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RESEARCH ARTICLE

SPECIAL CARE DENTISTRY FOR DEVELOPMENTALLY DISABLED CHILD

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Abstract

Special Care Dentistry (SCD) is a discipline focused on enhancing oral health for individuals with diverse impairments, including physical, sensory, intellectual, and medical conditions. It highlights the significant prevalence of disabilities in India and globally, as well as the complex nature of disability according to the WHO International Classification of Functioning. It discusses the extended lifespan of Children with Special Healthcare Needs (CSHCN) due to medical advancements, which necessitates tailored dental care to manage associated oral health challenges. Despite global efforts to improve oral health, disadvantaged and disabled populations continue to face disparities. It concludes by outlining the scope of a forthcoming library dissertation, which aims to review prevalent oral conditions among individuals with special needs and propose general care recommendations to address their unique challenges in accessing dental treatment.

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Introduction:-

Special Care Dentistry is concerned with providing and enabling the delivery of oral care to people with impairment or disability.

“Disabled” does not mean worthless... it’s never about productivity, it is about humanity—Crane (998)¹.

The maintenance of general and oral health of such children is difficult and their dentition may be ravaged by caries and periodontal disease. Hence, the management of these “God’s forgotten children” is a task which needs special effort on the part of the dental surgeon and paediatric dentist¹. The number of children with disabilities is rising due to improvements in medical technology and treatment. Medical advances have facilitated the survival of children who previously would have passed away, which sometimes means survival with a disability. Also, children with complex disabilities are able to live much longer thanks to modern medicine. As with all children, providing dental care to this population requires that dental providers take a holistic view of the child and family, not just the teeth. Children with special needs, like all children, are all unique in their personalities, interests, family situation, strengths, and challenges. Each has a diagnosis, which provides clues about medical, dental, and behavioural management; however, the reality is that every patient is an individual. One child with autism or cerebral palsy may have needs that are entirely different from another child with the same diagnosis. It is a joy, privilege, and challenge to discover each child and develop an individual approach to deliver dental care that promotes a lifetime of oral health². Thus, aim of this library dissertation to discuss the factors and the technique to manage special child in dental operatory.

Special Care Dentistry

The improvement of oral health of individuals and groups in society who have a physical, sensory, intellectual, mental, medical, emotional or social impairment or disability or, more often, a combination of a number of these factors.³

According to **American Association of Paediatric Dentistry (2013)**⁴ defines special health care needs as “any physical, developmental, mental, sensory behavioural, cognitive or emotional impairment or limiting condition that requires medical management, health care intervention and/or use of specialized services or programs.”

Impairment

It is defined as any loss or abnormality of psychological, physiological or anatomical structure or function, e.g., Loss of vision, Loss of hearing, etc. Primary impairment may lead to secondary impairment e.g., Defective hearing results in learning difficulties and poor school performance.

Impairment leads to Disability.

Disability

According to **Centres for Disease Control and Prevention (2018)**⁵ Developmental disabilities defined as a group of conditions due to an impairment in physical, learning, language, or behavior areas. These conditions begin during the developmental period, may impact day-to-day functioning, and usually last throughout a person’s lifetime.

Handicapped Or Challenged

According to **World Health Organization (1980)**⁴ defines a handicapped individual as “one who, over an appreciable time, is prevented by a physical or mental condition from full participation in the normal activities of his age group, including those of a social, recreational education and vocational nature.”

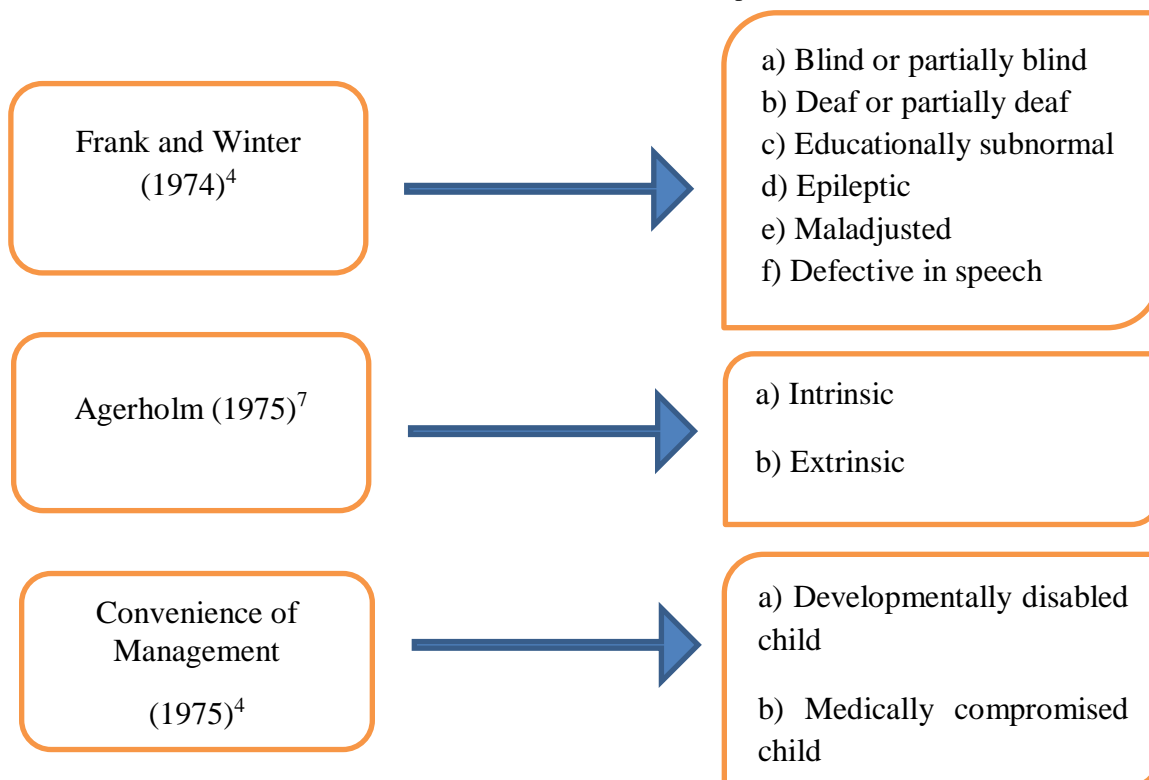
Children With Special Healthcare Needs (CSHCN)⁶

According to **American Academy of Paediatric Dentistry** is an age-defined specialty that provides both primary and comprehensive preventive and therapeutic oral health care for infants and children through adolescence, including those with special health care needs.

