with scorbutic gingivitis may complain of severe pain, and spontaneous hemorrhage is evident.



- Severe clinical scorbutic gingivitis is rare in children.
- It may occur in children allergic to fruit juices.
- Inflammation and enlargement of the marginal gingival tissue and papillae in the absence of local predisposing factors are possible evidence of scorbutic gingivitis.

Treatment :

Daily administration of 250 to 500 mg of ascorbic acid. Older children and adults may require 1 g of vitamin C for 2 weeks to speed recovery.

CONCLUSION

- ✓Gingivitis is a reversible disease. Therapy is aimed primarily at reduction of etiologic factors to reduce or eliminate inflammation, thereby allowing gingival tissues to heal.
- ✓Complete dental care, improved oral hygiene, and supplementation with vitamin C and other water-soluble vitamins will greatly improve the gingival condition.
- ✓As with all disorders affecting periodontal tissues, maintaining excellent oral hygiene is the primary key to successful therapy.

THANK YOU

Lec **Pediatric Dentistry** **Dr. Aseel Taha**

PERIODONTAL DISEASES IN CHILDREN

Periodontitis, an inflammatory disease of the gingiva and deeper tissues of the periodontium, is characterized by pocket formation and destruction of the supporting alveolar bone. Bone loss in children can be detected in bite-wing radiographs by comparing the height of the alveolar bone to the cemento-enamel junction.

Distances between 2 and 3 mm can be defined as questionable bone loss and distances greater the 3 mm indicate definite bone loss.

- **AGGRESSIVE PERIODONTITIS-**

(EARLY-ONSET PERIODONTITIS (EOP)

EOP: is used as generic term to describe a heterogeneous group of periodontal disease occurring in young individuals who are otherwise healthy.

EOP can be viewed as

1) A localized AGGRESSIVE PERIODONTITIS (LAP)

2) A Generalized AGGRESSIVE PERIODONTITIS (GAP)

Aggressive periodontal diseases were previously known as early onset diseases, namely prepubertal and juvenile periodontitis. A classification system for periodontal diseases and conditions published in 1999 effectively combined these two diseases into one—aggressive periodontitis. This classification removed the arbitrary age limitations that were previously implied by terms such as prepubertal, juvenile, and even adult periodontitis. It is now recognized that aggressive periodontitis can affect the primary and permanent dentitions in both localized and generalized forms

1-Localized aggressive periodontitis (LAP):

LAP is localized attachment loss and alveolar bone loss in an otherwise healthy children and adolescents without clinical evidence of systemic disease. The exact time of onset is unknown, but it appears to arise around or before 4 years of age, when the bone loss is usually seen on radiographs around the primary molars and/or incisors. Abnormal probing depths with minor gingival inflammation, rapid bone loss, and minimal to various amounts of plaque have been demonstrated at the affected sites of the child's dentition. Abnormalities in host defences (e.g., leukocyte chemotaxis), extensive proximal caries facilitating plaque retention and bone loss, and a family history of periodontitis have been associated with LAP in children. As the disease progresses, the child's periodontium shows signs of gingival inflammation, with gingival clefts and localized ulceration of the gingival margin. Clinically, LAP patients have less tissue inflammation and very little supragingival dental plaque or calculus. However, they do present with evidence of subgingival plaque accumulation, both tissue-associated and toothassociated. Progression of bone loss is three to four times faster than in chronic periodontitis. LAP is not thought to be a single disease entity.

2-Generalized aggressive periodontitis (GAP):

The onset of GAP is during or soon after the eruption of the primary teeth. It results in severe gingival inflammation and generalized attachment loss, tooth mobility, and rapid alveolar bone loss with premature exfoliation of the teeth. The gingival tissue may initially demonstrate only minor inflammation with plaque accumulation at a minimum. It often affects the entire dentition. Alveolar bone destruction proceeds rapidly, and the primary teeth may be lost by 3 years of age. Boys were more likely to have GAP than were girls (ratio, 4.3:1) Testing may reveal a high prevalence of leukocyte adherence abnormalities and an impaired host response to bacterial infections

-Affected teeth harbor more nonmotile, facultative, anaerobic, gram negative rods (especially Porphyromonas gingivalis) in GAP than in LAP. Microorganisms predominating in the gingival pockets include Aggregatibacter ctinomycetemcomitans (Aa), Porphyromonas (Bacteroides melaninogenicus, Prevotella intermedia, Capnocytophaga sputigena, and Fusobacterium nucleatum,

-The major periodontal pathogens are transmitted among family members. The past medical history of the child often reveals a history of recurrent infections (e.g., otitis media, skin infections, upper respiratory tract infections).

♣ LAP and GAP are distinctly different radiographically and clinically. Neutrophils in GAP patients have suppressed.

Treatment of aggressive periodontitis:

Successful treatment of aggressive periodontitis depends on early diagnosis, the use of antibiotics against the infecting microorganisms, and the provision of an infection free environment for healing. Treatment of aggressive periodontitis, both LAP and GAP, includes:

- Oral hygiene instructions - Consultation with the patient's physician if necessary.

- Mechanical removal of supragingival and subgingival microbial agents via nonsurgical and/or surgical treatment modalities with adjunctive antimicrobial therapy.

- A combination regimen of amoxicillin and metronidazole over 1 to 2 weeks.

- The use of tetracyclines to treat aggressive periodontitis in children should be avoided because this could cause discoloration of teeth. Likewise, tetracyclines should not be prescribed to pregnant mothers.

****PERIODONTITIS AS A MANIFESTATION OF SYSTEMIC DISEASE**

In 1999 the American Academy of Periodontology introduced a new classification, classifying periodontitis as a manifestation of systemic disease as a separate category.

Several of these conditions are identified in the pediatric population:

A. Associated with hematological disorders

1. Acquired neutropenia

2. Leukemias

B. Associated with genetic disorders

1. Familial and cyclic neutropenia
2. Down syndrome
3. Leukocyte adhesion deficiency syndromes
4. Papillon-Lefèvre syndrome
5. Chédiak-Higashi syndrome
6. Histiocytosis syndromes
7. Glycogen storage disease
8. Infantile genetic agranulocytosis
9. Cohen syndrome
10. Ehlers-Danlos syndrome (types IV and VIII)
11. Hypophosphatasia
12. Other

PAPILLON-LEFÈVRE SYNDROME

This syndrome is characterized by palmar–plantar hyperkeratosis, premature loss of primary and permanent dentitions

Some patients show an increased susceptibility to infection. The syndrome is an autosomal recessive trait with a prevalence of about 1-4 per million of the population. Rapid and progressive periodontal destruction affects the primary dentition with an onset at about 2 years. Exfoliation of all primary teeth is usual before the permanent successors erupt, and patients may be edentulous by the mid to late teens. An extensive family dental history supported by clinical, laboratory, and radiographic examinations confirms the diagnosis.

