Cerebral palsy
Definition

• Non-progressive, non-transmissible permanent motor conditions causing activity limitations, caused by disturbances that occurred in the developing fetal or infant brain.

• The motor disorders of CP - often accompanied by:
  ➢ disturbances of sensation, perception, cognition, communication, behavior
  ➢ epilepsy
  ➢ secondary musculoskeletal problems.
CP classification

- 4 types:
  - spastic – the most common
  - dyskinetic
  - hypotonic
  - mixed
CP = the most common cause of severe physical disability in childhood

- 1-4 per 1000 live births
- 10 times higher in premature children
- 25 times higher in underweight at birth children

(Raducanu et al, 2008)
Etiology

• Multifactorial:
  ➢ prenatal causes (genetic diseases, embryonic anomalies)
  ➢ perinatal causes (hypoxia, Rh incompatibility, premature birth, underweight at birth etc.)
  ➢ postnatal causes (infections, trauma etc.)
Symptoms

- muscular rigidity or spasms
- involuntary movements
- difficulties of the “gross motor skills”:
  - walking
  - running
- difficulties of the “fine motor skills”:
  - writing or doing up buttons
  - brushing the teeth
Health issues often associated with CP

• mental retardation
• epilepsy
• sensorial deficiencies (sight and hearing impairment)
• persistent primitive reflexes
• attention-, memory-, learning- and emotional problems
• language and speaking disturbances.
Oral manifestations

CP itself does not cause any specific oral problems. However, several conditions are more common or more severe in people with CP than in the general population:

- dental caries
- periodontal disease
- dental erosion
- sialorrhea
- bruxism
- dental trauma
- malocclusion
- enamel hypoplasia
- temporomandibular joint disorders
- abnormal oral habits - tongue thrust, mouth breathing
- hyperactive bite, gag reflexes
Dental caries

• Increased risk of developing dental caries
• Children with more severe neurological insult - greater risk
• Causes:
  – lack of oral hygiene maintenance (due to severe motor incoordination)
  – soft diet
  – sweetened medications
  – mouth breathing
  – food pouching
Periodontal disease

• Gingival hyperplasia and bleeding - higher frequency

• Contributive factors:
  – difficulties in conducting daily oral hygiene
  – intraoral sensitivity
  – oro-facial motor dysfunction
  – use of antiepileptic drugs (phenytoin)
Dental erosion

• Both primary and permanent teeth can be affected, most commonly the upper molars, lower molars and upper incisors.

• Main factors:
  - gastroesophageal reflux disease
  - swallowing difficulties
  - recurrent chest infections
Sialorrhea

• occurs in up to 30% of children with CP

• Causes:
  – dysfunction in the coordination of swallowing mechanisms (pseudo-bulbar palsy)
  – hypotonia
  – open bite
  – lack of lip seal
Bruxism

• a common problem in children with CP, particularly those with severe motor and cognitive deficits.

• may lead to teeth abrasion and flattening of biting surfaces.
Traumatic dental injuries

• General risk factors:
  – motor deficits
  – epilepsy

• Local factors:
  – malocclusion with prominent maxillary incisors
  – incompetent lips.

• Most common type of injuries: enamel and dentine fracture
Malocclusions

- Over-bite, overjet and anterior open-bite - most commonly

Factors

- mouth breathing
- lip incompetence
- long face
- pseudo-bulbar palsy
- oro-facial incoordination
- hypotonia

Maloclusion in patients with CP is associated with: tongue thrusting and excessive drooling
Enamel defects

- enamel defects located in a symmetrical manner in both primary incisors and first molars
- cause: premature birth (<37 weeks)
- high risk for dental caries
Temporomandibular joint disorders

• Risk factors:
  – male gender
  – the presence and severity of any malocclusion
  – mouth breathing
Abnormal habits

- Tongue thrust
- Tongue interpositioning
- Mouth breathing
- Finger sucking
Important for the paediatric dentist

- Clear paths for movement throughout the treatment setting
- Obtain and review patient’s medical history; consultation with physician, family, caregivers
- Short appointments, frequent breaks
- Instruments and equipment out of patient’s way
- Muscle relaxants when long treatment is needed
Important for the paediatric dentist

• Calm and supportive environment (may reduce the frequency/intensity of uncontrolled movements)
• Do not try to stop patient’s movements, anticipate them, work around them
• Gentle but firm pressure on patient’s arm/leg if it begins to shake
• Avoid noises, bright lights, sudden movements (explain these stimuli before they appear) → triggers for uncontrolled, forceful movements
Important for the paediatric dentist

- Mouth guards/bite splints for patients with bruxism (uncomfortable/unwearable in patients with gagging/swallowing problems)
- Patients with gag reflex
  - appointments in the morning, before eating/drinking
  - place patient’s chin in neutral/downward position
Important for the paediatric dentist

