

Some of the older children seen by Dr. Tom had malocclusions. Some problems were the result of premature loss of primary teeth due to BBTD. Dr. Tom explained that preventing early tooth loss is important for the health of the child for many reasons, including being able to speak clearly and distinctly, and maintaining sufficient space in the mouth for the permanent teeth.



Malocclusion

Malocclusions that affect oral function require treatment. Many malocclusions, however, involve primarily aesthetic concerns.

Generally, oral health supervision focuses on prevention and treatment of diseases, particularly caries and periodontal disease. Additional concerns include developmental conditions such as craniofacial anomalies (e.g., cleft lip and/or palate) and malocclusions.

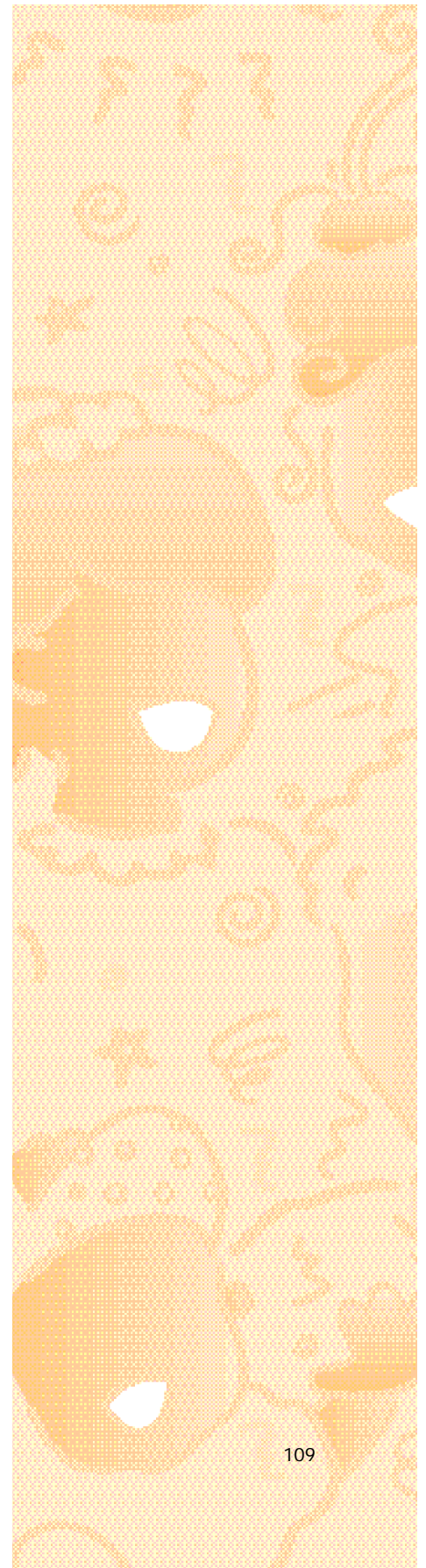
Malocclusion is an improper alignment of the jaws and teeth. *Skeletal malocclusions* occur when either the upper or lower jaw is not properly aligned in relation to the skull or when the upper and lower jaws are not aligned properly. In *dental malocclusions*, the upper and lower teeth are not properly aligned in relation to one another, and crowding of teeth may also occur. Some malocclusions involve both skeletal and dental aspects.

Most malocclusions are genetically determined. Two types of malocclusion can be prevented: premature loss of primary teeth and nonnutritive sucking habits that continue after the permanent teeth erupt. The premature loss of primary teeth can cause malocclusion by reducing the space available for the permanent teeth that follow. If teeth are lost prematurely due to caries or injury, space can be preserved with a device called a space maintainer. Children who habitually suck fingers, thumb, or pacifier should be encouraged to discontinue the habit around age four, before the permanent teeth erupt.