A case reported in the literature involved observation of Papillon-Lefèvre syndrome in a 2 ½ years old child. Hyperkeratosis of the palms and soles was present; the first evidence was erythema and scaliness noted initially at 8 months of age. The primary teeth erupted at the normal time. However, as early as 2 years of age, the child rubbed

the gingival tissues and acted as if they were painful. There was a tendency toward gingival bleeding when the teeth were brushed. At 2½ years of age, all the primary teeth showed looseness, and fullmouth radiographs revealed severe horizontal bone resorption. Because of gingival inflammation, patient discomfort, and the presence of infected periodontal pockets, all the primary teeth were removed by 3 years of age. Subsequently, complete dentures were constructed 3 months after the removal of the primary teeth. The child tolerated the denture well, both functionally and psychologically.

The first permanent molars and mandibular central incisors erupted at the expected time, and the denture base was adjusted to allow the emergence of the erupting teeth. Although previous reports have indicated that the permanent dentition will also be affected, this child has been followed into young adulthood, and the dentition, including the supporting tissues, appears normal. The reason was owing to the repeated tetracycline antibiotic the patient was taking to treat ear infection between the age of 3 and 6 years. This regimen may have been responsible for eliminating pathogens and preventing the destructive process from being carried into the permanent dentition.

Management:

No treatment is particularly successful. However, Intensive periodontal therapy with specific antibiotic therapy against the causative organisms may be successful in delaying the inevitable exfoliation of teeth. Extraction of any remaining primary teeth before eruption of the permanent teeth has been advocated to provide an edentulous period before permanent teeth eruption. All patients require planned full clearances and dentures to avoid pain and disfigurement. It is important to consider proceeding with extractions soon after the eruption of the permanent dentition to minimize excessive bone loss.

GINGIVAL RECESSION

Gingival recession is often observed in children. Several factors predispose patients to gingival recession. These factors include:

1. The presence of a narrow band of attached or keratinized gingiva
2. Alveolar bony dehiscence
3. Toothbrush trauma

4. Tooth prominence

5. Impinging frenum attachment

6. Soft tissue impingement by opposing occlusion

7. Orthodontic tooth movement

8. Use of impression techniques including subgingival tissue retraction

9. Oral habits

10.Periodontitis, pseudorecession (extrusion of teeth)

11.Intraoral piercings, such as tongue piercings.

Recession is dealt with conservatively by elimination of the etiology if possible, while excellent oral hygiene is maintained in the affected areas. If the recession of the affected area remains unchanged (non-progressive) or improves, continued periodic monitoring is recommended. If the recession has progressed after a 4- to 8-week period of observation, other periodontal procedures may be required based on the identified predisposing factor.

Self-mutilation:

Self-mutilation is a term used to describe the purposeful harm of children to their oral structures. Self-mutilation probably occurs more frequently than is realized because relatively few children will admit to the act unless they are observed practicing it. Therefore the self-inflicted lesions may be incorrectly diagnosed. Dentists should be aware of the possibility of this condition and should approach the problem in the same manner as they do thumb sucking. An attempt should be made to determine the cause. If it is found to be the result of local dental factors, it can be corrected. However, in the majority of children an emotional problem is involved, and the family must be directed to competent counselling services. Children as young as 4 years of age have been observed who have traumatized the free and attached gingival tissues with a fingernail, occasionally to the extent that the supporting alveolar bone has been destroyed. Self-mutilation by biting has been associated with severe emotional disturbances such as congenital insensitivity to pain and autism. Management requires

a choice between the initial uses of protective appliances vs. surgical procedures. Mouthguards are helpful for children with congenital indifference to pain until they are mature enough to appreciate and avoid self-mutilating

ABNORMAL FRENUM ATTACHMENT

A frenum is a membranous fold that joins two parts and restricts the individual movement of each. It is a mucous membrane fold containing epithelium and connective tissue fibers but no muscle.

A normal frenum attaches apically to the free gingival margin so as not to exert a pull on the zone of the attached gingiva, usually terminating at the mucogingival junction. An abnormal or high frenum is present when there is inadequate attached gingiva in the terminal insertion area.

- A frenum attached too closely to the gingival margin (high frenum) may interfere with proper toothbrush placement, may cause opening of the gingival crevice during function, or may interfere with speech. High frenum attachments may also be associated with isolated gingival recessions and diastemas.

- An abnormally short lingual frenum and the inability to extend the tongue constitute a congenital condition known as ankyloglossia (tongue-tie). Normal function can occur with this mild form, and the frenum may lengthen with normal growth and maturation of the child.

- A mandibular anterior frenum occasionally inserts into the free or marginal gingival tissue and causes subsequent recession and pocket formation.

Indications for treating a high frenum include the following:

1. A high frenum attachment associated with an area of persistent gingival inflammation that has not responded to root planing and good oral hygiene

2. A frenum associated with an area of recession that is progressive.

3. A high maxillary frenum and an associated midline diastema that persist after complete eruption of the permanent

4. A mandibular lingual frenum that inhibits the tongue from touching the maxillary central incisors. This would interfere with the child's ability to make /t/, /d/, and /l/ sounds. As long as the child has enough range of motion to raise the tongue to the roof

of the mouth, no surgery would be indicated. Most children cannot normally make these sounds until after 6 or 7 years of age.

FRENOTOMY AND FRENECTOMY

A frenotomy involves an incision of the periosteal fiber attachment and possibly suturing of the frenum to the periosteum at the base of the vestibule. It is associated with less postoperative discomfort than a frenectomy and will usually suffice.

A frenectomy involves complete excision of the frenum and its periosteal attachment. The need for a frenectomy or frenotomy should be based on the individual's ability to maintain gingival health.

EXTRINSIC STAINS AND DEPOSITS ON TEETH

Staining is generally believed to be caused by extrinsic agents, which can be readily removed from tooth surfaces with an abrasive material. The agents responsible for staining are deposited in enamel defects or become attached to the enamel without bringing about a change in its surface.

Pigmentation, in contrast to extrinsic staining, is associated with an active chemical change in the tooth structure, and the resulting pigment cannot be removed without alteration of the tooth structure.

GREEN STAIN

The cause of green stain, which is most often seen on the teeth of children, is unknown, although it is believed to be the result of the action of chromogenic bacteria on the enamel cuticle. It tends to recur even after careful and complete removal. The enamel beneath the stain may be roughened or may have undergone initial demineralization.

ORANGE STAIN

The cause of orange stain is likewise unknown. Orange stain occurs less frequently and is more easily removed than green or brown stain. The stain is most often seen in the gingival third of the tooth and is associated with poor oral hygiene

BLACK STAIN

A black stain occasionally develops on the primary or permanent teeth of children, but it is much less common than the orange or green type.

