

Oral health throughout life



Oral health is a key component of general health and of psychosocial well-being. The mouth is not an isolated system. It is a gateway for microorganisms to enter the body. Oral health is related to 57 Systemic diseases, the most prominent being diabetes and cardiovascular diseases.

It is well-established that oral health needs change throughout different stages of life, with each period presenting its own unique challenges, risk factors, and opportunities for prevention.

Despite the advances achieved in understanding oral diseases, **there are still cavities found in over 50% of children, while gingivitis affects up to 90% of the adult population, and 23% of older adults suffer from edentulism.** These figures highlight the importance of understanding how oral health evolves over time.

Over the years the efforts made in promoting oral health by medical societies, governments, health professionals, and private companies, along with improvements in people's lifestyle and habits, have led to improved oral health and decrease in caries and periodontal diseases. **However, a significant knowledge gap remains: 75% of the global population receives insufficient education on how to achieve and maintain good oral health throughout their lives.**

Maintaining an adequate level of oral hygiene is essential because it impacts oral health which in turn significantly affects many areas of daily life. A healthy mouth allows us to speak, smile, smell, taste, touch, chew, swallow, and express emotions comfortably and confidently, without pain or discomfort. Conversely, poor oral health, can also impact many areas of life in a negative way, including our relationships and self-esteem and overall well-being, causing pain, infections, and even social withdrawal. Thus, oral health is a cornerstone of a fulfilling healthy life.

As we move through the different stages of life, our oral health needs and risks change, requiring tailored approaches to oral hygiene, diet, and preventive care.

Each life stage, from infancy to older age, require specific approaches to oral hygiene, dietary considerations, and preventive care to ensure that our teeth, gums, and mouth remain healthy over our lifetime.

By understanding and addressing these needs, we can promote long-lasting oral health and prevent disease throughout each life stage. Consistent and good daily oral hygiene, healthy behaviors and routine dental check-ups remain essential to maintaining oral health at every age.

In order to portray the concept "throughout life", we will explore how oral health evolves across the lifespan and outline the specific preventive measures and care necessary at each stage.



Infancy & childhood

0/2/12 years

Introduction

Early childhood is a very special time in our lifespan. The newborn infant is at a very dependent and needful stage of its life. It is a time of relatively rapid growth and development of both the body and personality of the child. The oral cavity begins as a poor ecological habitat, with limited bacteria and microorganisms and without teeth, but which fairly rapidly begins to change. Especially, following the eruption of the teeth. The oral biofilm or dental plaque can then begin to form on these new hard surfaces. It is a time where the parent or caretaker must have the necessary knowledge and information to provide the required nurturing environment. Care must be taken to foster a healthy environment of the oral cavity, first by taking care of difficult phase of tooth eruption and then by ensuring that good habits of oral hygiene care are initiated. Primary prevention of the major dental diseases is the focus of this period of life; along with the prevention of traumatic injuries or early management of growth and developmental issues. *Good care and prevention at this stage are essential to ensure that the child enters the further stages of life with healthy oral tissues and a healthy basis for good oral habits.*

Tooth eruption

The appearance of the first tooth occurs normally during the first 6-8 months of the child's life. A total of 20 teeth should complete the child's dentition by the age of three. An earlier or later appearance of teeth is not necessarily a sign of any problems but just due to individual (genetic) differences between individuals. The lack of appearance of any teeth by the 12th month of life is a sign to consult an oral health professional.

When the primary teeth start erupting it is normal for the child to have:

- Red and swollen gums
- Increased quantity of saliva

- Anxiety and grumbling
- A change in eating habits
- Lack of appetite
- Difficulty in sleeping

In order to relieve the baby from these discomforts, their mouth must be cleaned 2-3 times/day with a wet gauze and should be given cold objects -that are manufactured especially for this purpose- or a cold clean cloth to bite on.

Generally, the symptoms that are observed during tooth eruption are mild. However, the presence of a fever, rashes, vomiting or diarrhea, call for a visit to the pediatrician, since something unrelated to the teeth, is happening.

