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METHODS AND TOOLS FOR PRIMARY PREVENTION OF DENTAL CARIES AT DIFFERENT AGES

video lecture for the 3^{d} year students,
majoring in the specialty 31.05.03 Dentistry

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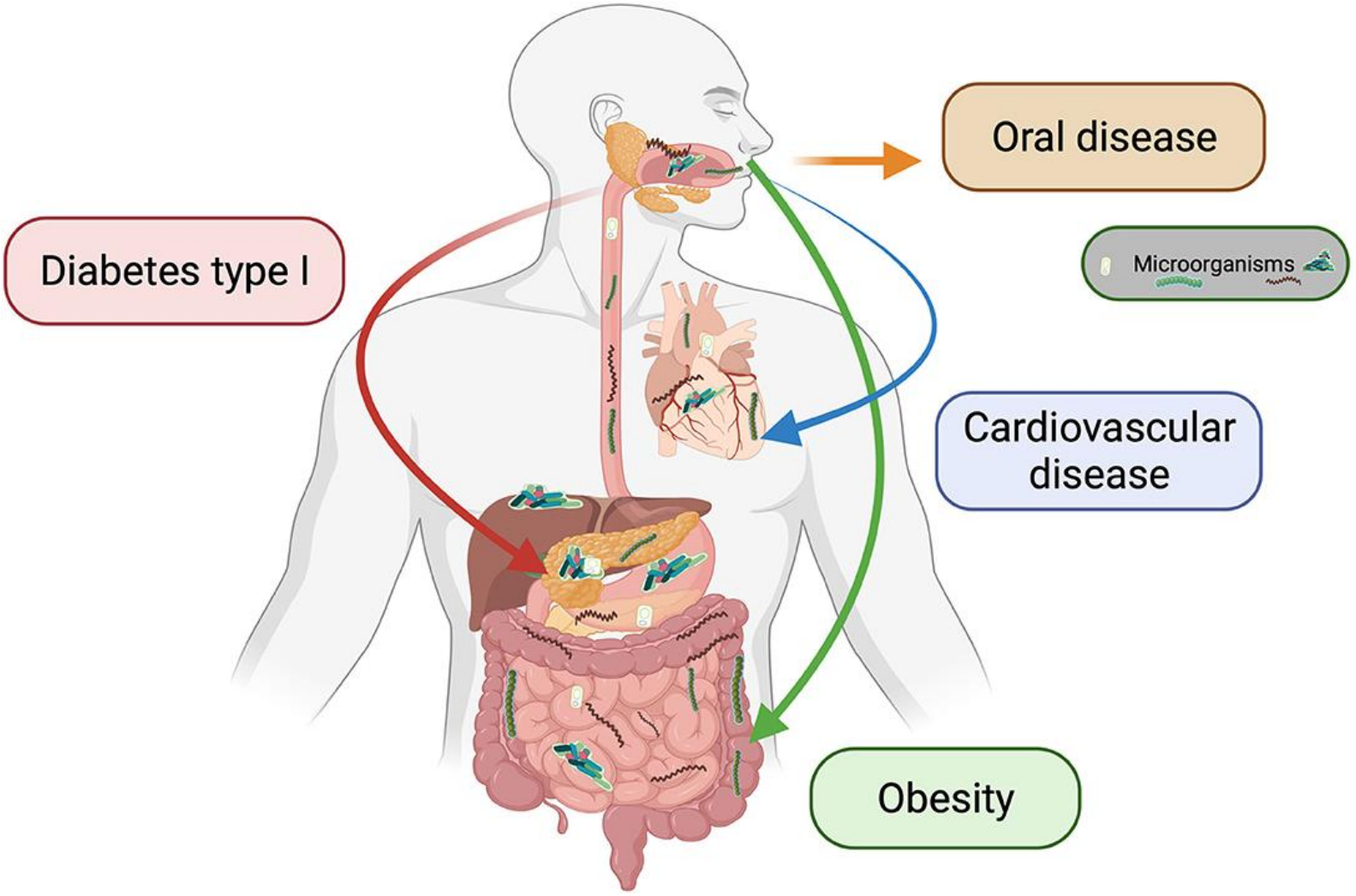
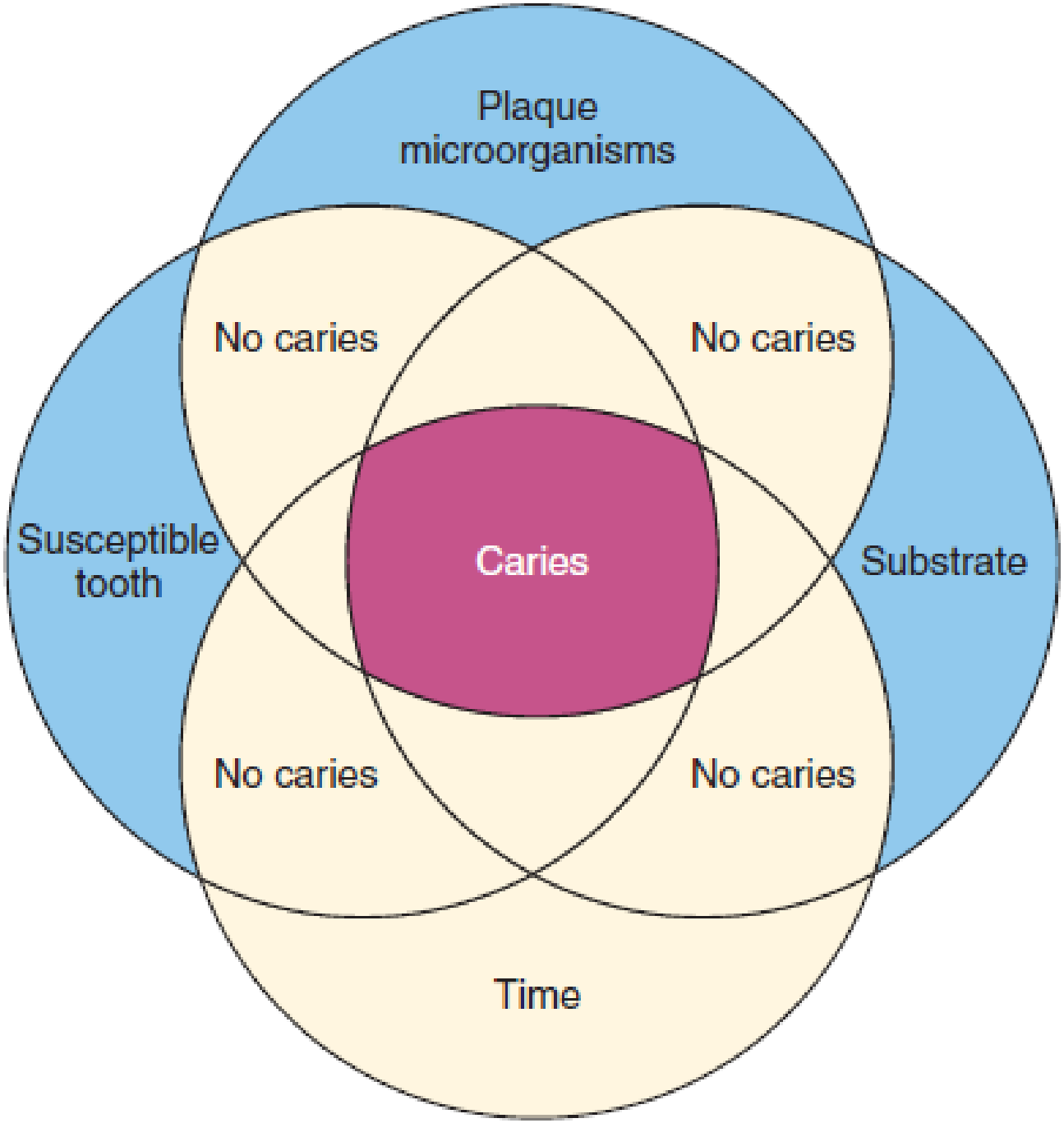
Content