- A thin black line of dots or band of stain may be seen following the gingival contour.
- It is difficult to remove, especially if it collects in pitted areas.
- Many children who have black stain are relatively free of dental caries and have excellent oral hygiene.

CALCULUS

Calculus is not often seen in preschool children, and even in children of grade-school age, it occurs with much lower frequency than in adult patients.

- A low caries incidence is related to high calculus incidence.
- Children with mental retardation often have accumulations of calculus on their teeth. This accumulation may be related to abnormal muscular function, a soft diet, poor oral hygiene, and stagnation of saliva.
- Supragingival deposits of calculus occur most frequently and in greater quantity on the buccal surfaces of the maxillary molars and the lingual surfaces of the mandibular anterior teeth. These areas are near the openings of the major salivary glands.
- A child that chews mostly on one side partially accounts for the greater cleanliness on that side and cause calculus accumulation.

Lec - Pediatric Dentistry Dr.Aseel Taha

5th class

Dental Management of Handicapped Children

According to the American Academy of Pediatric Dentistry, individuals with special health care needs(SHCN) are those with "any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs." Individuals with SHCN are at increased risk for oral disease.

Children with SHCN may present challenges that require special preparation before the dentist and office staff can provide acceptable care. In addition, parental anxiety concerning the problems associated with a child with SHCN frequently delays dental care until significant oral disease has developed. In addition, some dentists feel uncomfortable providing treatment for children with SHCN, which results in a loss of greatly needed services.

1-FIRST DENTAL VISIT

a- The initial dental examination for a child with SHCN is as that for the initial examination described for normal children.

b- Special attention should be given to obtaining a thorough medical and dental history. The names and addresses of medical or dental personnel who have previously treated the patient are necessary.

c- scheduling the patient at a designated time (early inthe day) and allowing sufficient time to talk with the parents (or the guardian) and the patient before initiating any dental care, a practitioner can establish an excellent relationship with them.

2-RADIOGRAPHIC EXAMINATION

a-Occasionally, assistance from the parent and dental auxiliaries and the use of immobilization devices may be necessary to obtain the films.

b-Better cooperation may be elicited from some children by delaying radiographs until the second visit, when they are familiar with the dental office and have found it a friendly place.

c- For patients with limited ability to control film position, intraoral films with bitewing tabs are used for all bitewing and periapical radiographs. An 18-inch (46cm) length of floss is attached through a hole made in the tab to facilitate retrieval of the film if it falls toward the pharynx.

3- PREVENTIVE DENTISTRY

A-HOME DENTAL CARE

a- Dental education of parents/guardians/caregivers is important to ensure that children with SHCN do not jeopardize their overall health by neglecting their oral health.

b- Reinforcement of good home dental care is provided through mass media (e.g., newspapers, radio, television, and Internet), communication with other people, and school activities (e.g., health classes, parent-teacher association meetings, and observation of National Dental Health Month).

c- . Home dental care should begin in infancy; the dentist should teach the parents to gently cleanse the incisors daily with a soft cloth or an infant toothbrush. For older children who are unwilling or physically unable to cooperate, the dentist should teach the parent or guardian to clean teeth twice a day using correct tooth brushing techniques, safely immobilizing the child when necessary.

Several positions for tooth brushing that permit firm control and support of the child, adequate visibility, and convenient positioning of the adult, with reasonable comfort for both adult and children.

Positions most commonly used for children requiring oral care assistance are as follows:

•The standing or sitting child is placed in front of the adult so that the adult can cradle the child's head with one hand while using the other hand to brush the teeth.

•The child reclines on a sofa or bed with the head angled backward on the parent's lap. Again, the child's head is stabilized with one hand while the teeth are brushed with the other hand.

•The parents face each other with their knees touching. The child's buttocks are placed on one parent's lap, with the child facing that parent while the child's head and shoulders lie on the other parent's knees; this allows the first parent to brush the teeth.

•The extremely difficult patient is isolated in an open area and reclined in the brusher's lap. The patient is then immobilized by an extra attendant while the brusher institutes proper oral care. If a child cannot be adequately immobilized by one person, then both parents and perhaps siblings may be needed to complete the home dental care procedures.

•The standing and resistive child is placed in front of the caregiver so that the adult can wrap his or her legs around the child to support the torso while using the hands to support the head and brush the teeth.

Wrapped tongue blades may be of benefit in helping to keep a child's mouth open while plaque is being removed.

Stabilization of the child's head prevents unnecessary trauma from sudden movements.

B- DIET AND NUTRITION

a- Diet and nutrition influence dental caries by affecting the type and virulence of the microorganisms in dental plaque, the resistance of teeth and supporting structures, and the properties of saliva in the oral cavity.

b- For example, conditions associated with difficulty in swallowing, such as severe cerebral palsy, may require that the patient be on a pureed diet. Patients with certain metabolic disturbances or syndromes, such as phenylketonuria, diabetes, or Prader-Willi syndrome, have diets that restrict specific foods or total caloric consumption. The oral side effects of the child's medications should be reviewed with the parents or guardians at each visit.

C- `FLUORIDE EXPOSURE

Some clinicians treating patients with SHCN who have chronically poor oral hygiene and high decay rates suggest a dailyregimen of rinsing with 0.05% sodium fluoride solution. Nightly application of a 0.4% stannous fluoride or 1.1% sodium fluoride brush-on gel has also been successfully used to decrease caries in children.

D-PREVENTIVE RESTORATIONS

a- Pit-and-fissure sealants have been shown to reduce occlusal caries effectively. Sealants are appropriate in patients with disabilities.

b- For a patient who requires dental work under general anesthesia, deep occlusal pits and fissures should be restored with amalgam or long-wearing composites to prevent further breakdown and decay

c- Patient with interproximal caries need stainless steel crown

E-REGULAR PROFESSIONAL SUPERVISION

Although most patients are seen semiannually for professional prophylaxis, examination, and topical fluoride application, certain patients can benefit from recall examinations every 2, 3, or 4 months.

MANAGEMENT OF A CHILD WITH DISABILITIES

DURING DENTAL TREATMENT

The principles of behavior management are even more important in the treatment of a child with SHCN. Because hospital visits or previous appointments with a physician frequently result in the development of apprehension in the patient,additional time must be spent with the parent and the child to establish rapport and dispel the child's anxiety. If patient cooperation cannot be obtained, the dentist must consider alternatives such as protective stabilization, conscious sedation, or general anesthesia to allow the necessary dental procedures to be performed.

INTELLECTUAL DISABILITY

Intellectual disability is a general term used when an individual's intellectual development is significantly lower than average and his or her ability to adapt to the environment is consequently limited. The condition varies in severity and cause.