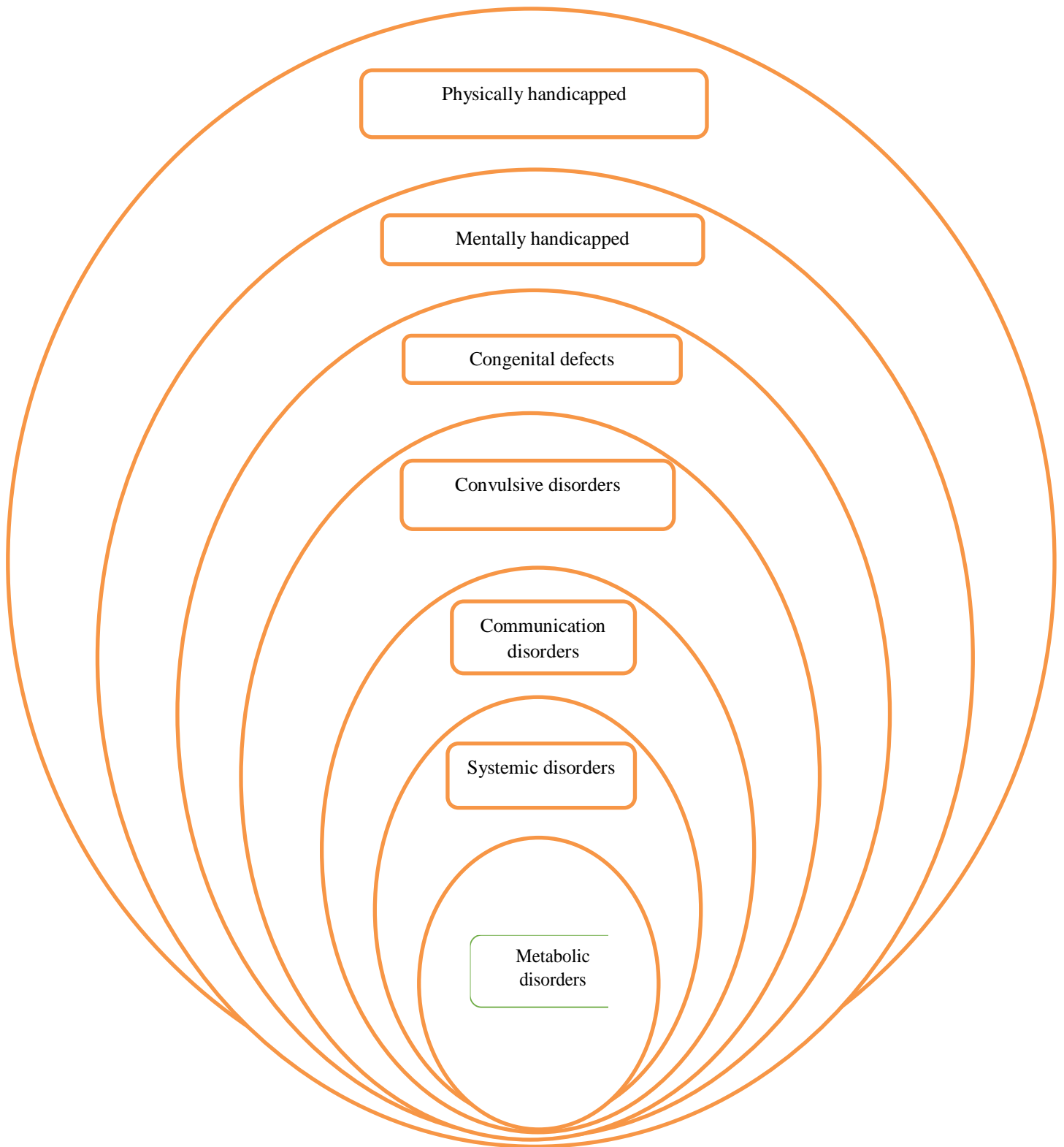
Classification

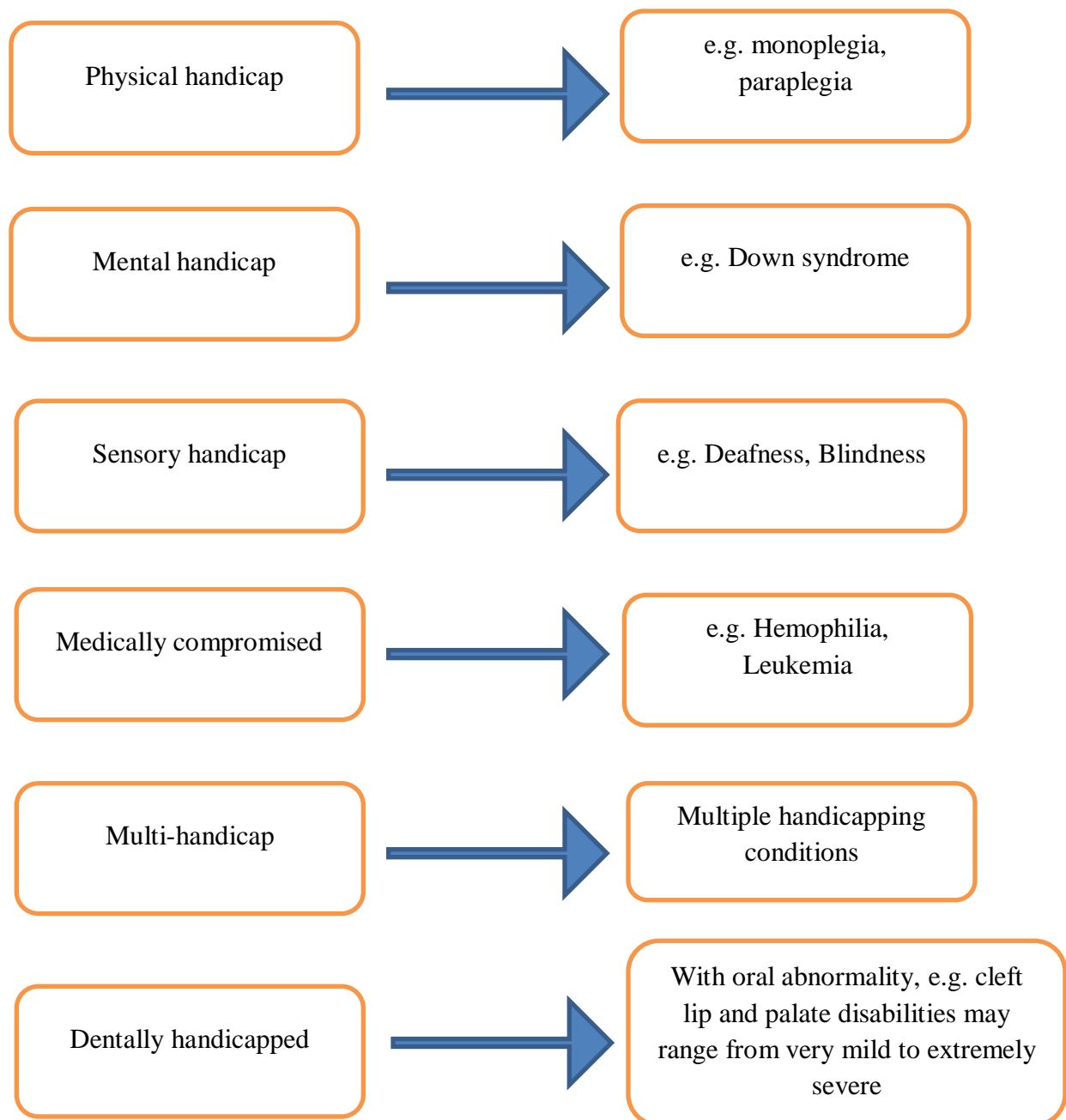
The special child has been classified in various categories according to different author which has listed below:

Flowchart:- Classification of Special Child.



Nowak (1976)⁴



Damle (2000)¹

Flowchart:- Classification of Special Child According to Damle.

The Ethos of Special Care Dentistry³

The ethos of Special Care Dentistry is its broad-based philosophy of provision of care. It achieves the greatest benefit for patients by taking a holistic view of oral health, and liaising and working with all those members of an individual's care team (be they dental, medical or social) to achieve the most appropriate care plan and treatment for that person through an integrated care pathway. Special Care Dentistry is proactive to the needs of people with disabilities rather than solely reactive. Recognising that some groups of people are unable to access oral healthcare unaided, to express a desire or need for oral healthcare or includes screening, preventive, and treatment programmes tailored to meet the specific needs of groups or individuals.

Its guiding principles are that:

1. All individuals have a right to equal standards of health and care.
2. All individuals have a right to autonomy, as far as possible, in relation to decisions made about them.
3. Good oral health has positive benefits for health, dignity and self-esteem, social integration, and general nutrition and the impact of poor oral health can be profound.

Goals

Whilst perfect oral health is the ideal goal, five important objectives when providing oral health care are:

1. Enabling patients to care for their own oral health, with or without assistance
2. Keeping patients free from pain and acute disease
3. Maintaining effective oral function
4. Retaining aesthetics
5. Causing no harm.

Common Oral Health Problems And Management In Special Needs Care Children

1. Trauma
2. Tooth wear
3. Bruxism⁸
4. Caries
5. Erosion
6. Periodontal disease
7. Drooling
8. Dry mouth
9. Mucosal disease
10. Biting
11. Oral Candidiasis
12. Halitosis

Oral Health Care for Special Child⁸

Provision of oral health care for individuals with special needs involves not only the delivery of safe and appropriate dental care but also focuses on the need to improve the oral health status of these populations by employing effective preventive measures. These objectives can be facilitated by the development of clinical guidelines and integrated care pathways to help overcome barriers to oral health care.

A) Barriers To Oral Health Care

The barriers to oral health care for people with special needs can be classified by illustrating the role of the dental profession and its interaction with individuals and society and government, as follows:

1. Barriers with reference to the individual

1. Lack of perceived need
2. Anxiety or fear, which may be heightened by previous dental or medical encounters
3. Financial considerations
4. Lack of access

2. Barriers with reference to the dental profession

1. Inappropriate manpower resources
2. Uneven geographical distribution
3. Training inappropriate to changing needs and demands

4. Insufficient sensitivity to patient attitudes and needs. Barriers with reference to society
5. Insufficient public support of attitudes conducive to health
6. Inadequate oral health care facilities
7. Inadequate oral health manpower planning
8. Insufficient support for research.

3. Barriers with reference to government

1. Lack of political will
2. Inadequate resources
3. Low priority.

B) General Consideration for The Treatment of Special Child in Dental Office

1. Dental Office Access
2. Behaviour Management
3. Dental Radiograph
4. Special Modification for Invasive Dental Procedures
5. Consideration For Sedation

Developmental Disability⁹

It is a severe, long-term disability that can affect cognitive ability, physical functioning or both. These disabilities appear before age 22 and are likely to be life-long. The term 'developmental disability' encompasses intellectual disability, but also includes physical disabilities.

Intellectual disability

As a general term is applied to persons whose intellectual development is significantly lower than that of normal people and whose ability to adapt to their environment is consequently limited (McDonald, 1983)⁹.

Intellectual disability¹⁰

Is defined by the American Academy of intellectual disability as "a disability characterized by significant limitations both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behavior which covers a range of day-to-day social and practical skills".