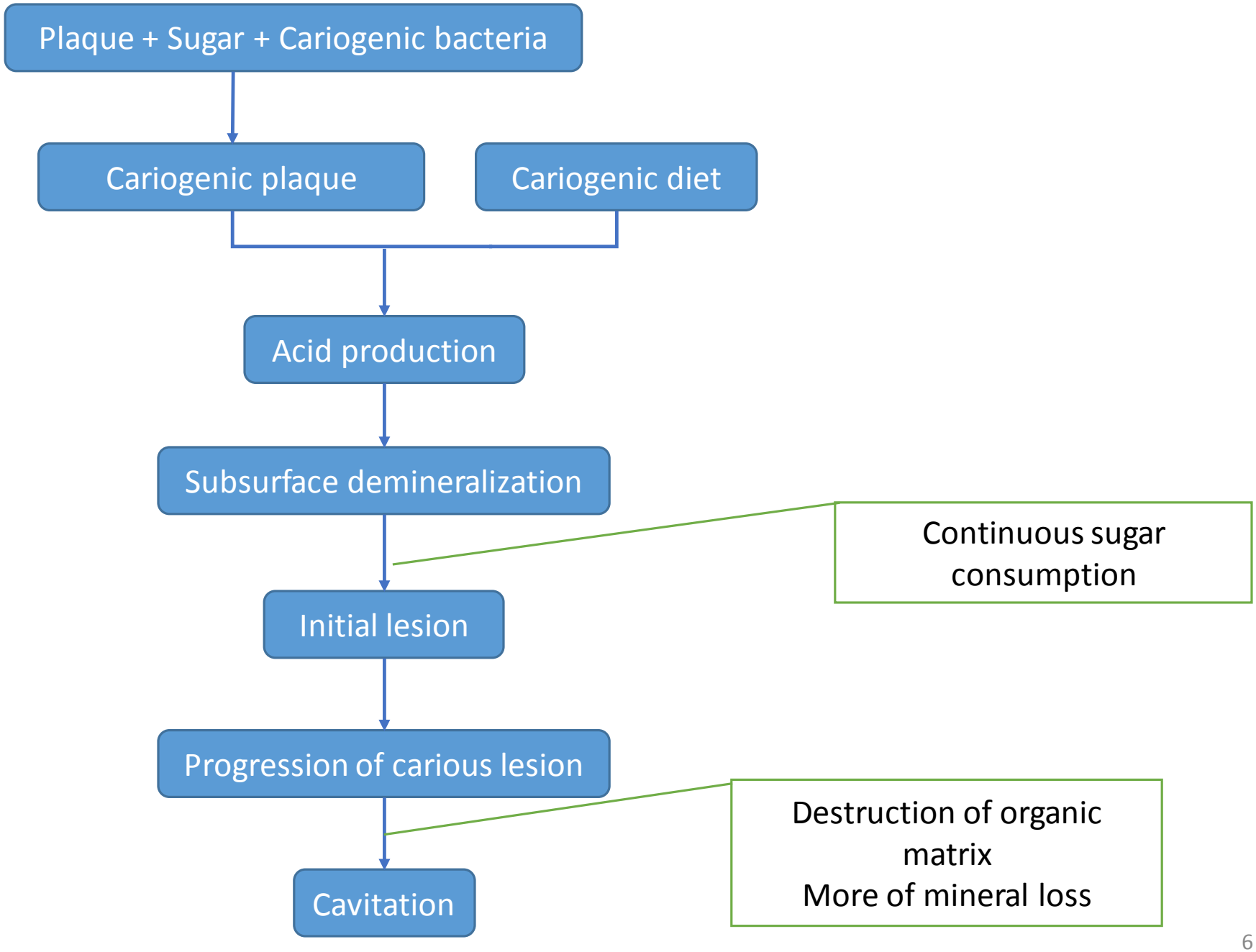
- 1 Relevance of the topic
- 2. Description of the carious process
- 3. Types of preventive care
- 4. Methods of primary prevention of dental caries
- 5. Risk factor assessment
- 6. Peculiarities of prevention of dental caries at different ages