DENTAL TREATMENT OF A PERSON WITH INTELLECTUAL DISABILITY

Children with intellectual disability may have a higher incidence of poor oral hygiene, gingivitis, malocclusion, and untreated caries. As the severity of intellectual disability increases, typical oral signs of clenching, bruxism, drooling, pica, trauma, missing teeth, and self-injurious behaviors increase.

Providing dental treatment for a person with intellectual disability requires adjusting to social, intellectual, and emotional delays. A short attention span, restlessness, hyperactivity, and erratic emotional behavior may characterize patients with intellectual disability undergoing dental care. The dentist should assess the degree of intellectual disability by consulting the patient's physician for frequent medical assessment and coordinate care when appropriate.

★ **The following procedures have proved beneficial in establishing dentist-patient parent-staff rapport and reducing the patient's anxiety about dental care:**

1. Give the family a brief tour of the office before attempting treatment. Introduce the patient and family (parent/caretaker/guardian) to the office staff. This will familiarize the patient with the personnel and facility and reduce the patient's fear of the unknown. Allow the patient to bring a favorite item (stuffed animal, blanket, or toy) to hold for the visit.

2. Be repetitive; speak slowly and in simple terms. Make sure explanations are understood by asking the patient if there are any questions. If the individual has an alternative communication system, such as a picture board or electronic device, be sure it is available to assist with dental explanations and instructions.

3. Give only one instruction at a time.

4. Actively listen to the patient. People with intellectual disability often have trouble with communication, and the dentist should be particularly sensitive to gestures and verbal requests.

5. Invite the parent/guardian into the operatory for assistance and to aid in communication with the patient when helpful.

6-Keep appointments short. Gradually progress to more difficult procedures (e.g., anesthesia and restorative dentistry) after the patient has become accustomed to the dental environment.

7. Schedule the patient's visit early in the day, on a lightly scheduled day, when the dentist, the staff, and the patient will be less fatigued.

DOWN SYNDROME (TRISOMY 21 SYNDROME)

Down syndrome is the best-known chromosomal disorder and is caused by the presence of an extra copy of chromosome 21(trisomy 21). Medical conditions that occur more frequently in infants and children with Down syndrome and increase the mortality of these individuals include cardiac defects, leukemia, and upper respiratory infections. The incidence of congenital cardiac defects is about 40%, and because of these patients' high susceptibility to periodontal disease, knowledge of a heart condition is essential for dental treatment. Skeletal findings are an underdeveloped midface, creating a prognathic occlusal relationship.

Oral findings:

Include mouth breathing, open bite, appearance of macroglossia, fissured lips and tongue, angular cheilitis, delayed eruption times, missing and malformed teeth, oligodontia, small roots, microdontia, crowding, and a low level of caries. Children with Down syndrome experience a high incidence of rapid, destructive periodontal disease, which may be related to local factors such as tooth morphology, bruxism, malocclusion, and poor oral hygiene.

Many children with Down syndrome are affectionate and cooperative, and dental procedures can be provided without compromise if the dentist works at a slightly slower pace. Emphasis should be placed on preventive dental care with frequent follow-up visits to monitor oral hygiene. Light sedation and

immobilization may be indicated in those children who are moderately apprehensive. Severely resistive patients may require general anesthesia.

LEARNING DISABILITIES

Learning disabilities are neurological conditions that interfere with the individual's ability to store, process, or produce information. They can affect a person's ability to read, write, count, speak, or reason. Learning disabilities may run in families, indicating a possible genetic factor, and are sometimes confused with intellectual disabilities, autism, deafness, and behavioral disorders.

They include conditions that have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The cause of learning disabilities remains unclear. Physiologic factors, such as minimal brain injury or damage to the central nervouss system, have been implicated. The possibility exists that severe emotional disturbances can develop as a result of learning disabilities. This potential has prompted the early diagnosis and treatment of affected persons. Most children with learning disabilities accept dental care and cause no unusual management problems for the dentist. If a child is resistant, behavioral management and conscious sedation techniques may be used with success.

FRAGILE X SYNDROME

Fragile X is an X-linked developmental disorder.. The defect is an abnormal gene on the terminal portion of the long arm of an X chromosome.Males are more vulnerable because they have only X chromosome and are more significantly affected than females. It is one of the most common genetic causes of learning disability. A history of developmental delay and hyperactivity, and physical features such as prominent ears, long face, and prominent jaw,

flattened nasal bridge, hyperextensible joints, flat feet, mitral valve prolapse (MPV), simian creases of the palms, and postadolescent macroorchidism in males should be considered potential indicators for fragile X syndrome.

Oral Finding

A higher incidence of malocclusions including an open bite and crossbites has been reported. Behavioral features such as hand slapping, hand biting, and poor eye contact are frequently seen. Treatment of children with fragile X syndrome is multidisciplinary, and speech, language, and occupational therapy is required to address the cognitive, language, and sensory integration problems. Medical intervention can be useful in decreasing the hyperactivity and improving the attention span.The mode of dental treatment depends on the level of developmental delay, cognitive ability, and degree of hyperactivity. Children with mild cases may be treated by scheduling short appointments· and using immobilization and/ or conscious sedation. Severely affected individuals must be treated in the operating room under general anesthesia

AUTISM SPECTRUM DISORDER

Autism spectrum disorder (ASD) includes three neurodevelopmental disorders: autism disorder, Asperger syndrome, and pervasive development disorder (PDD). The prevalence is estimated to be 6 per 1000 children. The rise in the rates of ASD has been attributed to increased awareness and better diagnostic tools. It occurs with greater frequency in boys than girls. The exact cause of ASD is not completely known, although genetic factors and environmental factors may play a role. Although the majority of cases are idiopathic, a small percent has a known inheritance such as fragile X syndrome, tuberous sclerosis, Rett syndrome, and Angelman syndrome. Many children with ASD present with a typical developmental period followed by regression in the second year.

There are three levels of impairment noted: The first notable impairment is social, which, in some cases is extreme, with lack of eye contact and not responding to one's name. The second is impairment in communication, which can result in the delay or complete lack of spoken language. Children with Asperger syndrome do not have a general delay in language or cognitive development; however, they often have communication difficulties, especially in sustain conversations. The third area of impairment in ASD is repetitive behaviors. They may include staring, floppy hands, an odd interest in or preoccupation with specific objects. Children with ASD have multiple medical and behavioral problems that may make dental treatment difficult. These children often have poor muscle tone, poor coordination, drooling, a hyperactive knee jerk, and strabismus; 30% eventually develop epilepsy.