Malocclusion is considered not so much a disease as a *malformation* or variation from the proper alignment of teeth or jaw. Many malocclusions have little impact on oral or general health and may not need treatment to improve function. Some malocclusions, however, can be disfiguring or can affect oral functions such as chewing and speaking. Craniofacial variations and disturbances in the number or form of teeth (e.g., missing teeth, or teeth of unusual size or shape) obviously require treatment. Other malocclusions are treated primarily for aesthetic reasons. Before making a decision about treating malocclusion, families need to carefully consider the risks, benefits, and costs of treating this condition, delaying treatment, or choosing an alternative to treatment. For some children, the enhanced self-image and improvement resulting from correcting malpositioned teeth are important. Because of the costs

involved, justification for treatment should include a clear rationale, and a second opinion may be sought. Dental professionals should provide families with the information they need to help make the decision, put the health benefit of correction into perspective with other life needs, and direct families to additional sources of information.

Orthodontic and/or orthopedic devices can help reposition teeth, alter jaw growth, or both, to achieve better alignment of teeth, jaws, and skull. The most familiar devices are braces attached to the teeth. Orthodontic and orthopedic treatment usually takes months or years and may require additional years of retention to stabilize the teeth in their new relationships. Long-term benefits of orthodontic care include enhanced oral function and self-image.



Dr. Tom visited the WIC office again. The WIC coordinator told Dr. Tom that some babies like to suck even when they are not hungry. Dr. Tom suggested that a pacifier might be a good substitute when the baby has been fed but still seems fussy. Babies who get too many calories can have problems with obesity when they are older. In some villages, the children are already overweight at an early age; one way to prevent this problem is to breastfeed or bottlefeed only when the baby is hungry.

Nonnutritive Sucking Habits

Sucking fingers, thumb, or pacifier is generally not a problem for dental development until the permanent teeth erupt.

Sucking is one of a baby's natural reflexes, and most young children require some amount of additional sucking beyond that needed for nourishment.

For many young children, this type of sucking also provides emotional benefits, allowing the child to calm down and focus attention. This type of sucking can be an important first step in the child's development of self-regulation and the ability to control emotions.

For some children, however, nonnutritive sucking becomes a problem. When sucking occurs frequently and with great intensity, the primary and permanent teeth as well as the jaws may be affected. The primary teeth will often show signs of malposition. As permanent teeth erupt, intensive or prolonged nonnutritive sucking may cause a significant and often permanent malocclusion (open bite), in which a child's upper and lower front teeth cannot be brought together when the jaws are closed.

The dental professional's focus changes during early childhood, from support for the benefits of a safe, nurturing nonnutritive sucking habit to support for weaning at the appropriate time. Weaning from the habit should begin at about age four, so that sucking the thumb or pacifier will have stopped entirely by the time the first permanent teeth erupt. Several approaches, ranging from behavior modification to appliances, have been used successfully to discourage sucking. The dental professional, other health professionals, and the parents need to discuss the most appropriate treatment for each child.

Tobacco Use and Oral Health

Approximately one in every three U.S. adolescents smokes or uses spit tobacco. Tobacco use is destructive to oral health—it damages the oral soft tissues, especially the cheeks and gums, and can lead to oral cancer.

In the United States, approximately one-third of adolescents ages 14–18 smoke or use spit tobacco (chewing tobacco or snuff).¹⁰ Tobacco use can begin as early as age five or six and increases in prevalence throughout early adolescence and into early adulthood. Typically, early stages of tobacco-related damage appear as redness of the oral soft tissues. Over time, the gums and other oral tissues may become white and spongy. Continued irritation lead to cuts or sores in the areas of heaviest exposure. Tobacco use exposes the soft tissues of the mouth to irritants and carcinogens that can cause inflammation, ulceration, and eventually cancer of the mouth, lungs, pharynx, larynx, and esophagus.

Recognizing these hazards, the dental professional needs to educate and inform children and adolescents about the health implications of tobacco use. It is essential to discourage children and adolescents from starting a tobacco habit and to encourage those already using tobacco to stop the habit.

Smoking

The younger a person begins smoking, the greater the risk of developing oral diseases and other conditions related to smoking.