Most common developmental disabilities which are encountered in paediatric dental clinic are:

1. Mental Retardation
2. Down Syndrome
3. Epilepsy
4. Cerebral Palsy
5. Autism
6. Visual Impairment
7. Hearing Impairment

Mental Retardation

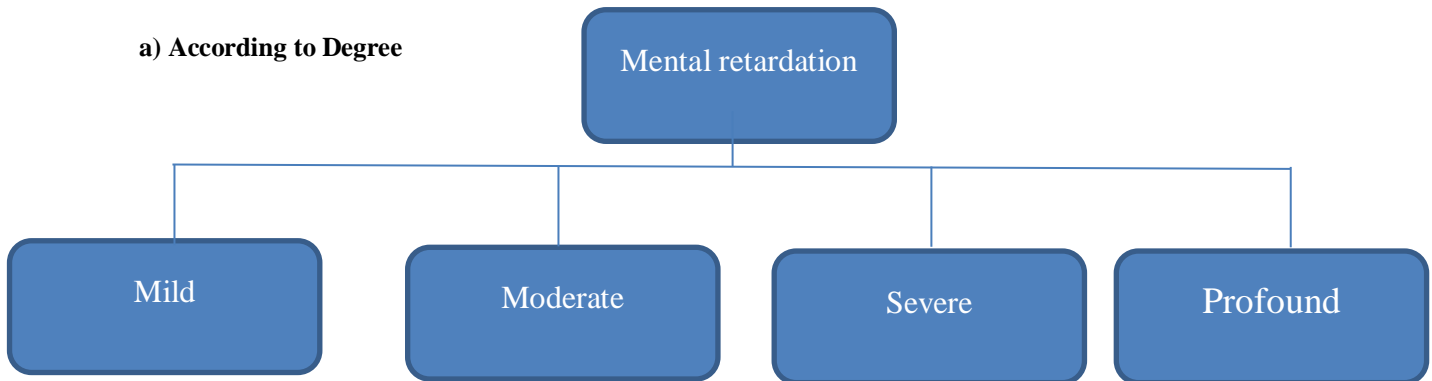
Introduction

Mental retardation (MR) is one of the most common developmental disabilities. It is a source of pain and bewilderment to many families. Sheerenberger (1983) classifies that disability of brain and mind occurs due to brain damage. MR can be defined by a collection of symptoms, traits or characteristics. It has been renamed many times throughout the history. This is not a disease, nor should it be confused with mental illness. One of the major differences is that they are slow learners, thus these kids do not grow at an average rate and exhibit great difficulty in learning and productivity⁴⁶.

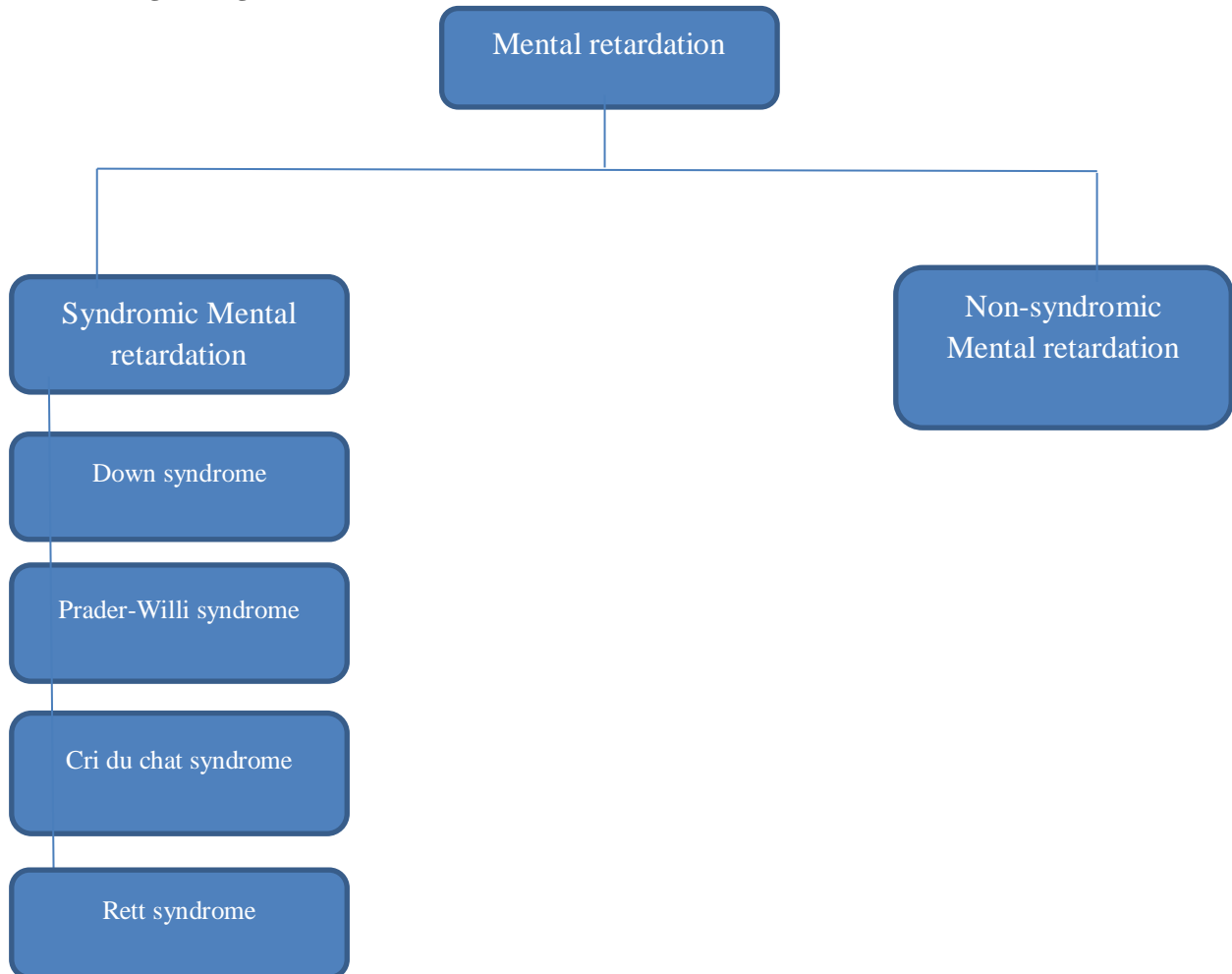
Mental retardation is defined as an overall intelligence quotient lower than 70, associated with functional deficit in adaptive behavior, such as daily-living skills, social skills, and communication⁴.

Classifications¹

a) According to Degree



b) According to Origin



Flowchart:- Classification of Mental Retardation.

Table:- According IQ score.

Classification	IQ Score
MILD MR	55-70
MODERATE MR	40-54
SEVERE MR	25-39
PROFOUND MR	Below 25

Clinical Manifestations

The clinical features of MR are summarised in table 3 according to different levels.⁴

1. Tensely reclined head, abnormal behavior, and poor mobility
2. Retained primitive reflexes and delayed milestones
3. Increased tone in limbs and persistent fisting
4. As the child grows, a typical clinical picture of abnormal body movement establishes.
5. Aspiration is common manifestation in children with neuromuscular disorders and may cause bronchitis, pneumonia and even death from respiratory infection.
6. Poor verbal skills may be due to communicating discomfort related to gastroesophageal reflux disease that may cause sore cough, throat choking due to regurgitation of acidic content into the oral cavity.
7. Constipation and faecal impaction are common in MR patient and may lead to discomfort.
8. Menstrual discomfort is also a source of agitation and aggression that includes self-injurious behavior. In case of uncontrolled dysmenorrhea, surgery may be a reasonable option.
9. Seizures are likely to be severe, occur often and difficult to control, along with self-injurious behavior.
10. Neuromuscular scoliosis is common finding with MR in particular with cerebral palsy.
11. Neuropsychiatric disorders such as obsessive-compulsive disorder, attention-deficit/hyperactivity disorder, and mood disorders are found to be associated with MR.
12. MR patients are poor predictors of pain due to delayed responses, leading to delayed diagnosis and increased morbidity.

Oral Manifestations⁴

1. Advanced cases of baby-bottle tooth decay/early childhood caries, and prescription-medication-induced dental decay.
2. Altered salivary flow and tooth decay, “placating” tooth decay, malocclusions, fractured and nonvital teeth, soft tissue complications, and bruxism rates of dental decay
3. Major loss of tooth structure, leading to an eventual extraction, can affect developing speech patterns
4. Unmonitored food consumption: Loss of space maintenance for the permanent dentition causing significant malocclusion problems, abnormal jaw development, marked alterations in mastication, and poor aesthetics
5. Poor dental hygiene, dental plaque and gingivitis, calculus in early ages, intense halitosis due to food remnants in teeth and mucosal, and cariogenic and soft diet.
6. Gingival overgrowth because of hydantoin, chronic infections and inflammation, systematic tooth extraction instead of conservative treatments, use of prosthesis because potential risks, bad occlusion, traumatic occlusion and bruxism, with dental abrasion, and hypersensitivity

Treatment consideration for mental retardation**1. Dental management**

1. Proper Medical History
2. The medical status of the patient
3. Any medication the patient is currently taking and need to adjust dosage
4. before dental treatment.
5. Need of antibiotic prophylaxis for Sub-acute bacterial endocarditis. – Any
6. other precautions (such as choice of local anesthesia or sedation drug) for dental treatment.
7. Dental History
8. Behavioral History

2. Behavioral Strategies

1. Avoiding/minimizing painful/fear-evoking stimuli
2. Reinforcement of appropriate response

3. Systematic desensitization
4. Promoting relaxation using pre-medication.
5. Brief and early morning appointments are suitable
6. Get the patient familiar with the dentist, dental staff and dental office before the treatment begins.
7. Many of these patients utilize wheelchair for transportation, therefore, it is important to have a ramp access to your clinic/hospital.