Children with ASD may have strict routines and prefer soft foods and sweetened foods. Because of poor tongue coordination, children with ASD tend to "pouch" food instead of swallowing. This habit, combined with the desire for sweetened foods, leads to increased susceptibility to caries. Because of their tendency to adhere to routines, children with ASD may require several dental visits to acclimate to the dental environment. The use of a Papoose Board or Pedi-Wrap and pre appointment conscious sedation may be necessary and in some instances has a calming effect on the child.

CEREBRAL PALSY

Cerebral palsy is one of the primary handicapping conditions of childhood. It is not a specific disease entity but rather a collection of disabling disorders caused by insult and permanent damage to the brain in the prenatal and perinatal periods, during which time the central nervous system is still maturing. This

disability might involve muscle weakness, stiffness, or paralysis, poor balance or irregular gait, and uncoordinated or involuntary movements.

The clinical manifestations of Cerebral palsy depend on the extent and location of damage to the brain. The following are some common manifestations: 1. Intellectual disability. 2. Seizure disorders. 3. Sensory deficits or dysfunctions. 4. Speech disorders. 5. Joint contractures.

No intraoral anomalies are unique to persons with cerebral palsy. However, **several conditions are more common or more severe than in the general population. These conditions are as follows:**

1. Periodontal disease. Periodontal disease and poor oral hygiene occur with great frequency in persons with cerebral palsy. (Patients with cerebral palsy and those who take phenytoin to control seizure activity will generally have a degree of gingival hyperplasia).

2. Dental caries. Increase the incidence of dental caries because of the type of diet, which is usually soft, and contain high carbohydrates.

3. Malocclusions. The prevalence of malocclusions in patients with cerebral palsy is approximately twice that in the general population. Commonly observed conditions include noticeable protrusion of the maxillary anterior teeth, excessive overbite and overjet, open bites, and unilateral crossbites.

4. Bruxism. It is commonly observed in patients with cerebral palsy. Severe occlusal attrition of the primary and permanent dentition may be noted, with the resulting loss of vertical interarch dimension. TMJ disorders may be sequelae of this condition in adult patients.

5. Trauma. Persons with cerebral palsy are more susceptible to trauma, particularly to the maxillary anterior teeth.

The following suggestions are offered to the clinician as being of practical significance in treating a patient with cerebral palsy:

1. Consider treating a patient who uses a wheelchair in the wheelchair

2. If a patient is to be transferred to the dental chair, ask about a preference for the mode of transfer. If the patient has no preference, the two-person lift is recommended.

3. Stabilize the patient's head throughout all phases of dental treatment.

4. Keep the patient's back slightly elevated to minimize difficulties in swallowing. Do not force the limbs into unnatural positions.

5. For control of involuntary jaw movements, choose from a variety of mouth props.

6. To minimize startle reflex reactions, avoid presenting stimuli such as abrupt movements, noises, and lights without forewarning the patient.

7. Introduce intraoral stimuli slowly to avoid eliciting a gag reflex or to make it less severe.

8. Work efficiently and quickly and minimize patient time in the chair to decrease fatigue of the involved muscles.

9. Sedation or general anesthesia may be an option for more complex patients.

Lec - Pediatric Dentistry 5th class
Dr.Aseel Taha

Dental Management of Children with specific condition

1- RESPIRATORY DISEASES ASTHMA

(REACTIVE AIRWAY DISEASE)

Asthma is a common childhood disease, affecting 1 in 10 children. It is a chronic diffuse obstructive airway disease characterized by inflammation, increased mucus production, and bronchial constriction, caused by edema of the mucous membranes, increased mucous secretions, and spasm of smooth muscle.

Before initiating dental treatment, the dentist should know what are the frequency and severity of the attacks, what are the triggering agents, when the patient was hospitalized and/or in the emergency department, when the last attack occurred, what medications the patient takes, and what limitations on activity the patient may have.

Patients taking systemic corticosteroids and those who were hospitalized or in the emergency department in the preceding year should be treated with caution because they are at higher risk of morbidity and mortality. Patients who use bronchodilators should take a dose before their appointment, and they should bring their inhalers or nebulizers into the dental office in case trouble arises.

Behavioral methods are used to reduce anxiety and the child may need to be positioned in an upright position for the dental procedure, and nitrous oxide–oxygen analgesia may be helpful. Hydroxyzine hydrochloride (Vistaril) and diazepam (Valium) have been successful in alleviating anxiety. Barbiturates and narcotics are not indicated because of their potential for histamine release, leading to a bronchospasm. Aspirin compounds and nonsteroidal anti-inflammatory agents are contraindicated because about 4% of patients experience wheezing after taking these drugs.

Oral findings of children with moderate to severe asthma include higher caries rates, decreased salivary rates, increased prevalence of oral

mucosal changes characteristic of chronic mouth breathers, and increased levels of gingivitis. Increased incidence of orofacial abnormalities such as high palatal vault, more posterior crossbites, greater overjets, and increased facial height is also seen.

2- HEARING LOSS

Hearing loss (deafness) is a disability that is often overlooked because it is not obvious. If impairment is severe enough that dentist and child cannot communicate verbally, the dentist must use sight, taste, and touch to communicate and to allow the child to learn about dental experiences. Many times, mild hearing losses are not diagnosed, which leads to management problems because of the child's misunderstanding of instructions; children with more severe hearing losses already have psychological and social disturbances that make dental behavior management more complex

No abnormal dental findings are associated with hearing loss. **The following should be considered in the treatment of a hearing-impaired patient:**

1. Prepare the patient and parent before the first visit.

2. Let the patient and parent determine, during the initial appointment, how the patient desires to communicate (i.e., interpreter, lip reading, sign language, note writing [for child who can read], or a combination of these).

3. Enhance visibility for communication. Watch the patient's expression. Make sure the patient understands what the dental equipment is, what is going to happen, and how it will feel.

4. Reassure the patient with physical contact; hold the patient's hand initially, or place a hand reassuringly on the patient's shoulder while the patient maintains visual contact.

5. Use the tell-show-feel-do approach. Use visual aids and allow the patient to see the instruments, and demonstrate how they work. Hearing-impaired children may be very sensitive to vibration.

6. Display confidence; use smiles and reassuring gestures to build up confidence and reduce anxiety. Allow extra time for all appointments.

7. Avoid blocking the patient's visual field, especially with a rubber dam. 8. Adjust the hearing aid (if the patient has one) before the handpiece is in operation because a hearing aid amplifies all sounds.

9. Make sure the parent or patient understands explanations of diagnosis and treatment.

3- VISUAL IMPAIRMENT

The modalities of listening, touching, tasting, and smelling are extremely important in helping these children learn coping behavior. Hypoplastic teeth and trauma to the anterior teeth have been reported to occur with greater than average frequency in visually impaired children. Such children are also more likely to have gingival inflammation because of their inability to see and remove plaque. Other dental abnormalities occur with the same frequency as in the general population.

