

**Oral Health Care Considerations Associated with the Down syndrome
Patient:
Related Diseases and Restoration of Function and Esthetics**

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PHYSICAL AND OROFACIAL CHARACTERISTICS OF D.S.

Cardiac abnormalities

- 50% have some sort of congenital defect (virtually 100% are correctable)
- May need SBE Prophylaxis for some repaired defects

Head and Neck

- underdeveloped mid-face, resulting in a flat facial profile
- flat occiput (back of head)
- short broad neck
- underdeveloped sinuses
- smaller mid and lower face skeleton - normal size tongue, soft palate, etc.
- flat nasal bridge - wearing glasses can be difficult (esp. for children)

Eyes

- outer corners slant upwards (**palpebral fissures**)
- inner corners - pronounced **epicanthal folds** - normal in all infants
- wide nasal root
- **Brushfield spots** - white dots on the iris
- lacrimal duct problems, blepharitis
- more frequent need for glasses
- higher incidence of accommodation problems - restricted close-up vision

Ears

- small, low set, may have absent lobules
- increased incidence of otitis media - with corresponding hearing loss (have VERY small eustacean tubes)
- **sensitivity to loud noises** - may be a factor in dental visits

Musculoskeletal System

- muscle hypotonia - improves with age
- affects position of teeth
- chewing ability (efficiency) - more food stays on teeth

Ligamentous laxity

- hyperflexibility of joints

- all ligaments are affected - even those that hold the teeth?, also TMJ

Neurological

- 90 % of all MR is in the mild range (IQ of 51-70) - should be able to be treated in a normal dental setting with minimal problems
- because of **delayed language development**, these patients may not be able to communicate at the same level at which they understand - be sure the staff in the dental office knows this
 - PAIN - may express pain more slowly and less precisely, but the pain threshold may be normal - use pain control measures

Social and Emotional

- social skills may exceed intellectual skills
- many love a routine; will be excellent patients once they've figured out the routine

Immune System

- impaired
- increased incidence of oral diseases - aphthous ulcers, periodontal disease, thrush in babies
- increased URI's contribute to mouth breathing

Primary maxillofacial defect

- underdeveloped mid face - can cause relative **Prognathism** (described as **Maxillary Endognathism**)
- contributes to open bite

Tongue

- relative macroglossia - tongue size is normal but jaws are small
- influences tooth position
- reverse swallow influences tooth position
- **fissured tongue** - from mouth breathing, increases over time
- mouth breathing may be from small nasal airway
- also have enlarged tonsils and adenoids

- Palate** - looks high, but is really narrow and constricted
- food may get stuck more easily

- Salivary glands** - persons with DS may have less saliva from mouth breathing, meaning teeth don't get as clean
- some studies show altered (higher) pH - which may affect the caries rate (less acidic pH) - increased buffering capacity

Teeth

- delayed eruption - up to 2-3 years late
- abnormal sequence of eruption
- more frequent missing teeth

- irregularities of teeth
- microdontia, more spaces between teeth

Hypodontia (missing teeth) , Oligodontia (missing over 6 teeth) - close to 100% are missing teeth - this can be a blessing because of reduced size of jaws

- roots of teeth tend to be smaller

Results of two studies

- 1) 38% missing teeth - max. laterals most frequently missing
- 2) 63% missing teeth - mand. laterals most frequently missing
next most frequent was 2nd premolars

May NOT need to floss so much!

Mastication and Swallowing:

- abnormalities due to
 - 1) muscle hypotonicity - food less chewed, larger bulks of food swallowed
 - 2) TMJ Ligamentous laxity - contributes to mandibular protrusion
 - 3) Tongue thrust - lack of anterior seal causes development of reverse swallow, affects position of teeth
- Clenching or Grinding may develop to obtain a comfortable position.

DENTAL DISEASE

Caries

Incidence of Decay - reported to be lower

decay in primary dentition - Can occur. These kids may stay on the bottle longer (but there is a corresponding delay in eruption)

- **adult decay** - may be higher in DS due to decreased muscle tone and inefficient chewing
- some studies show a higher pH in saliva, lower salivary flow (mouth breathing?), and a higher degree of salivary scialic acid.
- less efficient chewing, decreased muscle tone, food stays on teeth longer

Periodontal Disease -

- severe, early onset of perio disease in DS
- thought to be due to the compromised immune system, not just poor OH
- 90-96% of persons w/ DS have perio disease
- Gingivitis may not be reversible (chronic) in DS due to mouth breathing
- need more frequent cleaning appointments
- manifestations similar to that of Juvenile Periodontitis (similar bacteria), and destruction occurring on mandibular incisors.
- onset - mid teen years
- increased incidence of ANUG
- shorter tooth roots

Studies to determine exact cause of perio disease in DS

- IA, IgM, IgG, albumin levels, all w/in normal levels

- higher proportion of IgG1

Treatment of Perio Disease: early, aggressive

- treat teenagers as you would an older adult. Frequent recalls
- possible antibiotic therapy -tetracycline - (also helps with skin and blepharitis)

Malocclusion

- 100% of persons with DS have some sort of malocclusion
- many due to underdeveloped maxilla and oligodontia

Types of Malocclusion

- Mandibular overjet - 69%
- Posterior crossbite - 97%
- Anterior Open Bite - 54%
 - from mouth breathing, thumb sucking, reverse swallow
 - swallow 2400 times a day!
 - forces of tongue greater than lips and cheeks due to decreased muscle tone
- Class III occlusion - 65%