3. Management Aids

1. Papoose board for complete patient restraint
2. Tie type arm and leg restraints
3. Seat belt type straps
4. Extra personnel.
5. Intra-oral management aids such as Molt's mouth prop
6. Tapped multiple tongue blades

4. Radiographic Examination

1. Should be done on second visit
2. Intra oral films with bite tags should be preferred
3. Films should be supported with dental floss
4. Proper radiation hazard protection

5. Management Modifications¹

Periodontal

1. Gingivectomy may be considered for the patient with drug-induced gingival overgrowth if the tissues interfere with occlusion or oral hygiene.
2. Generally periodontal packs may not be well tolerated; in that case electrosurgery or laser surgery techniques should be considered as an option.
3. Due to poor oral hygiene, frequent recall examinations and prophylaxis are often indicated as often as every 2 or 3 months.
4. Encourage independent oral hygiene.

Restorative

1. Glass ionomer restorations may be more appropriate for patients with a high caries rate due to fluoride release.
2. Stainless steel crowns may be more appropriate for restoring severely damaged teeth, when the patient's lack of cooperation precludes more complicated procedures required for fixed prosthodontics or where lack of funds is a consideration.
3. In addition, bonded restorations can eliminate the need for pins and thereby reduce the overall time for the procedure.
4. Sedation or general anaesthesia may be required.

Endodontic

1. Individuals who cannot tolerate a removable prosthesis will benefit from maintaining even severely worn teeth as occlusal stops. Endodontic treatment should be considered when a tooth is restorable and the patient can cooperate.
2. Single-appointment procedures are advisable.
3. As working-length radiographs would be difficult to obtain, an apex locator would be helpful.

Prosthetic

1. Fixed prosthodontics is more appropriate than removable one if patient's oral compliance is there.
2. Resin bonded bridges are more useful and less time consuming for tooth preparation.
3. Fixed prosthesis is absolutely contraindicated for epileptic patients as it may lead to trauma and aspiration during event.
4. Patients must be able to remove, clean and place removable prostheses.
5. Removable prosthesis and complete denture are also contraindicated for patient whose seizures are poorly controlled.
6. Complete dentures are contraindicated in poor muscle control and in severe and profound MR.

Follow-up Care

Individuals should be evaluated at least annually by a neurologist or a paediatrician with respect to management.

Making a difference in the oral health of a person with mental retardation may go slowly at first, but determination can bring positive results and invaluable rewards. A significant impact not only on patient's oral health, but on their quality of life as well has been shown by applying proper management technique.

Down Syndrome

Down syndrome is a chromosome disorder associated with an extra chromosome (Trisomy 21) resulting in intellectual disability and specific physical features⁷⁴.

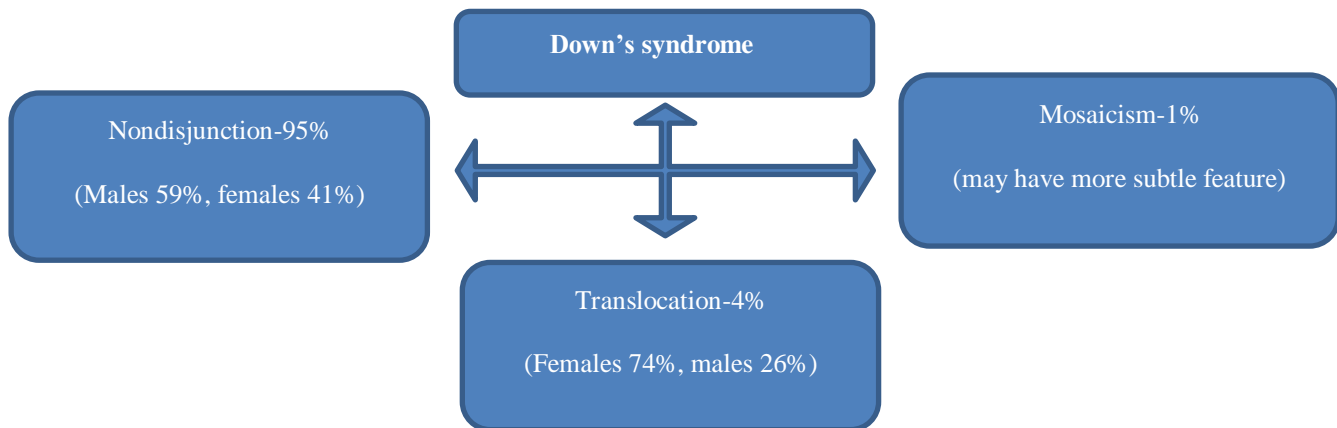
John Langdon Down (1862)¹¹ first characterized Down Syndrome as a distinct form of mental disability.

In 1959, the French physician **Jerome Lejeune** identified Down Syndrome as a syndrome as a chromosomal condition.

Types

Three types of chromosomal abnormalities can lead to Down syndrome which is summarised in below Flowchart.

- Medical complications seem to be similar in all three groups⁹.



Flowchart:- Down's syndrome.

Oral Manifestations

Mouth

1. Small drooping mouth
2. Open mouth posture Tongue
3. Protrusive, fissured (scrotal) tongue.
4. Circumvallate papillae may be enlarged, but filiform papillae may be absent.
5. Macroglossia.

Lips

Thick, dry, fissured.

Occlusion

Anterior open bite and crossbite, class III tendency, small maxilla.

Palate

1. Often appears high with horizontal palatal shelves (omega palate).
2. Bifid uvula, cleft lip and palate. Eruption of Teeth Retarded Early shedding of deciduous teeth

Teeth

1. Hypodontia, especially third molars and maxillary lateral incisors.
2. Microdontia.
3. Hypocalcification and hypoplastic defects.
4. Low incidence of caries.

Periodontium

Severe, early onset periodontal disease due to local factors like poor oral hygiene, tooth morphology and malocclusions and systemic factors such as decreased humoral response, reduced chemotaxis, impaired phagocytosis, poor circulation, etc.

Management Of Down Syndrome in Dental Office Behavioural Management Considerations

Many children with Down syndrome can successfully be treated in the dental office.

Guidance:

1. Plan a pre-appointment (in person/phone) to discuss patient special needs prior to the first visit. Discuss this with the parent or care provider-they know the child best.
2. Early morning appointments or best time of day for patient.
3. Talk with the parent or caregiver to determine the patient's level of intellectual and functional abilities and explain each procedure at a level the patient can understand.
4. Speak to patient using short and clear instructions.
5. Avoid abrupt distractions, such as sights and sounds, which may make patient unco-operative.
6. Start the oral examination slowly, using only fingers at first. If this is successful, begin using dental instruments.
7. Always use the tell-show-do approach when introducing new instruments or procedures.
8. Positive verbal reinforcement helps behaviour modification. Small rewards can be given.

Treatment Consideration

1. Pleasant, cheerful, affectionate and cooperative, and dental procedures can be provided without compromise.
2. Work at a slower pace.
3. Emphasis should be placed on preventive dental care with frequent follow up visit to monitor oral hygiene like fluoride application, pit and fissure sealants, silver diamine fluoride, etc.
4. Light sedation and immobilization may be indicated in those children who are moderately apprehensive.
5. Severely resistive patients may require general anaesthesia.
6. Adequate analgesia should be prescribed to keep the child comfortable as they may not be able to express pain or discomfort due to their learning disability.
7. If the surgery requires that the neck is placed in a non-neutral position for a long time intraoperatively, then cervical spine radiography should be performed before an elective case.
8. Children are generally affectionate and cooperative and present no special problems during management.
9. Pulp treatment in deciduous teeth is contraindicated in patients with cardiac problems because of the risk of bacteraemia, whereas in permanent teeth it can be considered if an adequate apical seal can be obtained.