Before initiating dental treatment for a visually impaired child, the dentist should keep the following points in mind:

1. Rather than using the tell-show-feel-do approach, invite the patient to touch, taste, or smell, recognizing that these senses are acute. Avoid sight references.

2. Describe in detail the instruments and objects to be placed in the patient's mouth. Demonstrate a rubber cup on the patient's fingernail.

3. Because strong tastes may be rejected, use smaller quantities of dental materials with such characteristics.

4. Some patients may be photophobic. Ask parents about light sensitivity and allow these patients to wear sunglasses.

5. Explain the procedures of oral hygiene and then place the patient's hand over yours as you slowly but deliberately guide the toothbrush.

6. Maintain a relaxed atmosphere. Remember that your patient cannot see your smile.

4-Epilepsy

It is a brain disorder characterized by excessive neuronal discharge that can produce seizures.

Oral Manifestations of Epilepsy

Increased risk for dental caries

Increased risk for oral trauma

Medication-induced gingival hyperplasia,

bleeding gums, and delayed healing.

Behavior Management of Epilepsy

-Take history Ensure medication has been taken as prescribed before treatment to reduce risk of seizure.

-Schedule appointment during time of day when seizures are less likely to occur.

-Children with severe, uncontrolled epilepsy may require general anesthesia for restorative and surgical needs.

-Minimize seizure triggers. Reduce stress and anxiety.

-Keep bright light out of child's eyes or allow child to wear dark glasses.

-Position the patient in as upright a position as possible

-Use low amounts of water and high volume suction to minimize aspiration.

Seizure Management during Treatment

Remove all dental instruments from the mouth. Clear the area around the dental chair. Monitor airway to reduce risk of aspiration. Note time seizure begins: if seizure continues >3 min call EMS

5- HEART DISEASE

Heart disease can be divided into two general types: congenital and acquired. Because individuals with heart disease may require special

precautions during dental treatment, such as antibiotic coverage for prevention of infective endocarditis (IE), a dentist should closely evaluate the medical histories of all patients to ascertain their cardiovascular status.

** Behavior management techniques are useful, and conscious sedation and nitrous oxide–oxygen analgesia have also been proven beneficial in reducing anxiety in such patients. Conscious sedation monitoring and cardiopulmonary resuscitation equipment should be readily available during the appointment. If general anesthesia is indicated, the dental procedures should be completed in a hospital setting, where adequate supportive care is available if needed.

Other considerations are especially important in treating patients who are susceptible to IE:

• Pulp therapy is not recommended for primary teeth with a poor prognosis because of the high incidence of associated chronic infection. Extraction of such teeth with appropriate fixed-space maintenance is preferred.

• Endodontic therapy in the permanent dentition can usually be accomplished successfully if the teeth to be treated are carefully selected and the endodontic therapy is adequately performed.

• A dentist who feels uncomfortable in treating patients who are susceptible to IE has a responsibility to refer them to someone who will adequately care for them.

Conditions at risk of infective Endocarditis during dental care: Prophylactic antibiotic is necessary for invasive dental treatment:

1. Dental procedures likely to induce gingival or mucosal bleeding, including professional cleaning.

2. Surgical operations.

3. Incisions and drainage of infected tissues and endodontic treatment.

4. Intraligmentary injections.

5. Distal shoe space maintainer.

6- HEMOPHILIA (DISORDERS OF HEMOSTASIS)

The hemophilia are disorders of hemostasis, resulting from a deficiency of a clotting factor that promotes formation of a fibrin clot, termed procoagulants. Hemophilia is an inherited bleeding disorder affecting approximately 1in 5000 males.

Hemophilia A, or classic hemophilia, is a deficiency of factor VIII, also known as antihemophilic factor.

Hemophilia B, or Christmas disease which is factor IX (plasma thromboplastin antecedent) deficiency

Hemophilia C or Rosenthal's disease, it is inherited as an autosomal-recessive trait, with male and female offspring equally affected.

Von Willebrand disease (VWD) is a hereditary bleeding disorder resulting from an abnormality of the von Willebrand factor (VWF) found in plasma, platelets, megakaryocytes, and endothelial cells help in formation of plug.

Based on the level of the procoagulant present, hemophilia can be classified into three groups:

•Severe deficiency: levels less than 1%

• Moderate deficiency: levels between 1% and 5%

• Mild deficiency: levels greater than or equal to 5% to less than 50%

**For mild factor VIII deficiency, DDAVP (1-deamino-8-d-arginine vasopressin) may be used for minor hemorrhagic episodes to achieve hemostasis. This drug, when given intravenously, subcutaneously, or intranasally causes a rise in activities of factor VIII and VWF.

USE OF ANTIFIBRINOLYTIC AGENTS

Antifibrinolytic agents are an adjunctive therapy for dental management of patients with bleeding disorders and are important for the prevention or treatment of oral bleeding. These agents include ε-aminocaproic acid (its advantage for children is that it is available in both tablet and liquid form.) and tranexamic acid. Hemophilic patients form loose, friable clots that are easily dislodged or rapidly dissolved,

especially in the oral cavity, where local fibrinolysis is increased. Antifibrinolytics prevent clot lysis within the oral cavity and are often used as an adjunctive therapy to factor concentrates. For some dental procedures in which minimal bleeding is anticipated, antifibrinolytics may be recommended as the sole hemostatic agent. It should not be used when renal or urinary tract bleeding is present or when there is evidence of disseminated intravascular coagulation.

PAIN CONTROL

**Analgesia If patient apprehension is significant, sedation or nitrous oxide–oxygen inhalation analgesia may be considered. Hypnosis has also proved beneficial for some individuals. Intramuscular injections of hypnotic, tranquilizing, or analgesic agents are contraindicated especially in patients who have not received replacement therapy or in patients with inhibitors, due to the risk of hematoma formation.

** Analgesics containing aspirin or anti-inflammatory agents (e.g., ibuprofen) may affect platelet function and should be avoided. Acute pain of moderate intensity is frequently managed with acetaminophen (Tylenol, Temprat). For severe pain, narcotic analgesics may be required and are not contraindicated in the patient with a bleeding disorder.

**Local Anesthesia In the absence of factor replacement, periodontal ligament (PDL) injections may be used. Infiltration anesthesia can generally be administered without pretreatment. However, if the infiltration injection is into loose connective tissue or a highly vascularized area, then factor concentrate replacement to achieve a level of approximately 30% to 40% activity is required (bleeding in pterygomandibular region may result in Asphyxia).