Relevance of the topic

Relevance of the topic




Plaque
microorganisms
No caries
No caries
Susceptible
tooth
Caries
Substrate
No caries
No caries
Time


Plaque + Sugar + Cariogenic bacteria
Cariogenic plaque
Cariogenic diet
Acid production
Subsurface demineralization
Continuous sugar consumption
Initial lesion
Progression of carious lesion
Destruction of organic matrix
More of mineral loss
Cavitation

The WHO approaches for the primary prevention of chronic diseases

Primordial prevention

Population (mass) strategy

High risk strategy

World Health Organization

General principles of preventive dentistry

1. Control of disease
2. Patient education and motivation
3. Development of host resistance
4. Restoration of function
5. Maintenance of oral health

Control of Disease

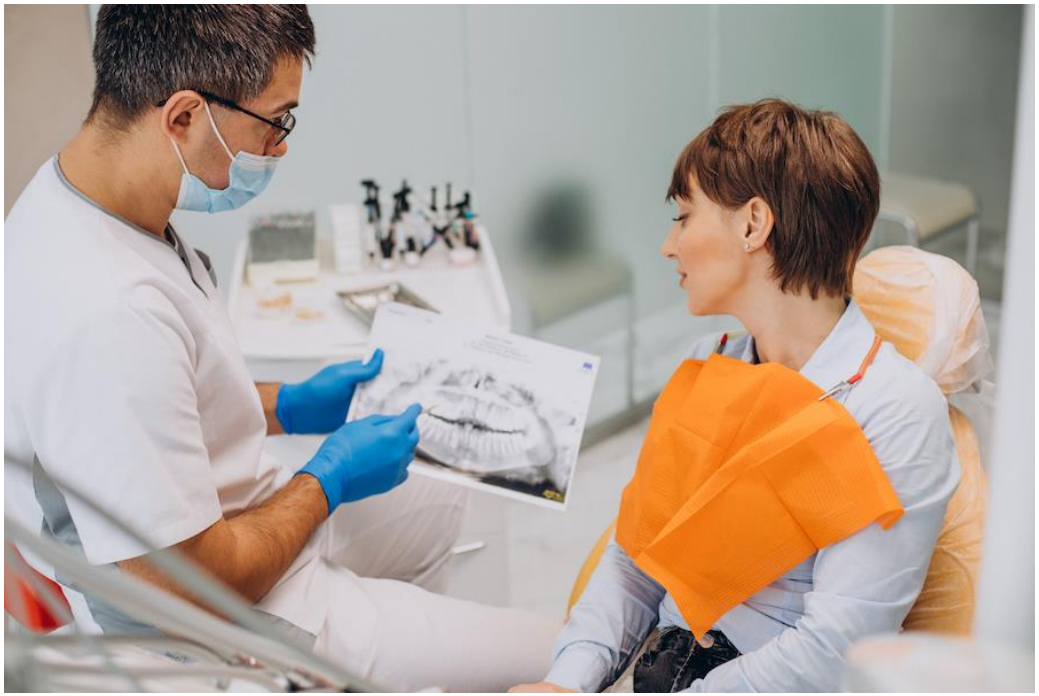
Emergency treatment and relief from pain

Active caries should be controlled

Removal of plaque and calculus

Extraction of infected teeth

Patient Education and Motivation



Evaluation and education by audiovisual aids

Home care

Development of Host Resistance

Nutrition and balanced diet

Water fluoridation

Topical fluorides

Use of dentifrice and mouthwashes

Restoration of Function

Permanent restoration
Prosthodontic, orthodontic treatment

Periodic dental check-up

Methods to prevent dental caries

- assessment of caries risk factors
- oral hygiene education and control
- professional oral hygiene
- application of fluorides (systemic and topical)
- application of calcium-containing products
- fissure sealing of temporary and permanent teeth
- minimally invasive treatment
- dental education and motivation to maintain oral health (including nutritional advice)

Local risk factors

1. Plaque and factors contributing to its formation and accumulation :

- poor oral hygiene;

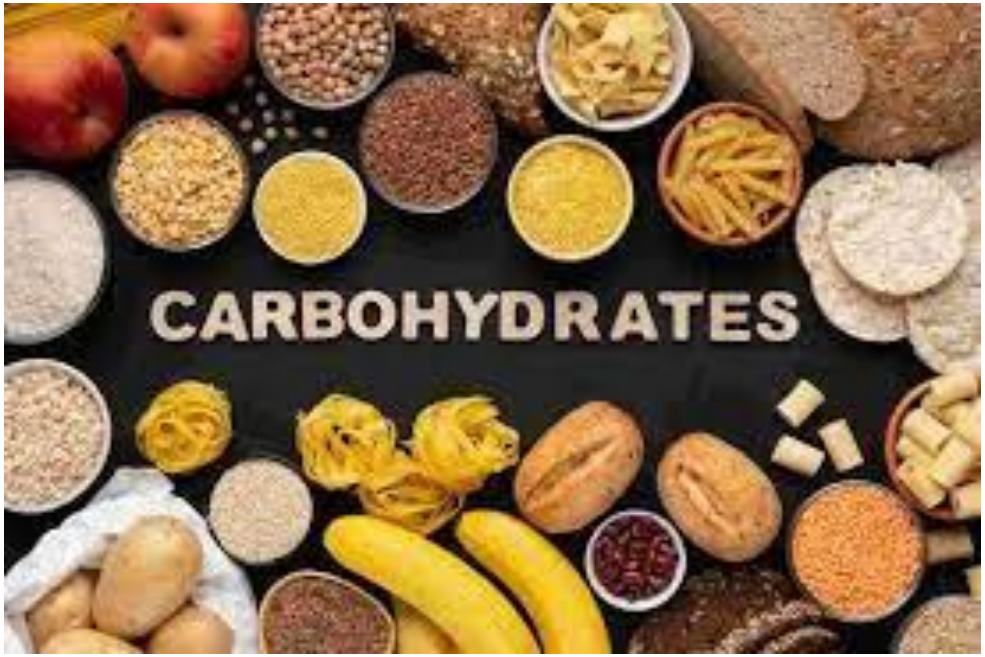
- prevalence of soft food rich in easily fermentable carbohydrates in the diet;