Pacifiers

Babies have an intense instinct of sucking which is satisfied by the child by using its fingers or other objects. The pacifier is one such important and common means for fulfilling this need of the child. Moreover, a pacifier prevents the habit of finger sucking which causes serious consequences on the development of the jaws. It is preferable to use pacifiers instead of fingers because such external products are more easily stopped at a younger age and minimizing possible harms. Normally, this sucking habit should be stopped before the age of 4. Continuing the habit at older ages could lead to deformities of the jaw that require more difficult therapies by specialists.

First visit to the dentist

According to the European Academy of Paediatric Dentistry the first visit to dentist should be when a child's first tooth erupts. Dentists, either a general practitioner or one specialized for young children's oral health, can provide useful information and a complete preventive dental program to follow including advice concerning nutrition and dietary habits, as well as ways to avoid possible future problems.

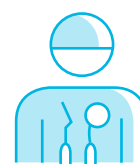
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More than 600 million children worldwide are affected by early childhood caries



The second visit should take place when the child is 2,5 - 3 years old, when all primary teeth are usually present in the mouth. At this time, the teeth are checked for any developmental problems or presence of tooth decay. A proper preventive dental program tailored to the needs of the child can be proposed, based on a caries risk assessment and topical fluoride treatment can be performed. Regular check-ups are suggested for 1-2 times per year, with adjustments to the preventive program and provision of fluoride treatment as needed.

Dental caries

According to the Alliance for a Cavity-Free Future, caries is the most common Non-Communicable Disease (NCD) which has the largest impact on oral health. A Global Burden of Disease Study puts untreated Cavities at No.1 for Adults and No.6 for Children among all diseases. A total of 2.3 billion people has untreated cavities in permanent teeth, and more importantly over 530 million children suffer from untreated cavities of the primary teeth.

More than 600 million children worldwide are affected by early childhood caries (ECC). In general, studies report that approximately 50% of children have one or more decayed primary teeth by the end of toddler age, but these teeth play a pivotal role in the future eruption of the permanent teeth as well as aesthetic development of the face. Losing them early may open the way to avoidable orthodontic problems. According to the American Academy of Pediatric Dentistry, early childhood caries (ECC) is defined as “the presence of 1 or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth” in children. This high caries prevalence can be caused by high frequency or unchecked bottle feeding with sugar-containing drinks/ foods and/or breastfeeding. Additionally, snacks in between meals and all drinks

or beverages containing carbohydrates increase an individual’s risk of caries.

Especially, the first permanent molar, which erupts around the 6th year, is undeniably the key tooth for chewing and plays a crucial role in achieving a healthy dentition. A cavity can form quickly in this molar, sometimes advancing from an early stage to a pulp exposure within just six months. If a child loses their first permanent molar, it can cause changes in their dental arches that may affect them for life. Without proper intervention, these changes can lead to reduced function, shifting of adjacent teeth, and ongoing eruption of the opposing teeth.

Therefore, special care must be given to identify this tooth and prevent disease that may have repercussions throughout life.

Oral hygiene and fluoride

Toothbrushing is an essential part of ensuring good oral health and should begin as soon as the first tooth appears in the mouth. For all age groups, it is advised to be performed 2 times a day. Initially by the parent or caregiver and as the child grows older by themselves, but always under supervision until they can adequately brush by themselves. Both powered and manual toothbrushes are considered to be efficient in cleaning the teeth and removing dental plaque. Brushes should be replaced every 3-4 months.