**One must proceed with caution when considering block anesthesia. The loose, connective, non-fibrous and highly vascularized tissue at the sites of inferior alveolar nerve injection and posterior superior alveolar injections is predisposed to development of a dissecting hematoma, which may cause airway obstruction and result in a life-threatening bleeding episode.

The dentist must carefully aspirate to ensure that the needle has not entered a blood vessel. If bloody aspirate is present, further factor

replacement may be required, and the attending hematologist should be notified immediately following the operative procedure.

All patients should be observed for development of a hematoma and immediately referred for treatment in cases where hematomas develop after the administration of local anesthesia.

Dental procedures utilized to treat a patient with a bleeding disorder do not differ significantly from those used for unaffected individuals.

-Conservative Dentistry and Prosthodontic Rubber dam is used to minimize trauma to the tissues

-saliva ejector should be avoided to avoid suction Hematomas.

-Wedges or matrices are used to avoid laceration to the papilla.

- In routine crown preparation retraction is used to expose marginal areas.

-Impression trays are trimmed and edges are coated with soft wax to minimize trauma.

-A rubber dam should be used to isolate the operating field and retract and protect the cheeks, lips, and tongue.

-These soft tissues are highly vascular and accidental laceration may present a difficult management problem.

- The retainer should be placed carefully so that it is stable. If a retainer slips, it may lacerate the gingival papilla. Retainers with subgingival extensions should be avoided. Wedges and matrices can be used conventionally.

- During proximal preparation, the wedge retracts the papilla, thus protecting it. A properly placed matrix should not cause bleeding. High-speed vacuum and saliva ejectors must be used with caution to prevent sublingual hematomas.

- Care must also be used in the placement of intraoral radiographic films, particularly in highly vascular sublingual tissues.

- **A pulpotomy or pulpectomy is preferable to extraction.** Most vital pulpotomy and pulpectomy procedures can be successfully completed

with local infiltration anesthesia. If the pulp of a vital tooth is exposed, an intrapulpal injection may be used safely to control pain. Bleeding from the pulp chamber does not present a significant problem, in that it is readily controlled with pressure from cotton pellets. If pulp tissue is necrotic, local anesthetic is usually unnecessary

- The **extraction** of a tooth in an individual with a bleeding disorder involves more complicated treatment and expense..

- **Primary teeth** when shed in normal way cause little or no hemorrhage, however, if very mobile, extraction may be necessary.

- **Surgical Complications** Despite all precautions, bleeding may occur 3 to 4 days postoperatively when the clot begins to resorb. Both systemic and local treatment should be used for hemostatic control when bleeding occurs. Sufficient replacement factor should be administered to control recurrent bleeding.

7- SICKLE CELL ANEMIA

Sickle cell anemia (SCA) is composed of sickle cell trait, which is benign and does not restrict medical or dental treatment, Patients with SCD produce hemoglobin S instead of the normal hemoglobin A. Hemoglobin S has a decreased oxygen-carrying capacity. Decreased oxygen tension causes sickling of cells. Those patients are susceptible to recurrent acute infections, which result in an “aplastic crisis” caused by decreased red blood cell production and in subsequent joint and abdominal pain with fever. Over time, there is a progressive deterioration of cardiac, pulmonary, and renal function. Patients with SCD have hemoglobin levels of 6 to 9 g/dL (normal, 12 to 18 g/dL).

- Dental appointments should be short to reduce potential stress on the patient.

-The preventive program should have the goal of maintaining excellent oral health and decreasing the possibility of oral infection. Dental treatment should not be initiated during a sickle cell crisis. If emergency treatment is necessary during a crisis, only treatment that will make the patient more comfortable should be provided.

-Patients with SCD may have skeletal changes that make orthodontic treatment beneficial.

-Special care must be taken to avoid tissue irritation, which may induce bacteremias, and the disease process may compromise the proposed treatment.

- The use of local anesthetics with a vasoconstrictor is not contraindicated in patients with SCD. In addition, the use of nitrous oxide is not contraindicated in these patients.

-Care must be taken in treating patients with SCD to avoid diffusion hypoxia at the completion of the dental procedure.

-The restoration of teeth, including pulpotomies, is preferable to extraction. Pulpectomy in a non-vital tooth is reasonable if the practitioner is confident that the tooth can remain non- infected.

- If the tooth is likely to persist as a focus of infection, then extraction is indicated.

-The level of Hemoglobin S should investigated before extraction it should be less than 30%. Poor healing may occur after surgical dental treatment so prophylactic antibiotic may be needed.

-The use of general anesthesia for dental procedures must be approached cautiously in consultation with the hematologist and anesthesiologist.

8- Leukemia

They are hematopoietic malignancies in which abnormal leukocytes (blast cells) proliferate in the bone marrow, replacing normal cells, and disseminate into the peripheral blood, accumulating in other tissues and organs of the body. Leukemia is classified according to the morphology of the predominant abnormal leukocytes in the bone marrow. These types are further categorized as acute or chronic, depending on the clinical course and the degree of differentiation, or maturation, of the predominant abnormal cells.

ORAL MANIFESTATIONS OF LEUKEMIA

Abnormalities in or around the oral cavity occur in all types of leukemia and in all age groups. However, oral pathologies are more commonly observed in acute leukemia than in chronic leukemia. The most frequently reported oral abnormalities attributed to the leukemic process include:

1-Regional lymphadenopathy.

2. Mucous membrane petechiae and ecchymosis,

3. Gingival bleeding, gingival hypertrophy. Pallor, and nonspecific ulcerations**.**

Manifestations seen occasionally are:

**The propensity for gingival bleeding is greatly increased in persons with deficient oral hygiene because accumulated plaque and debris are significant local irritants. Direct invasion of tissue by an infiltrate of leukemic cells can produce gingival hypertrophy. Such gingival changes can occur despite excellent oral hygiene.

**Infiltration of leukemic cells along vascular channels can result in strangulation of pulpal tissue and spontaneous abscess formation because of infection or focal areas of liquefaction necrosis in the dental pulp of clinically and radiographically sound teeth. Evidence of skeletal lesions is visible on dental radiographs in up to 63% of children with acute leukemia. Manifestations in the jaws include generalized loss of trabeculation, destruction of the crypts of developing teeth, loss of lamina dura, widening of the PDL space, and displacement of teeth and tooth buds.

Because none of the oral changes is a pathognomonic sign of leukemia and all can be associated with numerous local or systemic disease processes, a diagnosis of leukemia cannot be based on oral findings alone. Such changes should be, however, alert the clinician to the possibility of malignancy as the underlying cause.

**Candidiasis is common in children with leukemia. They are especially susceptible to this fungal infection because of: (1) General physical debilitation, (2) Immunosuppression, (3) Prolonged antibiotic therapy, (4) Chemotherapy, (5) Poor oral hygiene.