- condition of the tooth outside the occlusion, lack of an antagonist;

- presence of braces, crowded teeth, orthopaedic constructions, overhanging edges, defects and rough surfaces of fillings;

Local risk factors

2. Frequent consumption of easily fermentable carbohydrates (especially sugars)



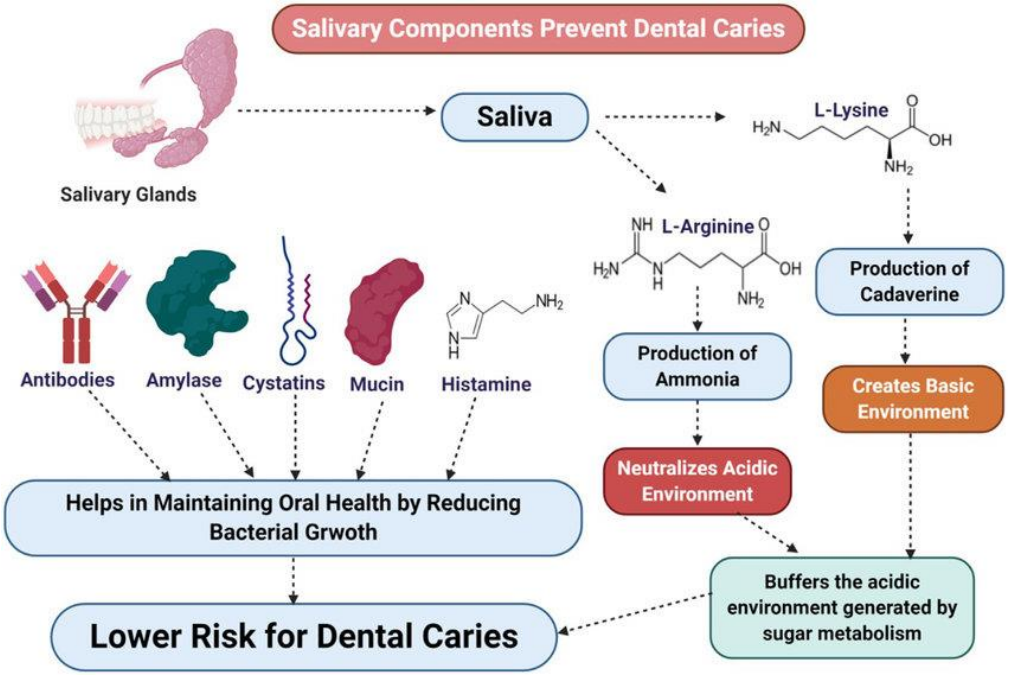
Local risk factors

3. <u>Oral fluid characteristics</u>:

-reduced salivary flow rate

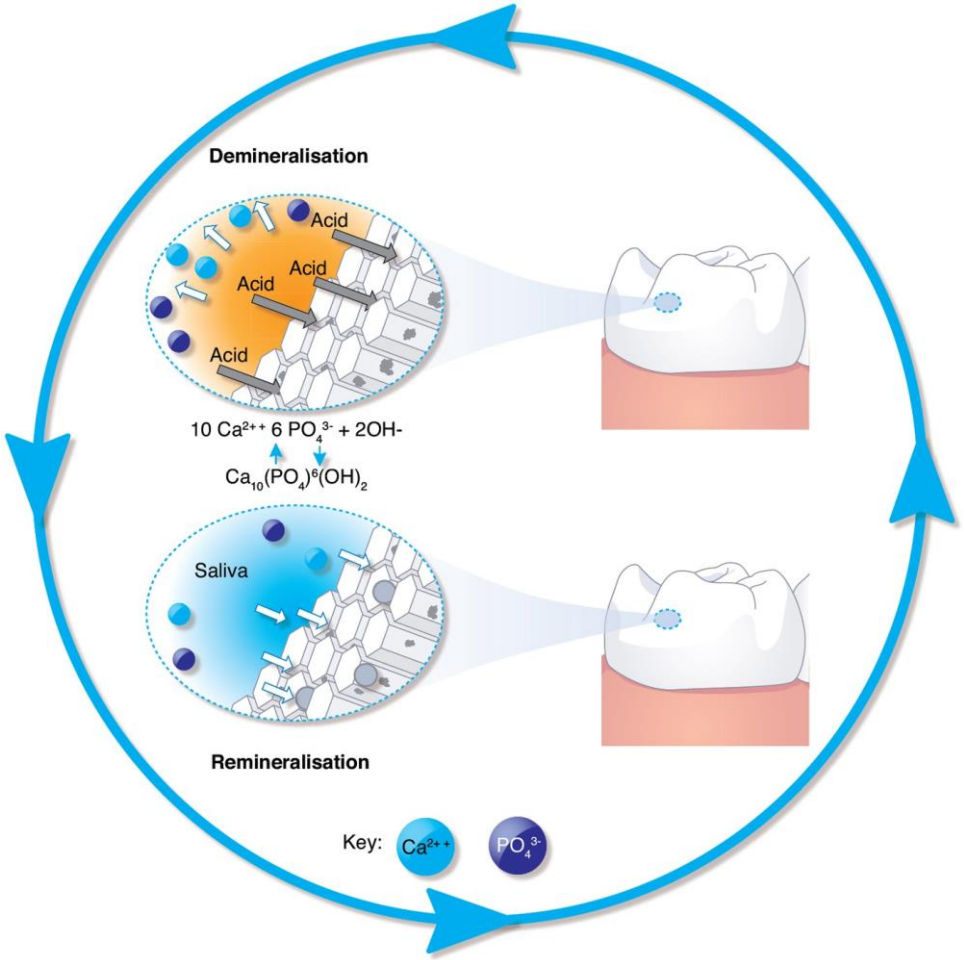
-low buffer capacity

-increased saliva viscosity



Local risk factors

4. Low resistance of enamel to the action of acids, due to the peculiarities of its composition and properties (including incomplete mineralization in the period of eruption of teeth).



Systemic risk factors

1. Low fluoride levels in drinking water (the role of fluorides will be discussed in a separate session)

2. Calcium deficiency (especially due to inadequate dietary intake, known as nutritional deficiency)

3. The presence of systemic chronic diseases, extreme influences on the body, stress

Caries risk assessment

Low Caries Risk

No carious lesions in previous 3 years

Adequately restored dentition

Adequate oral hygiene

Regular dental visits

Diet History:

- Consumes food/beverages less then five times daily
- Chews sugar-free gum
- Avoids sweetened beverages between meals
- Avoids refined sugars and/or fermentable carbohydrates between meals
- Drinks milk or eats cheese every day

Caries risk assessment

Moderate

One carious lesion in previous 3 years

Exposed roots

Fair oral hygiene

Presence of white spots lesions (not fluorosis)

Presence of interproximal radiolucencies (not into dentin)

Irregular dental visits

Orthodontic treatment (planned or in progress)

Diet History:

- Eats food or drinks beverages five or more times daily
- Chews regular (non-sugar-free) gum
- Drinks sweetened beverages between meals
- Eats refined sugars and/or fermentable carbohydrates between meals
- Does not drink milk or eat cheese every day

Caries risk assessment

High

Two carious lesions in previous three years

Previous root caries or numerous exposed roots

Deep pits and fissures

Poor oral hygiene

Frequent sugar intake

Inadequate use of topical fluoride

Irregular dental visits

Inadequate saliva flow

Orthodontic treatment (planned or in progress)

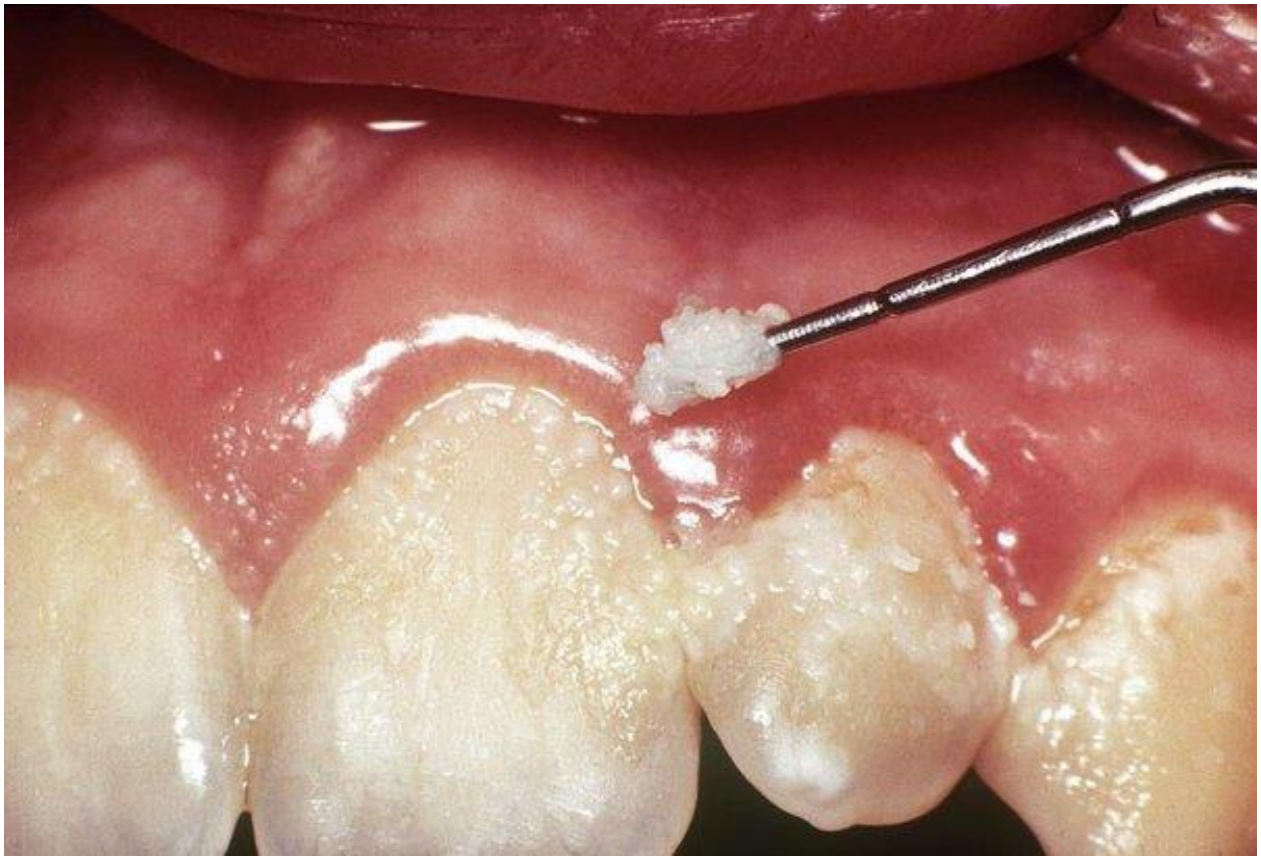
Diet History: (As described in moderate caries risk above)