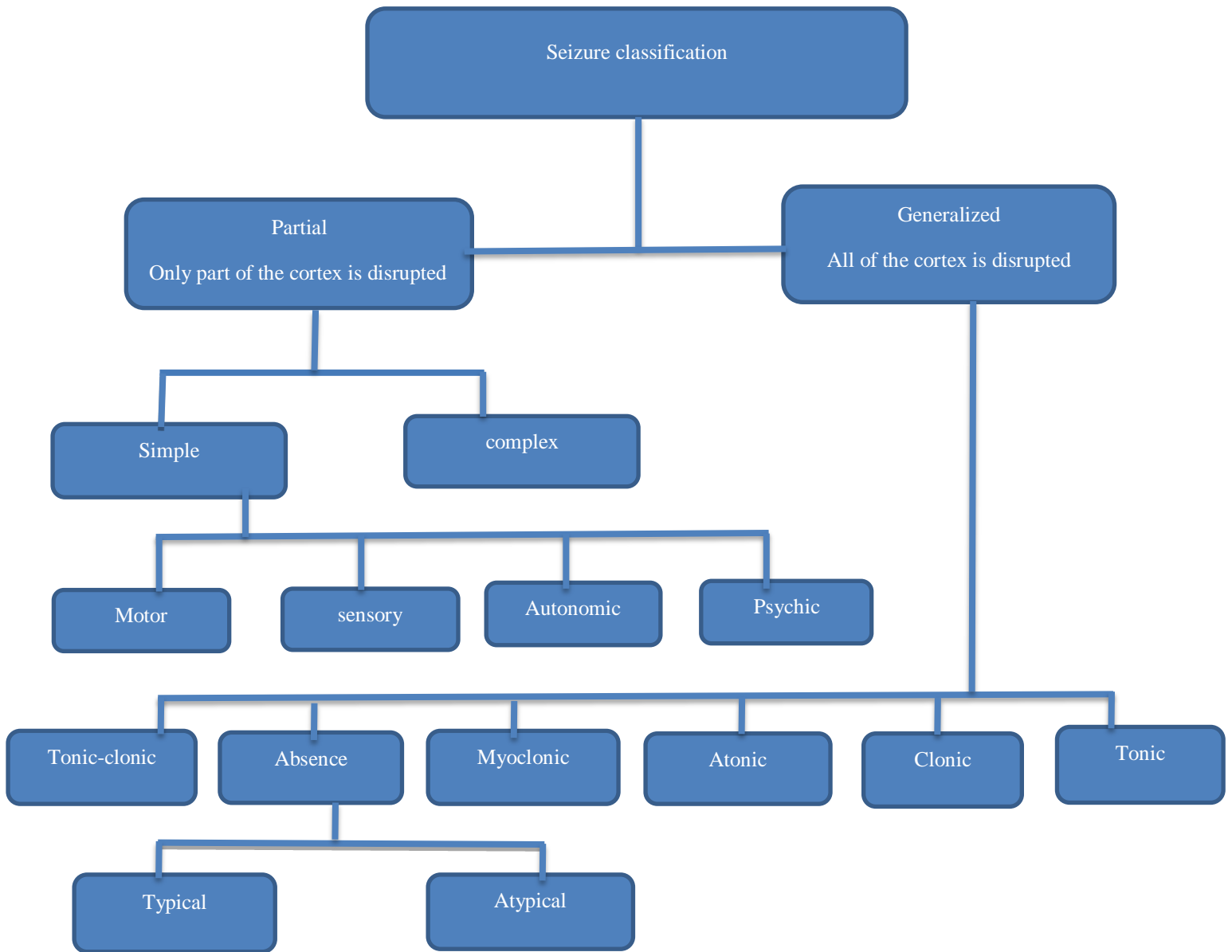
Epilepsy

Introduction

The word "epilepsy" is derived from the Greek word "epilambanein" meaning to take or to seize. Between 400 BC and 200 AD Hippocrates, Aretaeus, Celsus, and Plinius all provided careful descriptions of major and minor seizures. Hippocrates even recognized that seizures originated in the brain⁸

Modern medicine defines epilepsy as a chronic neurological disorder characterized by frequently recurrent seizures. A seizure is a sign of a disease, which manifests as an episodic disturbance of movement, feeling, or consciousness caused by sudden synchronous, inappropriate, and excessive electrical discharges that interfere with the normal functioning of the brain⁸⁹.

Classification of Epilepsy are summarised in Flowchart¹³.



Flowchart : Seizure's Classification

Table: International Classification of the Epilepsies (1989)¹⁴.

1. Localization related (focal, partial)
 - A. Idiopathic
 - i. Benign childhood epilepsy with centrotemporal spikes
 - ii. Childhood epilepsy with occipital paroxysms
 - iii. Primary reading epilepsy
 - B. Symptomatic
 - i. Temporal lobe epilepsy
 - ii. Frontal lobe epilepsy
 - iii. Parietal lobe epilepsy
 - iv. Occipital lobe epilepsy
 - v. Chronic progressive epilepsia partialis continua of childhood
 - C. Cryptogenic defined by
 - i. Seizure type
 - ii. Clinical features
 - iii. Aetiology
 - iv. Anatomic localization
2. Generalized
 - A. Idiopathic
 - i. Benign neonatal familial convulsions
 - ii. Benign neonatal convulsions
 - iii. Benign myoclonic epilepsy infancy
 - iv. Childhood absence or epilepsy
 - v. Juvenile myoclonic epilepsy
 - vi. epilepsies with grand mal
 - vii. Seizures on awakening
 - viii. other generalized idiopathic epilepsies
 - B. cryptogenic or symptomatic
 - i. west syndromes
 - ii. lennox-gastnut syndromes
 - iii. epilepsy with myoclonic-astatic seizures
 - iv. epilepsy with myoclonic absences
 - v. nonspecific aetiology
 - vi. early myoclonic encephalopathy
 - vii. early infantile epileptic encephalopathy with suppression burst
 - viii. other symptomatic generalized epilepsies
 - C. symptomatic
3. undetermined epilepsies
 - A. generalized and focus
 - i. Neonatal seizures
 - ii. severe myoclonic epilepsy in infancy
 - iii. epilepsy with continuous spike wave during slow wave sleep
 - iv. acquired epileptic aphasia
4. special syndromes
 - A. situation-related seizures
 - i. febrile convulsions
 - ii. isolated seizures or isolated status epilepticus
 - iii. seizures occurring only when there is an acute or toxic event due to factors such as alcohol, drugs, eclampsia, non-ketolic hyperglycemia.

General Oral Features

1. Malocclusion and poor oral hygiene
2. Erythematous gingiva
3. Traumatic occlusion

Signs of the Seizure at Dental Chair

1. Brief warning (variable)
2. Sudden loss of consciousness
3. Patient becomes rigid, falls, may give a cry
4. Cyanosis
5. After 30 seconds, there are jerking movements of the limbs
6. The tongue may be bitten (clonic phase)
7. Seizures lasting 5 minutes or longer (or rapidly repeated): Frothing of saliva from the mouth
8. Urinary incontinence
9. Seizure only lasts for a few minutes—the patient may then become flaccid but remain unconscious
10. Regains consciousness but may be confused.

Management Of Seizure at The Dental Office¹

1. Do not attempt to restrain
2. After convulsive movements have subsided, put patient in recovery position, no need for medical care unless: Injury is prolonged or repeated, (atypical seizures)
3. Call for an ambulance after 5 minutes
4. For convulsive movements give buccal midazolam (Epistatus) NB/1 bottle contains 4 adult doses
5. Adults and children over 10 years
6. 1 mL [one millilitre (10 mg)]
7. Children
8. 6–12 months 0.25 mL [quarter a millilitre (2.5 mg)]
9. 1–4 years 0.5 mL [half a millilitre (5 mg)]
10. 5–10 years 0.75 mL [three quarters of a millilitre (7.5 mg)]
11. One repeat dose only may be given 10 minutes later
12. Medical emergency began with evaluating and managing ABC— airway-breathing-circulation.
13. Position the child to manage ventilation, prevent injury, give a passive restraint to avoid injury.
14. Place him on the floor to avoid fall and injury.
15. Deliver oxygen to avoid hypoxemia.
16. Place a cloth between the teeth to avoid injuries to teeth and tongue biting.
17. Place intraoral section to clear away excess secretion and place the child toward the side.
18. Any seizure more than 10 minutes begin with diazepam at 0.1 m/kg IV.

Behavioural Management Considerations

1. Many children have seizures controlled or know when they are likely to have a seizure and seizure type so extensive precautions are unnecessary. 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.
2. Minimize seizure triggers. Reduce stress and anxiety by explaining procedures before starting. Keep bright light out of child's eyes or allow child to wear dark glasses.
3. Seizure management during treatment: Remove all dental instruments from the mouth. Clear the area around the dental chair. Stay with the child and turn child to one side. Monitor airway to reduce risk of aspiration.