DENTAL MANAGEMENT OF PATIENTS WITH LEUKEMIA

Before any dental treatment is administered to a child with leukemia, the child's hematologist/oncologist or primary care physician should be consulted. The following information should be ascertained:

1. Primary medical diagnosis

2. Anticipated clinical course and prognosis

3. Present and future therapeutic modalities

4. Present general state of health

5. Present hematologic status

For a child whose first remission has not yet been attained or one who is in relapse, all elective dental procedures should be deferred. However, it is essential that potential sources of systemic infection within the oral cavity be controlled or eradicated whenever they are recognized (e.g., immediate extraction of carious primary teeth with pulpal involvement).

Routine preventive, restorative, and surgical procedures can usually be provided for a patient who is in complete remission yet is undergoing chemotherapy. The time when such procedures may be completed without complications will depend on the specific agents administered and the time of administration.

❖ Before the appointment—preferably the same day—a blood cell profile (complete blood count) and platelet count should be obtained

❖ Pulp therapy on primary teeth is contraindicated in any patient with a history of leukemia.

❖ Endodontic treatment for permanent teeth is not recommended for any patient with leukemia who may have a chronic, intermittent suppression of granulocytes. Even with the most exacting technique, an area of chronic inflammatory tissue may remain in the periapical region of

endodontically treated teeth. An area of low-grade, chronic inflammation in a healthy patient is generally well tolerated, but in an immunosuppressed, neutropenic patient the same area can act as an anachoretic focus with devastating sequelae.

❖ A platelet level of 100,000/mm3 is adequate for most dental procedures

❖ Routine preventive and restorative treatment, including non-block injections, may be considered when the platelet count is at least 50,000/mm3.

❖ If the platelet count is lower than 20,000/mm3, all the intraoral mucosal tissues may show clinical evidence of spontaneous hemorrhaging (e.g., petechiae, ecchymosis, or frank hemorrhage). No dental treatment should be performed at such a time without a preceding prophylactic platelet transfusion. Good oral hygiene must be maintained while the platelet count is at this level, but it may be necessary to discontinue the use of a toothbrush and to substitute cleaning with moist gauze wipes, supplemented by frequent saline rinses.

❖ The use of a soft nylon toothbrush for the removal of plaque is recommended. Infection and hemorrhage are the primary causes of death other than resistant disease or relapse in children with leukemia.

Therefore the primary objective of dental treatment in a child with leukemia should be the prevention, control, and eradication of oral inflammation, hemorrhage, and infection. It is important that significant local irritants, includding orthodontic appliances, be removed. Scaling and subgingival curettage should not necessarily be perceived as elective dental treatment in all patients. This is especially true if the anticipated clinical course may place the patient at high risk for hemorrhage and infection. Patients with classic leukemic gingivitis experience various degrees of discomfort. The use of warm saline rinses several times each day may assist in the relief of symptoms. Erosive or ulcerative lesions are common in children with leukemia. These lesions are often associated with the use of certain chemotherapeutic agents.

9-Renal disease

In renal disorders there is increased susceptibility to: Infection and immunosuppression, bleeding tendency, decreased ability to excrete drugs, existence of A-V shunt, cross infection.

Manifestations of Renal Disease and Dialysis:

Enlarged (asymptomatic) salivary glands i.e. Parotitis

Decreased salivary flow, Xerostomia Dry mouth

Odor of urea on breathe, ammonia like taste and smell

Metallic taste

Increased calculus formation

Low caries rate

Enamel hypoplasia

Extrinsic (secondary to liquid ferrous sulfate therapy),

dark brown stains on crowns Intrinsic (secondary to tetracycline staining)

Note: Chronic renal failure is the irreversible deterioration in renal function which results from a diminished mass of the excretory, metabolic and endocrine functions of the kidney which leads to the development of the clinical syndrome of uremia, so:

UNDER CONSERVATIVE CARE

• Consultation with patient's physician

• Check lab values, blood urea nitrogen (do not treat if less than 60 mg/100ml) and serum creatinine (do not treat if less than1.5 mg/100ml).

• Avoid dental treatment if the disease is unstable.

• Monitor blood pressure closely

• Pay meticulous attention to good surgical technique

• Avoid nephrotoxic drugs • Adjust doses of drugs metabolized by the kidney

• If medical parameters permit: Try to eliminate all foci of infection Keep only the easily maintainable teeth Insist on keeping a good oral hygiene

• If patient is in advance stages, dental care may best be provided after physician's consultation and in a hospital like setting

• Because of the potential bleeding problems:

1. Pretreatment screening for bleeding time and platelet count PTT, PT, platelet count.

2. A hematocrit level and hemoglobin count should be obtained to assess the status of anemia.

• If an orofacial infection exists, aggressive management is necessary using culture and sensitive tests and appropriate antibiotics. Consider corticosteroid supplementation as indicated.

NEPHROTOXIC DRUGS: Tetracyclines Streptomycin Vancomycin Gentamycin Acyclovir Acetaminophen Phenacetine NSAIDs Asprin Antihistamines, Phenobarbitones So you should give: Cloxacillin, erythromycin, minocycline, codiene, diazepam, lidocaine. \

PATIENT RECEIVING DIALYSIS

Those patients at high incidence of serum hepatitis, high incidence of anemia, significant incidence of secondary hyperparathyroidism, uremic stomatitis may exist, may undergo heparinization during hemodialysis, and may have arteriovenous shunt or fistula. So keep in mind:

• The work will be the same as conservative care conditions

• Beware of concerns of arteriovenous shunt

• Consult with the physician about risk for infective endocarditis

• Avoid blood pressure cuff and IV medications in arm with shunt

• Avoid dental care on day of treatment; best to treat on day after

• Consider antimicrobial prophylaxis

• Consider corticosteroid supplementation as indicated

• Assess status of liver function and presence of opportunistic infection in those patients because of increased risk for carrier state of hepatitis B and C viruses and human immunodeficiency virus.

Dental management

1-Screen for HBsAg and HBsAb

2-Antibiotic prophylaxis to prevent endarteritis of arteriovenous fistula

3-Prevent hypoxia

4-Provide treatment on the day after hemodialysis

5-Be careful to protect the fistula or shunt when patient on dental chair

6-Refer the patient to physician if uremic stomatitis is noted to develop

Renal transplant patient

Infection in such patients is life –threatening. Before transplantation only maintained teeth should be determined by dental team approach, however, teeth with furcation involvement, periodontal abscesses, or extensive surgical requirements should be extracted.

Dental management

1- Emergency treatment only for 1st 6 months

2- HBs Ag screening

3-Prophylactic antibiotics according to AHA recommendations

4- Erythromycin is contraindicated in patients on cyclosporins

5- Immunosuppressed patients requires supplemental corticosteroids