• Listen carefully, be patient (sometimes communication is difficult)
• Explanations at a level the patient can understand (+ extra time for instructions/procedures, oral health issues)
• Simple, concrete, repeated instructions, one direction at a time
• TELL-SHOW-FEEL-DO technique
• Same staff every time = familiarity + cooperation
Important for the paediatric dentist

CP + SEIZURES

• Seizures usually can be controlled with anticonvulsivant drugs

• Record seizure’s history: frequency, medication, triggers

• Seizure management:
  – remove all instruments, clear the area around working place, do not place any objects between teeth during a seizure
  – turn patient in one side, monitor the airway
Important for the paediatric dentist

- Assistance if patient can’t move safely in the dental office
- Use of other senses, tactile feedback
- Look at the patient when you explain, warn before upcoming
- Written instructions in large print
Important for the paediatric dentist

- Adjustment of hearing aids/turn them off to avoid auditory discomfort
- Patient that reads lips:
  - normal rhythm and tone, loud voice
  - remove mask/use of clear face shield
  - eliminate background noise
- Patient that uses sign language: discussion with caregiver about terms and needs
- Visual feedback, eye contact
Important for the paediatric dentist

- Allow time to express himself—patience
- Discuss with caregiver if you can’t understand patient’s speech
- Slightly upright position for treatment
- Recommendations:
  - rinses with plain water/water + baking soda solution x4/day
  - use of fluoride gels, rinse, toothpaste
Dental management

- Dental examination and treatment procedures can be performed on patient’s wheelchair
- Travel pillows can be used to help hold patient’s head
- Parental help is welcome
# Dental management

## Treatment in the wheelchair
- can be reclined/molded
- lock the wheels
- sliding/transfer board to support the head and neck

## Transfer from wheelchair to dental chair
- padding/pillows for easier transition
- smooth transfer
- place and maintain the patient in the center of the chair
- arms and legs in natural, comfortable position
Safe wheelchair transfer

1. **Determine the patient’s needs** (preferred transfer method, ability to help, special paddings/device for collecting urine, probability of spasms)

2. **Prepare the dental operatory** (remove dental chair’s armrest/move it out, dental chair’s position- the same height/slightly lower)

3. **Prepare the wheelchair** (close and parallel with dental chair, special padding/equipment)

4. **Two-person transfer** (patient support & safe transfer)

5. **Position the patient after transfer** (in the center of dental chair)

6. **Transfer from the dental chair to wheelchair**
Dental management

- Mouth prop can be used while performing dental examination and simple dental procedures (not suitable for patients with impaired swallowing)

- Conscious sedation with N\textsubscript{2}O during dental care controls stress in CP patients, as verified by a decrease in heart rate, and does not promote respiratory depression. Higher concentrations of N\textsubscript{2}O are recommended for CP patients with tachycardia (Baeder et al, 2017).
Dental management

• For uncooperative patients / patients who require extensive dental treatment - dental treatment under sedation or GA.

Radical treatment options are recommended (→ limit need for reintervention) – e.g. extraction versus pulpotomy
Orthodontic treatment

- May not be an option → high risk of caries & enamel defects
- Almost impossible in patients with moderate/severe cerebral palsy
  **BUT** CP should not represent a barrier
- Good oral hygiene daily → success of orthodontic treatment
Preventive measures

• Primary PREVENTION – early age – DENTAL HOME
• Regular dental checkups → every three months
• Topic fluoridation
• Sealants
• Parents/caretakers – to be informed of the importance of:
  – oral hygiene maintenance
  – healthy dietary habits – limited sugar consumption
Suggestions for family/caregivers

• Patient should drink water often, use sugar-free drugs and rinse with water after taking medicines
• Find alternatives to sugary foods and beverages as rewards
• After every meal: rinse with water to remove food and medicine from the mouth
• Clean the remaining food with a finger wrapped in gauze
• Emergency attitude in case of oral trauma (early presentation to the dentist, localization of missing pieces of a fractured tooth, permanent tooth replantation/tooth-saving kit)
Daily oral hygiene

- Encourage independence
- Hands-on demonstrations
- Use of antimicrobial agents,
  e.g. Chlorhexidine – spray, bottle/toothbrush
- Advice for caregivers
  - proper brushing demonstrations
  - flossing techniques
  - sitting/standing positions
  - same location, timing, positioning

Dentist demonstrating flossing to mum:
  - support child’s head
  - use of floss with holder
Toothbrushing

- Use toothbrushes with modified handle – better grip

- Electric toothbrushes can help, especially for children with limited cooperation
Toothbrushing

For children who are unwilling or unable to cooperate – use restrain methods:

– child is placed in the parent’s lap to stabilize the head with one hand while using the other hand to brush the teeth

– an older child - recline on a chair or bed; the parent angles the head backward with one hand while the teeth are brushed with the other hand

– for a more difficult to manage child - the patient’s hands will be restrained by a second or third person

Link catre Parents’ Corner – video Tudor , video Vlad