Dental Management of the Epileptic patient¹³

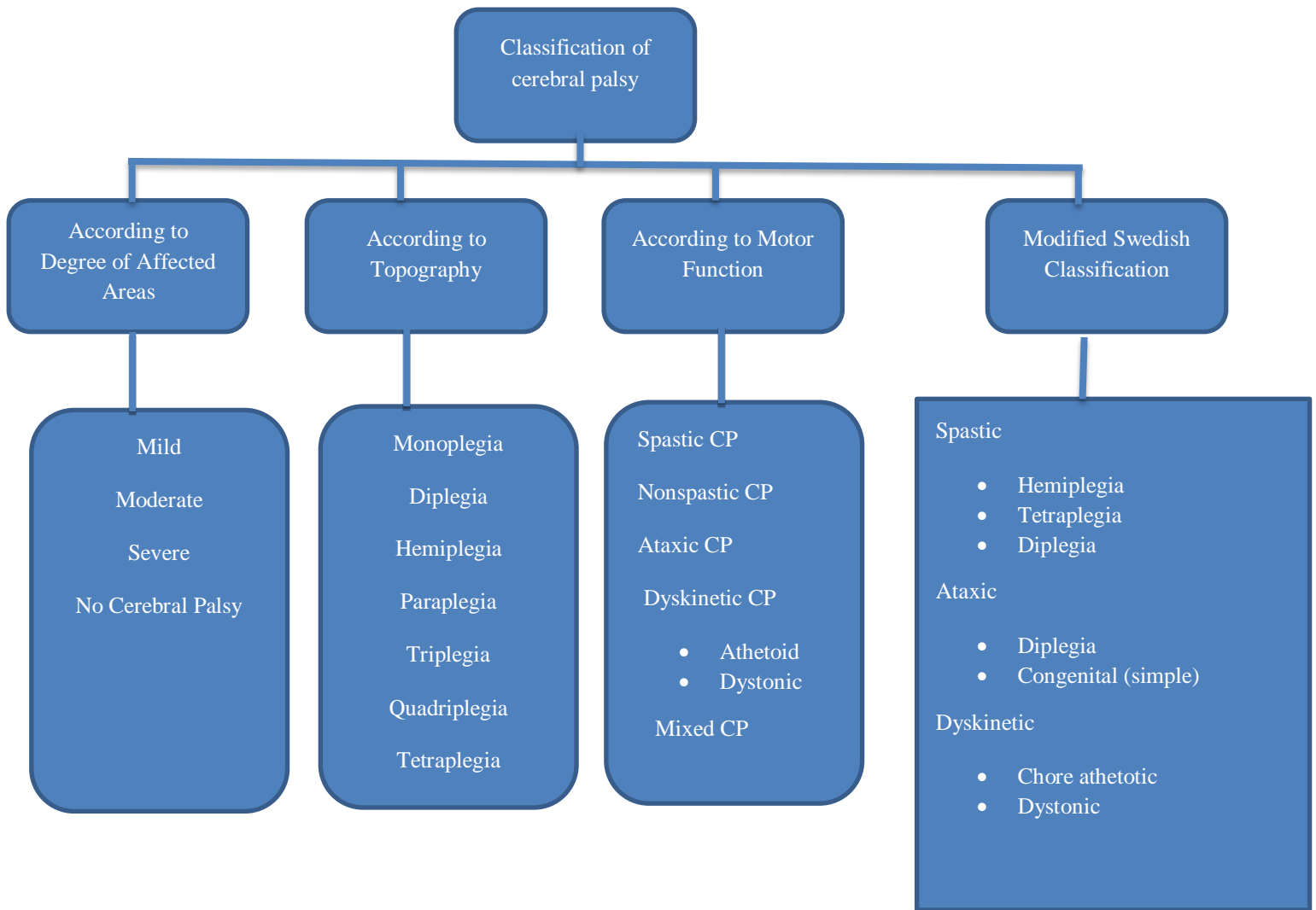
1. Take complete health history, for that different types of questions to be asked from the care giver and the proper history of medication also should be noted at the time of dental treatment.
2. List medications patient is taking. look them up so you know their effects. side effects. potential for drug interaction, and any specific oral effects.
3. Schedule proper frequency of oral hygiene and provide good oral hygiene instruction to ensure, healthy periodontal tissue and teeth.
4. Insure proper dental lighting (no light directly in eyes).
5. Ensure medications have been taken properly relative to dental appointments to minimize risk of seizure.

6. Perform proper periodontal and surgical treatment of gingival hyperplasia to minimize damage to teeth and supporting structures and to maintain proper aesthetics.
7. Treatment plan and design restorations to minimize risk of damaging or displacing dental restorations or prostheses during an epileptic seizure.
8. Patients should be made aware of local and national resources for information and support relative to their disease.
9. If the epileptic seizure occurs at the time of dental treatment steps taken to minimise the risk.

Cerebral Palsy

Cerebral palsy, which occurs in two to three out of 1,000 live births, has multiple aetiologies resulting in brain injury that affects movement, posture, and balance. Cerebral palsy (CP) is a group of disorders that affect a person’s ability to move and maintain balance and posture. Cerebral palsy is the most common motor disability in childhood. **Cerebral** means having to do with the brain. **Palsy** means weakness or problems with using the muscles. Cerebral palsy is caused by abnormal brain development or damage to the developing brain that affects a person’s ability to control his or her muscles.

Classification of Cerebral Palsy are summarised in Flowchart¹.



Flowchart:- Classification of Cerebral Palsy.

General Clinical Signs and Symptoms of Cerebral Palsy⁴

Spastic

1. Occurs in more than 60–70% of the cases
2. Caused by a lesion in the cerebral cortex
3. Tendency for the antigravity muscles to maintain a state of contraction and for the antagonists to lengthen, producing the characteristic flexion deformities, particularly in the large joints
4. Limited control of neck muscles, resulting in “head roll”
5. Spastic quadriplegia frequently associated with convulsions and MR
6. Increased motor tone resulting in stiffness
7. Impaired chewing and swallowing
8. Hypertonicity of facial muscles
9. Slow jaw movement
10. Hypertonic orbicular muscles
11. Spastic tongue thrust
12. Drooling of saliva
13. Constricted mandibular and maxillary arches
14. Class II, division II malocclusion (75%), usually with unilateral posterior crossbite.

Clinical Manifestations

In many patients with cerebral palsy, certain neonatal reflexes may persist long after the age at which they normally disappear. This is because the subcortical dominance of the infant’s behavior is suppressed by higher centres of nervous system. Three of the most common reactions, which a dentist should recognize, are:

- (1) asymmetric tonic neck reflex,
- (2) tonic labyrinthine reflex, and
- (3) startle reflex.

Some of the common manifestations are:

1. Abnormalities of muscle tone
2. Delayed milestones
3. No control over movements
4. Muscle weakness
5. Spasticity and loss of coordination
6. Retention of primitive reflexes
7. Poor development of gross and fine motor control
8. Apraxia
9. Impaired cortical sensation
10. Impaired sensation of movement
11. Impaired proprioception
12. Contractural deformities.

Management

To an uninformed dentist, a person with CP might be perceived as an uncooperative and unmanageable patient. A clinician who is not knowledgeable about physically and mentally disabling conditions may feel uncomfortable about treating such patients and may refuse to do so. The following suggestions are offered to the clinician as being of practical significance in treating a patient with cerebral palsy⁴⁹:

1. Consider treating a patient who uses a wheelchair in the same itself
2. Ask about a preference for the mode of transfer. If the patient has no preference, the two-person lift is recommended
3. Make an effort to stabilize the patient’s head through all phases of dental treatment
4. Try to place and maintain the patient in the midline of the dental chair with arms and legs as close to the body as feasible. Keep the patient’s back slightly elevated, to minimize swallowing (supine position)
5. On placing the patient in the dental chair, determine the patient’s degree of comfort and assess the position of the extremities. Do not force the limbs into unnatural positions
6. Use immobilization judiciously for controlling movements of the extremities.

Autism

Introduction

Autism Spectrum Disorders (ASD) are a diverse group of conditions. They are characterised by some degree of difficulty with social interaction and communication. Other characteristics are atypical patterns of activities and behaviours, such as difficulty with transition from one activity to another, a focus on details and unusual reactions to sensations.