About 3 in 10 high school seniors smoke cigarettes.¹¹ Most adults who are addicted to nicotine were “hooked” on smoking by age 20.¹²

Smokers are more likely than nonsmokers to develop periodontal disease. Smokers also have more tartar, stains on their teeth and tongue, and bad breath. Smoke can irritate mouth tissues and delay healing after oral surgery. Cigarette smoking can also produce a general decrease in physical fitness, increased cough and phlegm production, greater susceptibility to and severity of respiratory illnesses, early development of heart disease, and slower rate of lung growth (which may lead to reduced levels of lung function in adulthood).

For those who smoke, changes in the mucous membrane lining of the oral cavity occur in early stages of oral cancers. Such changes often

In a meeting at the school, Ella and the teachers discussed another important health issue—cigarette smoking and the use of spit tobacco. In the past, tobacco was used for ceremonial purposes in the village. However, Ella and the teachers expressed concern about the increased use of tobacco among the children and youth. Although it is illegal for anyone under 18 years to purchase tobacco products, spit tobacco and cigarettes are being used by preschool and school-age children. In a recent survey, the dental program found that approximately 30 percent of the children in grades 7–12 had used or were currently using spit tobacco. About 16 percent of the children in grades K–6 were also experimenting with tobacco products. Girls as well as boys seemed to be using it. “Peer

pressure is a strong influence on these children,” said Mrs. Robinson, an elementary school teacher. “We need to form a task force and get information from the state and other health agencies to share with the village elders, parents, and community leaders.” The teachers discussed using several different health education curricula on the topic of tobacco and oral cancer, but agreed that the materials needed to be revised to make them more culturally relevant.

go unnoticed because they are seldom painful. These changes should not be ignored, however, because chances for successful treatment are dramatically better when detected and diagnosed early.¹³

Spit Tobacco

Spit tobacco is more addictive than cigarettes, contains cancer-causing agents similar to those in cigarettes, and can damage oral health as well as overall health.

Spit tobacco is used by placing the tobacco directly in the mouth, where oral fluids help transport nicotine and other chemicals into the body. The use of spit tobacco (chewing tobacco or snuff) in the United States has increased during the past two decades. Tobacco companies have stepped up marketing efforts aimed at adolescents to make the product more attractive, even though in most states it is illegal for minors to purchase spit tobacco. Nearly one in five high school males uses spit tobacco, and the age of initiation can often be as young as 7–10 years of age.¹⁴ Spit tobacco use among female college athletes has tripled since 1985.¹⁵ Using one can of snuff a day delivers as much nicotine as 60 cigarettes. Over one-third of spit tobacco users reported having white patches, sores, and gum problems. Even the short-term use of spit tobacco often causes leukoplakia, a white, wrinkled area of oral tissue inside the mouth, which can become cancerous over time. Long-term use greatly increases the risk for developing oral cancers.¹⁶

Injury

Dental injuries can be unintentional or intentional. Education and early intervention are the best ways for health professionals and families to protect children against dental injuries.

Teeth can be fractured, dislocated, or lost from the socket. The jaw and alveolar bone supporting the teeth can also be fractured. At each stage of development, children are more likely to suffer different types of injury. Toddlers are likely to fall and injure their incisors or suffer soft tissue tears, older children can suffer fracture of any incompletely formed permanent incisors, and adolescents are more likely to suffer oral injury resulting from motor vehicle crashes, athletic activities, and substance use. Children of all ages are at risk for child abuse and neglect.

Prevention

Using safety belts, car safety seats, bike helmets, and mouth guards can prevent a significant number of injuries to the head, face, mouth, teeth, oral tissues, and jaws.

Injuries occurring during motor vehicle crashes and falls are a major cause of damage to children's teeth. Parents need to place infants and toddlers in safety seats when traveling in motor vehicles, and all occupants should wear safety belts. In many states, these safety practices are mandated by law.

Families also need to focus on different injury prevention strategies as their children develop. For babies and toddlers, for example, baby gates should be placed at both the top and bottom of the stairs to prevent falls. Baby walkers should not be used because babies can easily fall down stairs and sustain injury.