CAMBRA
Caries Management by Risk Assessment

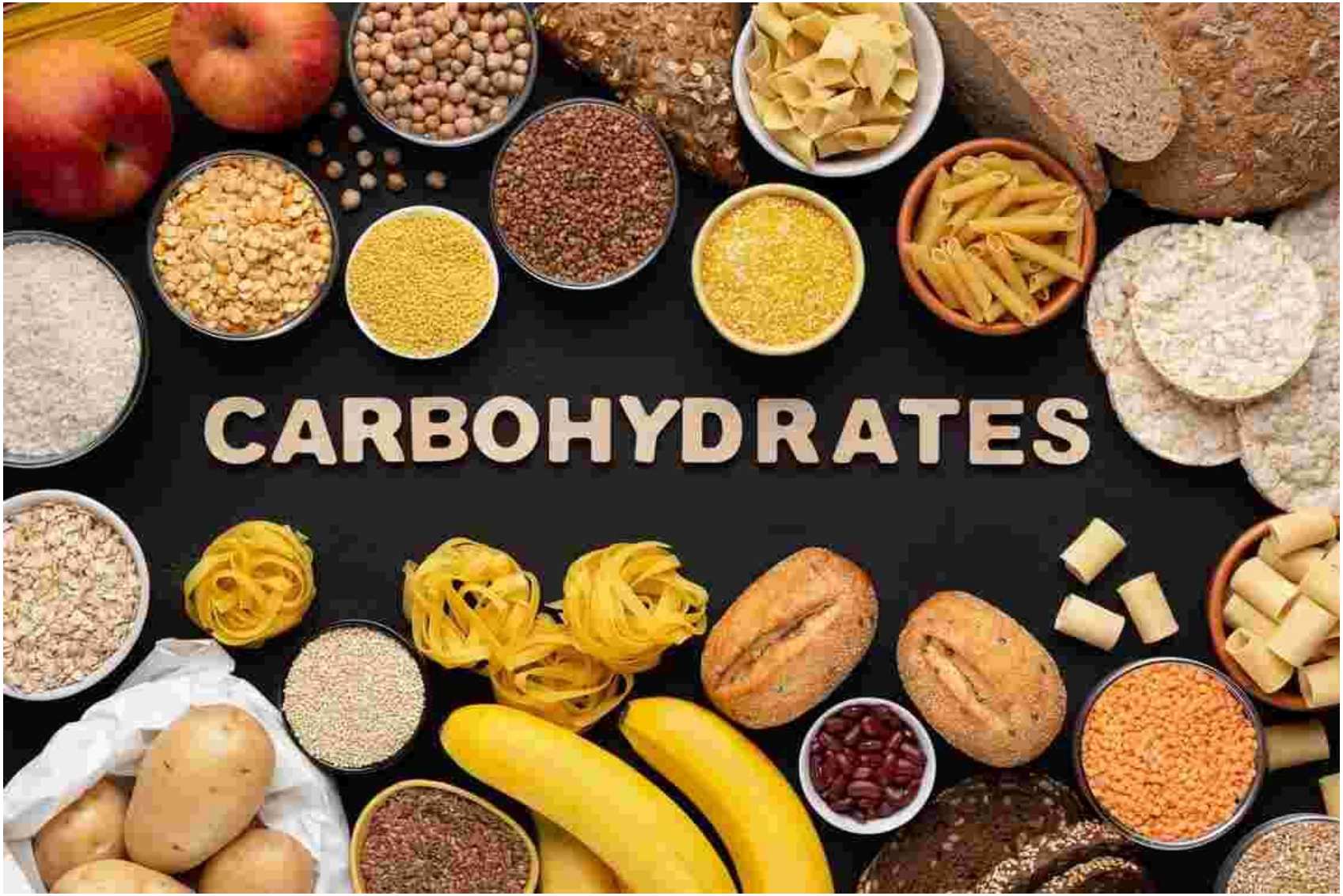
Patient name: Reference number:
Provider name: Date:

Caries risk component			
Disease indicators	Check if Yes		
1. New cavities or lesion(s) into dentin (radiographically)			
2. New white spot lesions on smooth surfaces			
3. New noncavitated lesion(s) in enamel (radiographically)			
4. Existing restorations in last three years (new patient) or the last year (patient of record)			
Biological or environmental risk factors		Check if Yes	
1. Cariogenic bacteria quantity — **not currently available**			
2. Heavy plaque on the teeth			
3. Frequent snacking (> 3 times daily)			
4. Hyposalivatory medications			
5. Reduced salivary function (measured low flow rate)**			
6. Deep pits and fissures			
7. Recreational drug use			
8. Exposed tooth roots			
9. Orthodontic appliances			
Protective factors			Check if Yes
1. Fluoridated water			
2. F toothpaste once a day			
3. F toothpaste 2X daily or more			
4. 5000 ppm F toothpaste			
5. F varnish last six months			
6. 0.05% sodium fluoride mouthrinse daily			
7. 0.12% chlorhexidine gluconate mouthrinse daily seven days monthly			
8. Normal salivary function			
	Column 1	Column 2	Column 3
Final Score: **Yes in Column 1: Indicates high or extreme risk** **Yes in columns 2 and 3: Consider the caries balance** **** Hyposalivation plus high risk factors = extreme risk**			
Final overall caries risk assessment category (check) determined as per guidelines on next page **EXTREME** ☐ **HIGH** ☐ **MODERATE** ☐ **LOW** ☐			

Dental plaque



Carbohydrates



Sugar

INTRINSIC SUGARS - natural sugars that are found inside the cell structure of food.