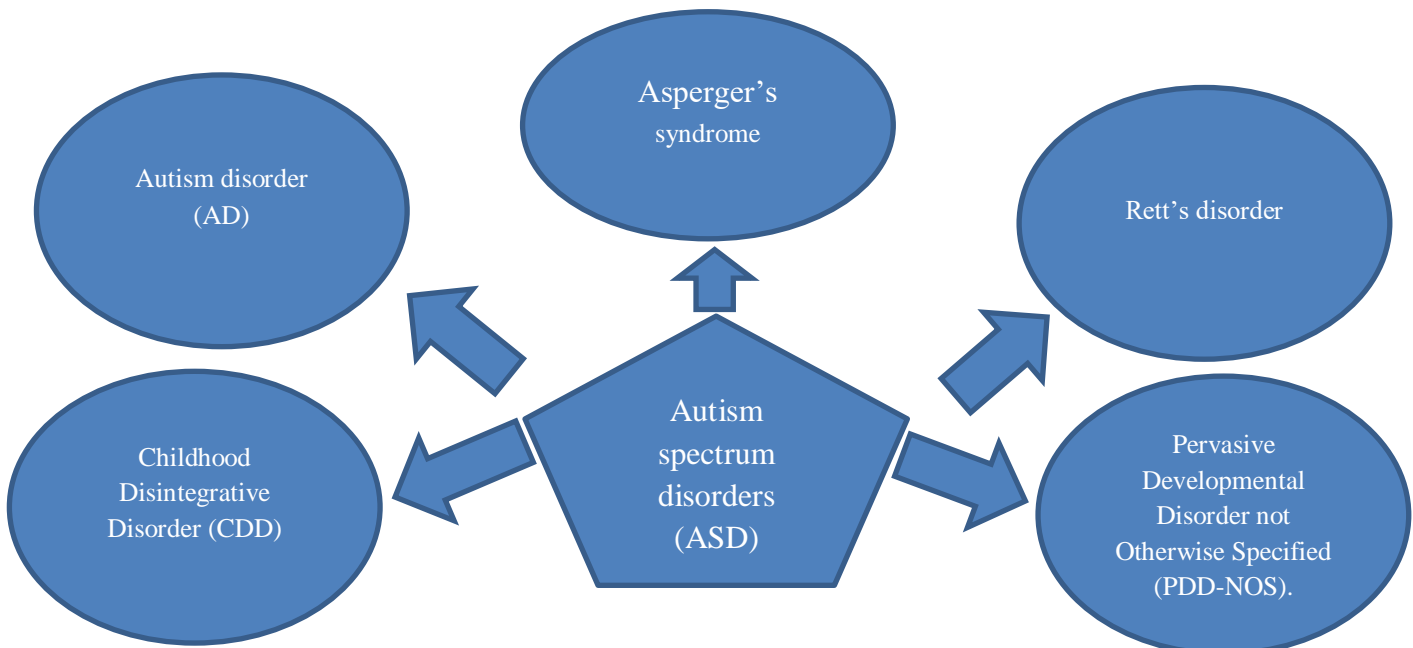
The **Autism Spectrum**, often referred to as just **autism** or in the context of a professional diagnosis **autism spectrum disorder (ASD)** or **Autism Spectrum Condition (ASC)**, is a neurodevelopmental condition characterized by difficulties in social interaction, verbal and nonverbal communication, and the presence of repetitive behavior and restricted interests. Other common symptoms include unusual responses to sensory stimuli, and an insistence on sameness or strict adherence to routine.

Classification

Autism spectrum disorders (ASDs), which is often used synonymously with pervasive developmental disorders (PDDs), is a collective term given to autistic child.

It consists of five subtypes, which include (Flowchart):

- (1) autism disorder (AD),
- (2) Asperger's syndrome,
- (3) Rett's disorder,
- (4) childhood disintegrative disorder (CDD), and
- (5) pervasive developmental disorder not otherwise specified (PDD-NOS)



Flowchart :- Autism spectrum disorders (ASD) consists of five subtypes

Classification and Characteristics of Autism spectrum disorders (ASD)

Autism is not one singular condition - individuals will fall somewhere on the autism spectrum, hence the term "Autistic Spectrum Disorder" (ASD). This ranges from non-verbal individuals with severe learning difficulties, to those with above-average IQs, often displaying extreme ability in particular areas.

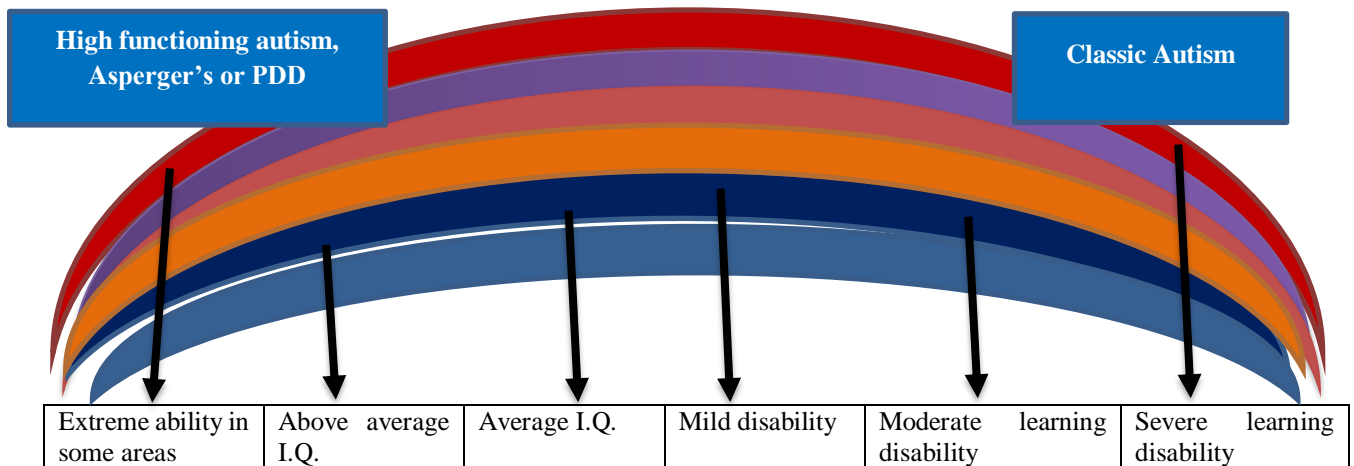


Fig:- Autism Spectrum Conditions.

Signs and Symptoms of Autism Spectrum Disorder¹⁵

Social Communication and Interaction Skills

1. Avoids or does not keep eye contact
2. Failed to respond to name by 9 months of age
3. Failed to show facial expressions like happy, sad, angry, and surprised by 9 months of age
4. Does not play simple interactive games like pat-a-cake by 12 months of age
5. Uses few or no gestures by 12 months of age (for example, does not wave goodbye)
6. Failed to share interests with others by 15 months of age (for example, shows you an object that they like)
7. Does not point to show you something interesting by 18 months of age
8. Failed to notice when others are hurt or upset by 24 months of age
9. Failed to notice other children and join them in play by 36 months of age
10. Failed to pretend to be something else, like a teacher or superhero, during play by 48 months of age
11. Does not sing, dance, or act for you by 60 months of age.

Restricted or Repetitive Behaviours or Interests

1. Lines up toys or other objects and gets upset when order is changed
2. Repeats words or phrases over and over (called echolalia)
3. Plays with toys the same way every time
4. Is focused on parts of objects (for example, wheels)
5. Gets upset by minor changes
6. Has obsessive interests
7. Must follow certain routines
8. Flaps hands, rocks body, or spins self in circles
9. Has unusual reactions to the way things sound, smell, taste, look, or feel.

Other Characteristics

1. Delayed language skills
2. Delayed movement skills
3. Delayed cognitive or learning skills
4. Hyperactive, impulsive, and/or inattentive behavior
5. Epilepsy or seizure disorder
6. Unusual eating and sleeping habits
7. Gastrointestinal issues (for example, constipation)
8. Unusual mood or emotional reactions
9. Anxiety, stress, or excessive worry
10. Lack of fear or more fear than expected

Clinical Features

1. These children seem to be self-sufficient and introvert and want to be left alone
2. They have little or no attachment to their parents. Unlike ordinary children, who when tired or unhappy reach for a parent, autistic children remain detached
3. Whereas autistic children relate poorly to persons, they frequently relate well to objects like moving or shiny inanimate objects, such as a string of keys or a spinning top, for hours
4. They may typically display affection or anger with a toy.

Dental Findings of an Autistic Child ⁴ (Fig.36)

Although there appears to be no known autism-specific oral manifestations, oral problems might arise because of autism-related behaviours.

1. **Higher susceptibility to caries:** Due to soft and sweetened food, pouching due to poor tongue coordination and difficulties in brushing and teeth flossing
2. **Bruxism:** Forceful grinding of the teeth is one of the sleep disorders in autistic children
3. **Damaging oral habits:** Such as tongue thrusting, picking at the gingiva, lip biting, and pica
4. **Traumatic injuries:** Traumatic ulcerated lesions usually brought on by self-injury from head banging, picking, or face tapping
5. **Texture sensitivities:** Food texture sensitivities lead to the consumption of refined and high-sugar diet
6. **Gingivitis and poor oral hygiene:** Occur due to heavy plaque accumulation and hormonal influences are the likely explanations for the dental concerns.

Management In Dental Office^{16,17}

1. Behavioural Management
2. Educational Management
3. Treatment Consideration
4. Dental clinic environment
5. Appointments
6. Modified treatment
7. Pharmacological Management

Visual Impairment

Introduction

A person's vision may drastically change throughout life due to several internal and external factors, such as genetics or stress. This results in problems known as **visual impairment**¹⁸.

Visual impairment is the consequence of the functional loss of vision rather than an eye disorder itself, however, sensory disabilities alone do not require changes in treatment methods

Classification

According to WHO (2010)¹⁹ vision impairment classifies as:

Distance vision impairment:

1. Category 0: No or mild visual impairment –presenting visual acuity better than 6/18
2. Category 1: Moderate visual impairment –presenting visual acuity worse than 6/18 and better than 6/60
3. Category 2: Severe visual impairment –presenting visual acuity worse than 6/60 and better than 3/60
4. Category 3: Blindness –presenting visual acuity worse than 3/60 and better than 1/60
5. Category 4: Blindness—presenting visual acuity worse than 1/60 with light perception
6. Category 5: Blindness—irreversible blindness with no light perception.

International Classification of Diseases (2018) classifies vision impairment into two groups, distance and near presenting vision impairment.