As children grow and engage in athletic and recreational activities, a well-constructed mouth guard can reduce the chance of oral injury. Several sports require mouth guards, which prevent an estimated 100,000–200,000 oral injuries to football players alone each year. The Academy for Sports Dentistry has suggested that athletes in many other sports would also benefit from the proper use of mouth guards. Mouth guards come in three forms: stock, mouth-formed, and custom-made by

On the last day of his visit to the village, Dr. Tom had lunch at school with Mr. Atkinson, the physical education teacher, to discuss the use of mouth guards. Mr. Atkinson expressed concern about the growing numbers of children and adolescents who seem to be getting mouth injuries while playing sports. He also explained his plan to approach the school board to discuss the possibility of extending the mandatory mouth guard policy to apply not just to athletic teams but to all intramural teams as well. He asked whether Dr. Tom could make mouth guards for the high school intramural teams on his next trip, and suggested using the school colors to encourage the students to wear the mouth guards.

Dr. Tom shared the teacher's concern about the growing number of oral injuries during sports activities, and said he'd be happy to make mouth guards for the students on his next visit.

Today, more than half of the children in the village are caries-free. In speaking with the village council members, Dr. Tom attributed this improvement to the participation and commitment of everyone in the village—council members and families, schools, educators, community health professionals, and dental professionals. The village water supply has been fluoridated for about five years and Dr. Tom has also been placing dental sealants on the children's teeth for several years. Ella has been doing a great job with the weekly fluoride mouthrinse

dentists. Though more expensive, custom-fitted styles are more comfortable, interfere less with vigorous activity, and thus are more likely to be worn.¹⁷ Mouth guards and other protective gear can be used with activities such as skateboarding and in-line skating, in addition to organized sports such as baseball and hockey.

Almost 3 million children in America are reported to be abused or neglected each year.¹⁸ Children of all ages must be considered at risk for child abuse. Dental professionals are likely to see many of these children and should look for signs of child abuse. In 65 percent of physical abuse cases, reported injuries occur to the head, neck, and mouth.¹⁹ All health professionals, including dentists, are required by law in every state to report suspected cases of child abuse and/or neglect. It is important to note that all individuals required to report are immune from all liability, civil or criminal, for making a good faith report.²⁰ Education and early intervention are the best mechanisms to protect children against abuse or neglect.



Trauma Management

The best treatment for an avulsed (knocked out) permanent tooth is immediate reinsertion at the time of injury. If that is not possible, the tooth should be placed in milk and brought with the child to the dentist immediately for reinsertion.

The essentials of oral trauma management vary, depending on whether the injured tooth is primary or permanent. Primary teeth tend to get knocked out, while permanent teeth tend to fracture. Avulsed primary teeth are rarely repositioned because treatment may (or may not) save the baby tooth but might damage the permanent successor. Permanent teeth that have been knocked out from their sockets should be reinserted immediately, if possible. The longer the teeth are out of their sockets, the less likely the probability of long-term healing. If teeth are not reinserted within *two hours*, their roots will start to resorb (dissolve) at some point, even if the teeth are eventually reimplanted. The teeth will then need to be removed for lack of support. If immediate reinsertion is not possible, permanent teeth that have been avulsed should be placed in milk, which acts as a preservative, and transported with the child or adolescent for immediate dental care. (If milk is unavailable, the tooth should be kept moist in water). Treatment includes reinsertion into the socket, stabilization, and medication to prevent the roots from dissolving.

When injuries occur in the oral cavity, the child should be brought to the dentist as soon as possible. For soft tissue tears, tongue lacerations, and puncture wounds, treatment is aimed at stopping any bleeding and preventing infection to the affected area so it can heal. Bone injuries such as a broken jaw will require treatment by a dentist, oral surgeon, or plastic surgeon.

program in the schools and the teachers have been helping with the after-lunch toothbrush program. The involvement of everyone in the village has helped to ensure that the village children will have healthy teeth and gums. The council members thanked Dr. Tom for his good work. He has been coming to their village for about 10 years and is trusted and loved by the community.