EXTRINSIC SUGARS are found in food in a free state or added to it.

Caries resistance

Features of the chemical composition of the enamel apatite

Structural features of enamel: completeness of organic matrix, arrangement of crystals and prisms

Anatomical features of the tooth

Condition of organs and systems of the body

Impact of systemic chronic diseases on dental hard tissue health

Diseases and conditions accompanied by reduced salivary flow:

- Endocrine disorders (diabetes mellitus);
- Rheumatoid conditions (Sjögren's syndrome);
- Immune system dysfunctions (HIV);
- Neurological diseases (Parkinson's disease);
- Psychogenic disorders (depression);
- conditions accompanied by dehydration

Prevention of dental diseases in toddler

Risk factors:

- Poor hygienic care of the child's oral cavity

- Improper artificial feeding (position, selection of the pacifier)

- High sugar content in the child's diet, uncontrolled consumption of sugary drinks and juices from a bottle, especially at night

- bad habits (using a pacifier after 12 months of age, sucking on fingers, tongue, and foreign objects)

Prevention of dental diseases in toddler

The dentist's tasks at check-up

- To educate parents on the risk factors of their child's dental disease and the basic methods of preventing it.

- To motivate parents to monitor their child's oral health, bring them to regular dental appointments and follow their child's oral care and nutritional recommendations.

- Teach parents how to brush their child's teeth and monitor their child's dental hygiene regularly.

Algorithm for preventive care in children from 0 to 3 years old at the dentist's office

1. Examine the oral cavity.
2. Determination of the hygiene index value.
3. Surveying the parents about the eating habits of the child (with emphasis on the frequency of sweet foods and drinks).
4. Teaching parents how to brush their child's teeth, using models.
5. Toothbrush and toothpaste recommendations, the necessity to reduce the child's consumption of sweets, and the timely rejection of the dummy (no later than 12 months of age).
6. If necessary, oral hygiene treatment

Oral care recommendations for infants and toddlers

Before teeth erupted, after each feeding the infant should have a gauze wipe to remove food debris from the alveolar ridges and palate.

From the time the baby's first teeth erupt until they are one year old, parents should clean the child's teeth daily, using a very soft silicone brush on the finger.

Oral care recommendations for infants and toddlers

From one year onwards, it is advisable to brush the child's teeth twice a day with a very soft children's toothbrush, from the gum to the incisal edge or on the chewing surface of the teeth.

From the age of 2-2.5 years, the teeth are brushed twice a day using a very soft children's toothbrush and a gel toothpaste for children

Oral care recommendations for infants and toddlers

Nutritional advice for parents:

Give your baby plain water, not sweetened water

Limit sugary juice or other sugary drinks from the bottle

Do not let your baby fall asleep with a bottle

PREVENTING DENTAL DISEASES IN PRESCHOOL CHILDREN

<u>The main risk factors</u> :

- Poor oral hygiene

- Frequent consumption of sugary foods and drinks

- Bad habits

PREVENTING DENTAL DISEASES IN PRESCHOOL CHILDREN

Main tasks of the dentist

- Motivating parents and the child to take good oral hygiene and limit the consumption of sugar

- teaching the parents and child the rules of dental hygiene and monitoring its effectiveness

- prevention and timely treatment of caries of temporary teeth

- identification and elimination of factors contributing to dento-alveolar anomalies

Algorithm for preventive care in preschool children at the dentist's office

1. Examination of the oral cavity.
2. Determination of the hygiene index (Fedorov-Volodkina).
3. Survey of the parents regarding the child's eating habits (with emphasis on the frequency of consuming easily fermentable carbohydrates).
4. Teaching the child and parents how to brush their teeth (on a model and in the mouth).
5. Advice on the choice of toothbrushes and toothpaste, and the need to reduce the child's intake of sweets (no more than 20g of sugar per day).
6. Professional oral hygiene (removal of plaque with rubber caps, cones, brushes and polishing paste).
7. Oral hygiene (including atraumatic restorative treatment with glass ionomer cements).

Recommendations for oral hygiene care

Pre-school children should be brushed twice a day under parental supervision, using a soft toothbrush and children's fluoride toothpaste (500 ppm fluoride). The Fones circular brushing method is the easiest to learn at this age.

Children living in areas with high fluoride levels in drinking water are recommended to use calcium-containing toothpaste for prevention of dental caries.

Dietary guidelines

- The frequency of eating sweets should be reduced
- Preferably eat sweet foods with a main meal, after which they should be brushed or rinsed with water
- If possible, avoid foods that allow sugars to remain in the mouth for long periods of time (Chupa Chups, toffee, chewy marmalade)
- Limit (or avoid) consuming sugary carbonated drinks
- Brush the child's teeth and remove plaque before the sweet celebrations

PREVENTING DENTAL DISEASES IN CHILDREN DURING THE PERIOD OF ERUPTION OF PERMANENT TEETH

Risk factors:

- incomplete mineralisation of the fissures immediately after eruption;

- inadequate cleaning of the fissures of permanent molars, which may be due to the complex anatomical structure of the occlusial surface;

- lack of natural mechanical cleaning of the molar occlusial surface due to the lack of contact with the antagonist tooth.

Algorithm of preventive care for children 6-12 years old in the dental office

1 Examination of the oral cavity.

2. Supervised brushing of the teeth with determination of the hygiene index value (PHP, OHI-S).

3 Survey of the parents or the children themselves on the eating habits of the child (frequency of sweets).

4 Teaching parents or the children themselves how to brush teeth, including those in the teething stage (using models and in the mouth).

