

Protecting All Children's Teeth

Dental Development

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



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Introduction



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It is important for child health providers to understand normal dental development so that:

- Proper anticipatory guidance can be provided to families.
- Deviations from normal can be recognized.
- Accurate decisions about intervention can be made.

Learner Objectives



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Upon completion of this presentation, participants will be able to:

- Recall the typical pattern and timing of tooth eruption.
- Describe instances in which a practitioner should be concerned about eruption and refer for evaluation.
- List medical causes of premature and delayed tooth exfoliation.
- State at least 4 common etiologies of tooth discoloration.
- Correctly identify symptoms associated with teething and summarize proper teething management.
- Outline common symptoms and causes of malocclusion.

Normal Development



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Oral structures begin to form during the third and fourth weeks of embryonic development.

The teeth begin to develop around the sixth week of fetal life.

Development continues throughout fetal life and beyond.

Tooth Eruption: Primary Teeth

Primary teeth begin to erupt around 6 months of age (range 5-10 months)

Eruption is completed by 24 to 36 months

Delay of more than 12 months merits further dental evaluation



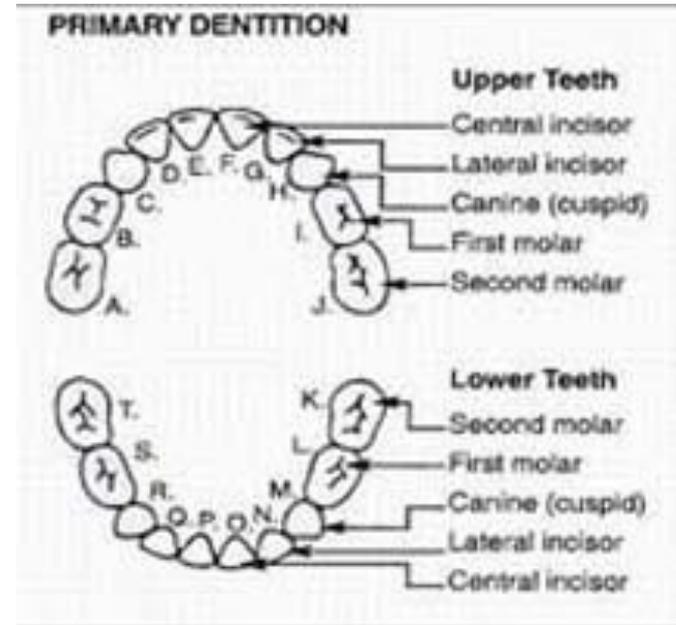
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Tooth Eruption: Primary Teeth

Eruption is usually symmetrical (lower teeth before upper) in the following pattern for primary teeth:

- Central incisors
- Lateral incisors
- First molars
- Canines
- Second molars

Exfoliation often follows a similar pattern.



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Tooth Emergence: Permanent Teeth



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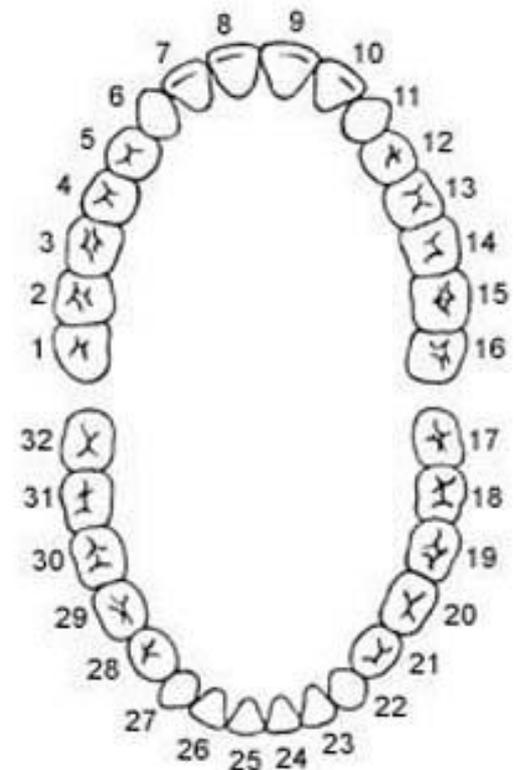
Permanent teeth emergence pattern is similar to that of the primary teeth.

Eruption of the permanent teeth begins between 5 and 7 years of age and usually finishes by 13 to 14 years.

Tooth Emergence: Permanent Teeth

The typical pattern for permanent teeth eruption is:

- Central incisors
- Lateral incisors
- First molars
- Premolars
- Canines
- Second molars
- Third molars (wisdom teeth)



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Natal and Neonatal Teeth



Used with permission from David A. Clark, MD; Chairman and Professor of Pediatrics at Albany Medical Center

Some infants erupt teeth before birth (natal teeth) or shortly thereafter (neonatal teeth).

Generally, no treatment is indicated. Extraction of these incisors may be considered if they are mobile, interfere with breastfeeding, or lead to Riga-Fede ulceration.

Delayed Eruption

Delayed emergence of more than 12 months can be caused by:

- Oral space issues (most common reason for a single tooth)
- Endocrine disorders
- Genetic disorders
- Dense gingival tissue
- Dental infection
- Radiation therapy

It is reasonable to refer a child who has not erupted any teeth by 18 months of age to a dentist if they are not seeing one already.

Early Tooth Loss

Primary tooth exfoliation is a part of the normal process of permanent tooth eruption

- Usually begins around age 6

Early tooth loss may be the result of the following causes:

- Tooth destruction from dental caries
- Trauma
- Endocrine disorders, immune disorders, or other disorders

Dental Caries



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Delayed Exfoliation

Delayed tooth loss can be caused by a variety of disorders, including:

- Endocrine disorders such as hypothyroidism or hypopituitarism
- Ectodermal dysplasia
- Genetic disorders
- Vitamin D resistant rickets

Abnormal Teeth

A number of tooth abnormalities can occur in development.