Endnotes: Essentials of Oral Health

- 1 King DL. Teething revisited. 1994, May/June. *Pediatric Dentistry* 16(3):179–182.
- 2 Edelstein BL, Douglas CW. 1995, September–October. Dispelling the myth that 50 percent of U.S. schoolchildren have never had a cavity. *Public Health Reports* 110:522–530.
- 3 Brown LJ, Kaste LM, Selwitz RH, Furman LJ. 1996, March. Dental caries and sealant usages in U.S. children, 1988–1991. *Journal of the American Dental Association* 127:335–343.
- 4 O’Sullivan DM, Tinanoff N. 1993, December. Maxillary anterior caries associated with increased caries risk in other primary teeth. *Journal of Dental Research* 72(12):1577–1580.
- 5 O’Sullivan DM, Douglass JM, Champany R, Eberling S, Tetrev S, Tinanoff N. 1994. Dental caries prevalence and treatment among Navajo preschool children. *Journal of Public Health Dentistry* 54:139–144.
- 6 Wendt LK. 1995. On oral health in infants and toddlers. *Swedish Dental Journal* 106 (Suppl.).
- 7 Too much fluoride can cause fluorosis, which occurs when excess systemic fluoride during enamel formation causes discoloration or defects. The most sensitive age for developing fluorosis is 22–26 months, or, at the outer extremes, 18–30 months. To prevent fluorosis, it is critical that the child avoid ingesting excessive fluoride by swallowing toothpaste or by receiving inappropriate fluoride supplements.
- 8 National Research Council. 1989. *Recommended Dietary Allowances* (10th ed., pp. 40–42). Washington, DC: National Academy Press.
- 9 American Academy of Pediatrics, Committee on Nutrition. 1985. *Pediatric Nutrition Handbook* (2nd ed., p. 167). Elk Grove Village, IL: American Academy of Pediatrics.
- 10 U.S. Department of Health and Human Services. 1994. *Preventing Tobacco Use Among Young People: A Report of the Surgeon General*. Atlanta, GA: Centers for Disease Control and Prevention.
- 11 Institute of Medicine, with Lynch BS, Bonnie RJ, eds. 1994. *Growing Up Tobacco Free*. Washington, DC: National Academy Press.
- 12 U.S. Department of Health and Human Services. 1994. *Preventing Tobacco Use Among Young People: A Report of the Surgeon General*. Atlanta, GA: Centers for Disease Control and Prevention.
- 13 American Association for World Health. 1994. *World Health Day Resource Booklet: Oral Health for a Healthy Life*. Washington, DC: American Association for World Health.
- 14 Institute of Medicine, with Lynch BS, Bonnie RJ, eds. 1994. *Growing Up Tobacco Free*. Washington, DC: National Academy Press.
- 15 Anderson WA, Albrecht RR, McKeag DB. 1993, September. *Second Replication of a National Study of the Substance Use and Abuse Habits of College Student-Athletes*. [Final Report presented to the National Collegiate Athletic Association, Overland Park, Kansas. July 30, 1993.]
- 16 American Association for World Health. 1994. *World Health Day Resource Booklet: Oral Health for a Healthy Life*. Washington, DC: American Association for World Health.
- 17 DeYoung AK, Robinson E, Godwin WC. 1994, August. Comparing comfort and wearability: Custom-made vs. self-adapted mouthguards. *Journal of the American Dental Association* 125(8):1112–1118.
- 18 National Center on Child Abuse Prevention Research. 1992, April. Current Trends in Child Abuse Reporting and Fatalities. Chicago, IL: National Committee for the Prevention of Child Abuse.
- 19 Becker DB, Needleman HL, Kotelchuck M. 1978, July. Child abuse and dentistry: Orofacial trauma and its recognition by dentists. *Journal of the American Dental Association* 97(1):24–28.
- 20 Mouden LD, Bross DC. 1995, August. Legal issues affecting dentistry’s role in preventing child abuse and neglect. *Journal of the American Dental Association* 126(8):1173–1180.