5 Advice on the choice of toothbrushes, toothpastes and additional hygiene products.

6. Diagnosis of focal demineralization of enamel (by staining with 2% methylene blue solution or instrumental method).

7. Professional oral hygiene.

8 If the presence of foci of demineralization of enamel - carrying out a course of remineralizing therapy. 9.

9. Fissure evaluation of teeth.

10. Sealing of fissures and pits of permanent teeth, if indicated.

Program of prevention in school

- Measures to improve oral hygiene (supervised brushing and professional oral hygiene);

- Topical application of fluorides;

- Sealing the fissures of permanent molars;

- Motivation and education of parents and children;

- Determination of an individual interval until the next dental visit, the length of which depends on the identified caries risk factors.

Individual oral hygiene

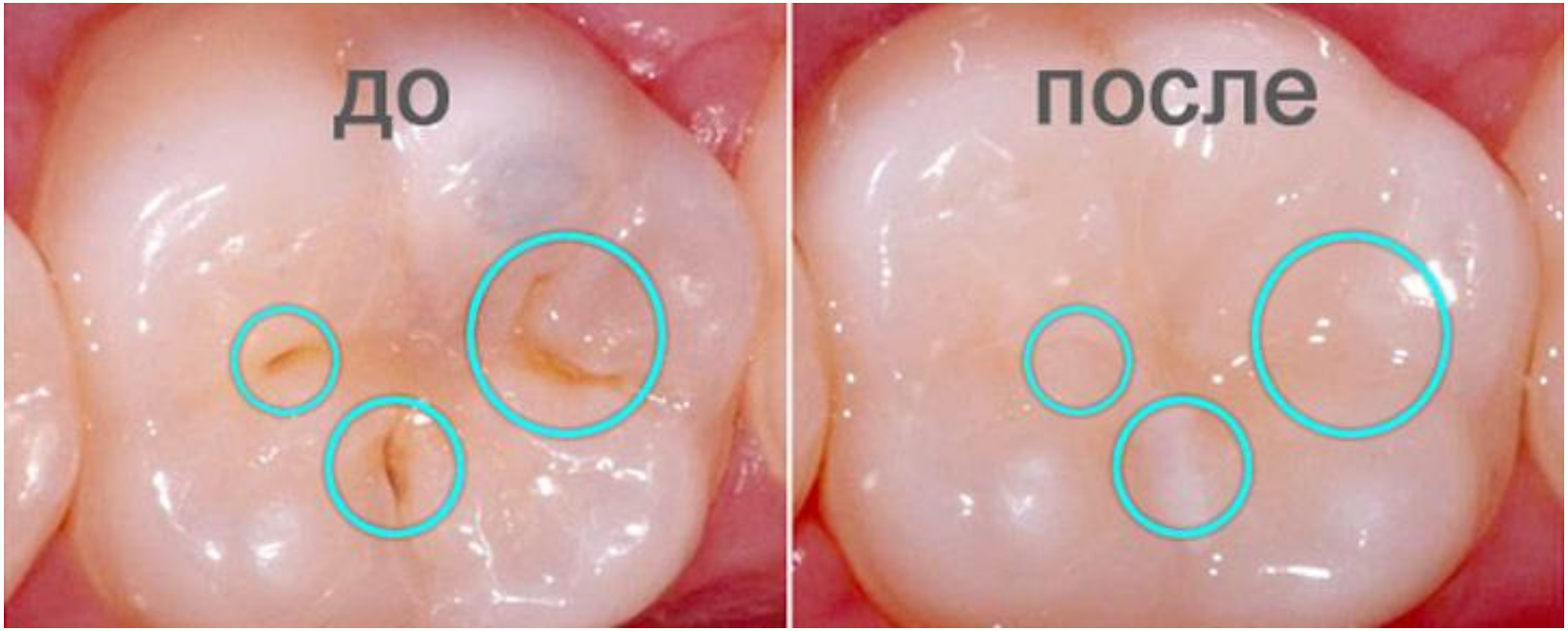
- Identifying plaque by staining and visually demonstrating it to the child;

- Teaching the child (and parents) proper brushing technique;

- Teaching the child (and parents) how to clean a partially erupted first (or second) permanent molar

Recommendations for the selection of oral hygiene products

Fissure sealing



Motivation

1) information about the ultimate goals of the program and the benefits of the program to children's health;

2) Information about the mechanism of caries formation and development;

3) information on the role of plaque and factors that accelerate and delay the development of caries;

4) information about the influence of certain foods, especially sweets, on the development of caries process and tips on rational diet;

5) advice on the use of toothbrushes and pastes;

6) teaching the rules of brushing teeth.

PREVENTION OF DENTAL DISEASES IN CHILDREN AGED 12 YEARS AND OVER

The main risk factors:

- Poor oral hygiene

- High intake of easily fermentable carbohydrates (including fast food and sugary carbonated drinks)

- Bad habits (smoking), certain fashion trends (lip and tongue piercings)

Algorithm for preventive care in children over 12 years of age at the dentist's office

1. Oral examination.

2. Supervised brushing of teeth with hygiene index (Podshadley-Haley, OHI-S).

3. Interviews with the children regarding their eating habits (frequency and consumption of sweets), bad habits (smoking), motivation for a healthy lifestyle.

4. Teaching the rules of brushing teeth using models and in the mouth.

5. Advice on the choice of toothbrushes, toothpaste and additional oral hygiene products.

6. If there is a large amount of plaque, especially in the cervical area - diagnosis of focal demineralization of enamel (by staining with 2% methylene blue solution or by instrumental method).

7. Professional oral hygiene.

8. In the presence of foci of demineralization of enamel - carrying out a course of remineralizing therapy