Distance vision impairment:

1. Mild – visual acuity worse than 6/12 to 6/18
2. Moderate – visual acuity worse than 6/18 to 6/60
3. Severe – visual acuity worse than 6/60 to 3/60

4. Blindness – visual acuity worse than 3/60

Oral manifestation

1. As such visual impairment would not have direct implication on the dentition but may have secondary limitation due to the handicapping conditions. Unfortunately, with such big problems around, the dental health is often found to be neglected and later present as the major areas of concern.
2. Previous research has indicated that visually impaired children had generally poor oral hygiene, with a sufficiently high prevalence of caries.
3. Trauma to anterior teeth occurs at high frequency than normal population in visually impaired children.

Management

General consideration for treatment the visually impaired children²⁰

1. A distinction should be made between children who at one time had sight and those who have not and thus do not form visual concepts.
2. More explanation is needed for children in the latter category to help them perceive the dental environment.
3. Dentists should realize that congenitally visually impaired children need a greater display of affection and love early in life and that they differ intellectually from children who are not congenitally visually impaired.
4. Although explanation is accomplished through touching and hearing, reinforcement takes place through smelling and tasting.
5. The modalities of listening, touching, tasting, and smelling are visual impairment extremely important for these children.

Dental management considerations depend upon²¹:

- Degree of visual impairment
- Age of onset
- Presence of other handicapping conditions
- Degree of independence
- Patient attitude and behavior
- Parental attitude and behaviour.

Audio-tactile performance technique (ATP)

This is introduced recently which is nothing but the development of language and perception is affected by the motor activities. It is very effective communication tool along with the sensory incorporation. The ATP technique incorporates three components namely, Audio, Tactile and Performance. The children were first verbally informed about the importance of teeth and method of brushing (AUDIO). They were made to feel the teeth on a large sized model (TACTILE). The children were then taught to brush on the model with assistance. They were asked to feel their own teeth with their tongue and deposits if present was identified with the feeling of roughness. The children were taught to brush their own teeth with assistance (PERFORMANCE).

Hearing Impairment

Introduction

Hearing loss, the most common form of human sensory deficit, is the partial or total inability to hear sound in one or both ears. It may be a sudden or a progressive impairment that gradually gets worse over time.²²

In children, hearing problems can affect the ability to acquire spoken language, and in adults it can create difficulties with social interaction and at work.²³

Hearing loss can be temporary or permanent. Hearing loss related to age usually affects both ears and is due to cochlear hair cell loss.²⁴

In some people, particularly older people, hearing loss can result in loneliness²⁵. Deaf people usually have little to no hearing.

Classification

A. Based on Severity of Disease²⁶

1. Mild -- 26–40 dB HL
2. **Moderate**-- 41–60 dB HL
3. **Severe**-- 61–80 dB HL
4. **Disabling**-- >80 dB HL

B. Based on Anatomy of Ear²⁷

a) Conductive

1. Conductive Hearing Loss occurs when sound is not conducted efficiently through the outerear canal to the middle ear due to any cause.
2. Conductive hearing loss accounts for 90%–95% of all childhood hearing loss.

b) Sensorineural

Sensorineural Hearing Loss occurs when there's damage to the internal ear or to the nerve pathways from the ear to the brain that is vestibulocochlear nerve or sensory relay center for auditory stimulus. So, injury at the cochlea or proximal to the cochlea is termed as sensorineural hearing loss.

c) Mixed

Mixed hearing loss is defined as conductive hearing loss and sensorineural hearing loss.

C. Based on Cause^{27,28}

a) Congenital

Associated with

1. Syndromes – e.g., Down syndrome
2. Infection-- Cytomegalovirus (CMV), rubella virus, Toxoplasma gondii, herpes virus, and HIV
3. Malformations-- heart disease or dysmelia

b) Acquired

Associated with

1. Infections: Bacterial meningitis, particularly from Streptococcus pneumoniae,
2. Traumatic
3. Autoimmune: systemic lupus erythematosus, rheumatoid arthritis, myasthenia gravis, and Hashimoto's thyroiditis
4. Neoplastic: tumour, toxic substances

D. According to Clinical Characteristic²⁶

1. Syndromic
2. Non- syndromic

E. According to Time of Onset

1. Congenital
2. Perinatal
3. Postnatal

F. According to Time of Manifestation

1. Prelingual
2. Perilingual
3. Post-lingual

G. Based on Hearing Loss

- | | | | |
|---|-------------|----|--------------|
| a) | Unilateral | or | Bilateral |
| Hearing loss is in one ear (unilateral) or both ears (bilateral). | | | |
| b) | Pre-lingual | or | Post-lingual |
| Hearing loss happened before a person learned to talk (pre-lingual) or after a person learned to talk (post-lingual). | | | |
| c) | Symmetrical | or | Asymmetrical |
| Hearing loss is the same in both ears (symmetrical) or is different in each ear (asymmetrical). | | | |
| d) | Progressive | or | Sudden |
| Hearing loss worsens over time (progressive) or happens quickly (sudden). | | | |

- | | | | |
|--|-------------|----|------------------|
| e) | Fluctuating | or | Stable |
| Hearing loss gets either better or worse over time (fluctuating) or stays the same over time (stable). | | | |
| f) | Congenital | or | Acquired/Delayed |
| Hearing loss is present at birth (congenital) or appears sometime later in life (acquired or delayed onset). | | | |

Signs And Symptoms

1. Difficulty using the telephone
2. Loss of sound localization
3. Difficulty understanding speech, especially of children and women whose voices are of a higher frequency.
4. Difficulty understanding speech in the presence of background noise
5. Sounds or speech sounding dull, muffled or attenuated
6. Need for increased volume on television, radio, music and other audio sources
7. Hearing loss is sensory, but may have accompanying symptoms:
8. Pain or pressure in the ears
9. A blocked feeling
10. Secondary Symptoms are:
11. Hyperacusis, heightened sensitivity with accompanying auditory pain to certain intensities and frequencies of sound, sometimes defined as "auditory recruitment"
12. Tinnitus, ringing, buzzing, hissing or other sounds in the ear when no external sound is present
13. Vertigo and disequilibrium
14. Tympanophonia, also known as autophonia, abnormal hearing of one's own voice and respiratory sounds, usually as a result of a patulous (a constantly open) eustachian tube or dehiscent superior semi-circular canals
15. Disturbances of facial movement (indicating a possible tumour or stroke) or in persons with Bell's palsy.

Oral Manifestation²⁹

The clinical characteristics of the oral cavity do not differ greatly from the rest of the individuals:

1. **Hard tissue alterations**
2. **Enamel hypoplasia**-- more prevalent due to Rubella which is the common cause of deafness.
3. **Dental demineralization**
4. **Dental Wear**-- due to Bruxism
5. **Dental caries**-- Due to the lack of hygiene, the type of diet and the lack of control visits to the dentist.
6. **Periodontal disease**- with the lack of oral hygiene in these patients with disability, have a greater predisposition to develop periodontal disease.
7. **Malocclusions**-- There are several genetic determinations that favour the development of malocclusions in most patients with physical and psychic disabilities. The most common being the Angle class III and class II occlusion is the least common.
8. **Self-harm**-- These are acts of self-aggression that result in tissue damage. Behaviours of aggression tend to manifest themselves in the context of developmental disorders. These patients may be hit or bitten by any part of the body, mainly the hands, face, and jaw.

Treatment Consideration

1. The following should be considered when treating a hearing-impaired patient:
2. Prepare patient and parent before appointment
3. Let the patient determine during the initial appointment how the patient desires to communicate
4. Assess speech, language ability and degree of hearing impairment when taking the patients complete medical history.
5. Enhance visibility for communication, watch the patient expression
6. Reassure the patient with physical contact, without visual contact the child may be startled.
7. Employ the tell-show-feel-do approach
8. Hearing impaired children may be very sensitive to vibration
9. Display confidence
10. Avoid blocking the patient's visual field
11. Adjust the hearing aid before the handpiece is in operation
12. Make sure the parent and patient understand the explanations of diagnosis, treatment and payment. Deaf persons have different levels of skill with English. Use of an interpreter is extremely helpful.

Conclusion:-

Children represent the future of our society and ensuring their healthy growth and development ought to be a prime concern of all.

But coming to their oral conditions, it is found that the dental health is neglected and is directly or indirectly very much related to their disability due to lack of proper motion skills. The prevalence of special child in our country has been significant increased in recent years due to good medical facilities.

The dental condition of children with special health care needs (CSHCN) may be directly or indirectly related to their disabilities. Children with SHCN relatively have poor oral hygiene and increased prevalence of gingival diseases and dental caries. Unfortunately, the importance of dental care for these children has often been overlooked by the health planners. Parents of disabled children usually do not seek dental treatment as they also have the burden of medical treatment. In the past, the emphasis was based on providing basic dental care, but in recent years, the dental profession has shown increased concern in providing complete oral health care to the mentally- or physically-challenged children. The specialty of paediatric dentistry provides both primary and comprehensive, preventive and therapeutic oral health care to children with SHCN. These special children are entitled to the opportunity to achieve appropriate rehabilitation, to enable them to realize their maximal level of functioning, and to assist them in not only “normalizing” their lives but also lengthening their life span.

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