Bruxism

Multifactorial Origin

- 1) Anxiety, stress
- 2) malocclusion
- 3) Oral posture - underdevelopment of nervous system control
- 4) Ligaments in TMJ

Treatment:

- 1) try to determine when it occurs, day, night, periods of stress - can try distracting to a different behavior
- 2) nightguard therapy
- 3) occlusal rehabilitation to correct malocclusion

Orthodontics and Down syndrome

- should be able to incorporate into regular ortho practice
- key is patient cooperation - many teens w/ DS today are concerned about appearance, jobs, dating, etc.
- pt. must be able to handle x-rays, appliance delivery, etc.
- pt. must have a certain amount of manual dexterity for removable appliances
- pt. must have good home care

Prosthodontics and Down syndrome

- limited choices due to periodontal disease, tooth mobility
- implants may be an option if periodontal disease is controlled
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Dental Implants in the patient with DS

- few studies done so far
- higher rate of failure (23%?) but very patient specific

- lack of maxillary sinuses should be a good thing
- fixed or removable may not be good options, because of short root

CONSIDERATIONS IN DENTAL CARE

Why early dental treatment may not be sought -

Medical - other, more pressing problems

Financial - these kids are expensive!

Social, Emotional - fear of dentists (by parents), may not know the need, transportation may be a problem

Low Priority by Insko's & physicians

Anticipated behavior - tendency to wait until child is more mature

Medical considerations of Dental treatment

Cardiac –

Atlanto axial instability

Medications

Systemic considerations; diabetes, epilepsy, Alzheimer's Local anesthesia generally ok

NO2 doesn't work very well – patients are mouth breathers

Aging and Down syndrome

- Current life expectancy is ~ 60

- by age 50, approx. 50% some signs of dementia, 100% show plaques in brain indicating Alzheimer's disease in post mortems

- 40% of adults have thyroid disease

- 50% over age 50 have epilepsy

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Anesthesia considerations

- **local is ok**

- NO2 is generally ok, but doesn't work very well - mouth breathing

- oral sedation - pt may be overly sensitive

General anesthesia considerations

- AAI - very critical. radiographs, informed consent, may wear a cervical collar

- use of much smaller tubes for intubation

- cardiac - SBE prophylaxis

-- use pulse oximeter due to obstructive airway disease

- increased incidence of pulmonary vascular disease in this population

Regular Dental Visits

- pts. w/ DS may need more frequent cleanings than insurance companies allow for. Will have to explain this to the parents.

1) Early introduction to office

2) Neuromuscular stimulation of oral cavity (decrease gag reflex)

3) parent education

4) establish good home care program

They may not need any “treatment” for years, but it’s still important to have regular visits. Parents may not understand this. It’s a lot of trouble to take an uncooperative child to the dentist. Same as to the hairdresser!

Dental Appointments -

- need to have good communication with Dentist and staff
- complete medical history prior to appointment - dentist can consult with physician if necessary - also dental history, oral history
- schedule appointments early in the day - both child and dentist more rested
- ask staff to schedule extra time for appointment
- first visit should be for orientation only

Behavior Management -

- good behavior in the dental office is **learned**
- child may or may not do better if the parent is present in the operatory - depending on the child’s age?
- the right motivating factor can go a long way
- Tell - Show - Do
- positive reinforcement definitely works better on this group
- restraints - must have parental permission – Rainbow wrap, etc.
- pre-med - may need more than a general dentist for this
- severe cases may require general anesthesia - lots of work and a very uncooperative patient - done in a hospital setting

PREVENTION AND HOME CARE:

Teeth and gums must be cleaned **properly** at least once a day

Mouth props - can be a big help

- with small kids, can position them on the floor in your lap as well

mechanical toothbrushes - **easier to use**, some may require less brushing time

- built in timers are good for kids

Flossing - once a day

- difficult with DS - but important because of predisposition to periodontal disease
- floss holders may be helpful
- **Disclosing tablets** - big help when teaching kids, or checking on their brushing

Fluoride - two kinds of sources

- 1) Systemic - water, vitamins - will lower decay 50-60%
 - important while teeth are forming in the bone
- 2) Topical - toothpaste, gels, rinses

- helpful as long as teeth are in the mouth

Sleep Apnea

- periods of time when breathing stops during sleep
- persons with DS are prone to this due to low muscle tone and small airways
- **symptoms**: snoring, restlessness during sleep, unusual sleep positions
 - Resulting in sleepiness, irritability, behavior problems
- **Diagnosis** - sleep disorders clinic
- **Treatment** - positive airway pressure, dental appliances, surgery
- **Consequences** of not treating: increased developmental delay, pulmonary hypotension, congestive heart failure
- Greater degree of Central Sleep Apnea (as opposed to Obstructive Sleep Apnea) found. Due to CNS (at brainstem level)
- Increases with age, due to obesity
- snoring has almost been accepted as normal with these kids, but it's NOT
- all babies w/ DS should be evaluated by an ENT

Causes of Sleep Apnea in DS

- 1) hypoplastic mid face
- 2) muscle hypotonia
- 3) increased incidence of URI's - stuffy nose, hypertrophy of tonsils and adenoids
- 4) mouth breathing - can cause pharynx to develop with side narrowing
- 5) obesity - with increasing age

Future of individuals with Down syndrome

- there are currently approximately 214,000 individuals with DS in the USA (2020)
- with the advent of improved low risk pre-natal testing, the rate of terminations is increasing dramatically. Termination rate in the US ranges from 67- 92%
- it is important to give prospective parents balanced information regarding what having a child with Down syndrome is like.