These abnormalities can relate to the shape, color, physical structure, or number of teeth.

Abnormal Teeth, continued

Hypodontia can be caused by the same problems that delay eruption.

Anodontia is extremely rare and most often associated with hypohydrotic ectodermal dysplasia.

Hyperdontia can be associated with genetic disorders such as cleidocranial dysostosis and Gardner's syndrome (Familial Adenomatous Polyposis).

Tooth Shape

Abnormal tooth shape can result from a variety of medical conditions.

Hutchinson Teeth



Hutchinson incisors and Mulberry teeth are caused by congenital syphilis.

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Tooth Color

Abnormalities in tooth color can result from a number of causes.

Food pigments can stain the teeth, although these changes should be temporary. Smoking can also discolor the teeth.



Excess fluoride intake can cause a range of color changes, from a lacy, chalky white discoloration to severe brown staining of the teeth.

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Tooth Color, continued

Abnormalities in tooth color can also be caused by the following:

- Nerve necrosis secondary to trauma
- Severe caries
- Tetracycline use by a pregnant mother in the second half of pregnancy or by a child early in life
- Oral iron supplementation
- Poor oral hygiene
- Medical problems

Iron Staining



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Teething Care

Teething and symptoms attributed to teething are a common concern of parents.

It is important to inform parents that none of these symptoms consistently and accurately predict when teething is about to occur:

- Congestion or cough
- Sleep disturbance
- Decreased appetite for liquids
- Vomiting
- Loose or increased stools

Teething Care, continued

The recommended intervention for teething is the use of cold items because the cold acts as an anesthetic for the gums.

Suggested items include:

- Pacifiers
- Spoons
- Clean wet washcloths
- Frozen bagels or bananas
- Refrigerated teething rings



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Teething Care, continued

Topical teething gels sold over-the-counter (OTC) are often used for teething.

These gels can carry serious risks, such as local reactions, seizures with overdose, and methemoglobinemia. Benzocaine containing teething gels should not be used in infants or children under 2 years of age.

If necessary, parents should be instructed on proper dosing of OTC analgesic medications, such as acetaminophen or ibuprofen.

Malocclusion

Malocclusion can be a functional problem, an aesthetic issue, or a hindrance to maintaining good oral hygiene.

Examples of malocclusion include anterior open bite, anterior crossbite, and posterior crossbite.

Anterior Open Bite



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Department of Pediatric Dentistry, University of Alabama at
Birmingham

Anterior Crossbite



Used with permission from Martha Ann Keels, DDS, PhD;
Division Head of Duke Pediatric Dentistry, Duke Children's
Hospital

Posterior Crossbite



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Department of Pediatric Dentistry, University of Alabama at
Birmingham

Malocclusion, continued

Signs and symptoms of malocclusion include:

- Abnormal alignment of teeth
- Abnormal appearance of the face
- Difficulty or discomfort when biting or chewing
- Bruxism

Malocclusion, continued

Malocclusion is usually genetic or congenital in origin.

Examples of genetic causes include congenital absence of teeth, cleft lip or palate, skeletal disorders, and muscular problems.

Malocclusion can also result from environmental factors, such as prolonged thumb sucking, pacifier use, or tongue thrusting.

Patients with malocclusions should be referred to a dental professional.



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Question #1

A parent asks you how many "baby teeth" her child will eventually have. What is the most appropriate response?

- A. 18 teeth
- B. 20 teeth
- C. 28 teeth
- D. 32 teeth
- E. None of the above

Answer

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- A. 18 teeth
- B. 20 teeth**
- C. 28 teeth
- D. 32 teeth
- E. None of the above

Question #2

Which of the following is true of malocclusion?

- A. It can be an aesthetic problem
- B. It can interfere with proper oral hygiene
- C. It can make eating difficult
- D. Examples include an anterior open bite and a posterior crossbite
- E. All of the above

Answer

Which of the following is true of malocclusion?

- A. It can be an aesthetic problem
- B. It can interfere with proper oral hygiene
- C. It can make eating difficult
- D. Examples include an anterior open bite and a posterior crossbite
- E. All of the above**

Question #3

You are seeing a 15-month-old healthy boy for his 15-month routine visit. He was not premature. The parents are concerned because he has not yet erupted any teeth, a finding you confirm on examination. Which is the most appropriate course of action?

- A. Reassure the family. If the child appears normal, you are not concerned unless no teeth have erupted by 2 years of age
- B. Refer to a dentist for evaluation
- C. Obtain a panoramic X-ray of the teeth to ensure that they have developed normally
- D. Refer to an endocrinologist for evaluation, as delayed tooth eruption has a known association with several endocrinopathies
- E. Wait 3 months and refer to a dentist if no teeth have erupted by the 18 month routine visit

Answer

You are seeing a 15-month-old healthy boy for his 15-month routine visit. He was not premature. The parents are concerned because he has not yet erupted any teeth, a finding you confirm on examination. Which is the most appropriate course of action?

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Question #4

True or False? Excess fluoride intake can cause irreversible tooth discoloration.

- A. True
- B. False

Answer

True or False? Excess fluoride intake can cause irreversible tooth discoloration.

- A. True
- B. False

Question #5

When do the permanent (adult) teeth begin to erupt?

- A. It varies from child to child
- B. Around 4 years of age
- C. Around 6 years of age
- D. Around 8 years of age
- E. Starting at 10 years of age

Answer

When do the permanent (adult) teeth begin to erupt?

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References

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