Fluoride is an integral part of caries prevention, but also in their non-restorative management. Concern of the use of fluoride has mainly centred on the risk of developing dental fluorosis, which is attributable to the use, and possible ingestion, of higher amounts of fluoride primarily at a young age during the formation of the permanent teeth. Toothpaste is the main fluoride product available and used and which could lead to some problems due to ingestion when used. Therefore, there is a need to follow certain recommendations in young

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children to avoid any complications. According to the updated guidelines for the use of fluoride in children, the suggested concentration is 1000ppm of fluoride (F) up to the age of 6yrs, using only an amount equal to a grain of rice up to 2 years and then between 2-6 years equal to the size of a pea. Above the age of 6 years an adult toothpaste with 1450ppm F is recommended. Again, supervision of the child is necessary when he or she begins to brush the teeth, and even checked on up to adolescence, since they lack the necessary skills to adequately perform oral hygiene and must develop them. As a good clinical practice, it is suggested that the excess toothpaste is spat out but without necessarily rinsing with water.

Dental trauma

Traumatic Dental Injuries (TDI) are common occurrences. Oral injuries are reported to be the most frequent during the first 10 years of life and in preschool children make up as much as 17% of all bodily injuries. Prevention of these, especially due to falls, are important for the protection of the teeth. The American Academy of Pediatrics (AAP) recommends childproofing the home. Use of walkers are to be discouraged for safety and developmental reasons. Young children should be closely supervised, and adults supervising children should always be aware of the fall risks that can lead to head injuries. The use of trampolines should be discouraged while outdoor sports and activities should include appropriate safety measures (i.e. helmets and mouthguards where appropriate). Familiarity with safety measures should begin at a young age as for them to become accustomed to their use in later life as well. As they grow older, children should be made aware of possible risks and provided with basic knowledge of what to do when a traumatic injury occurs. Finally, an early evaluation of

the occlusion and position of teeth should be performed by the dentist.

First Orthodontic Evaluation

The American Association of Orthodontists recommends that children have their initial orthodontic evaluation by age seven. At this age, there is a combination of baby and permanent teeth, allowing an orthodontist to identify potential issues early on. At this age, some permanent front teeth and the first set of molars, known as the six-year molars are present allowing an orthodontist to assess how the child’s bite is likely to develop. If any issues are detected, phase one orthodontic treatments can be recommended, also referred to as interceptive orthodontics. The purpose of early evaluations is to address any growth, development, or eruption issues while the child’s teeth and jawbones are still adaptable to treatment, leading to quicker results. Children who undergo phase one procedures might eventually need braces or other orthodontic appliances, but subsequent treatments are generally shorter, less complex, and more affordable.

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Adolescence & teenage years 13/19 years

Introduction

Adolescence and teenage years are a crucial developmental period marked by significant physical, emotional, cognitive, and social changes of an individual. They also bring about significant changes in terms of oral health, as this is a time of growth, development, and increased autonomy which can impact the mouth. These youngsters are becoming independent in their food choices, and their diets may include sugary snacks, soft drinks, and fast food—foods that are more likely to cause tooth decay. The consumption of sugary drinks and snacks, especially those consumed frequently throughout the day, can significantly increase the risk of cavities and enamel erosion. At the same time, as teens become more independent, some may neglect proper oral hygiene practices. Busy schedules, peer pressure, and distractions can lead to irregular brushing and flossing, increasing the risk of plaque buildup, gum disease, and cavities. Peer behaviors and lifestyle choices, such as smoking or using oral tobacco products, impact oral health. Cigarette smoking and vaping can lead to gum disease, bad breath, and tooth staining. As they continue to grow so do the jaw and facial bones, some teenagers may require orthodontic treatment to correct bite issues, such as overbites, underbites, or overcrowded teeth. This is a common time for braces or other orthodontic appliances to be used. They may experience gum problems, including gingivitis (early-stage gum disease), which can cause gums to become red, swollen, and bleed easily. Poor oral hygiene habits, hormonal changes, or certain medications (like birth control) can contribute to these issues. Those that participate in sports or physical activities are at higher risk for mouth injuries, including chipped teeth, broken teeth, or even tooth loss.

Adolescence is a critical time for establishing lifelong habits of good oral hygiene, seeking dental care when necessary and continue to have

regular dental check-ups. Maintaining a healthy mouth during these years sets the foundation for long-term dental health into adulthood.

Dental caries

Overall, more than half of those aged 12 to 19 years have dental caries (57%); however, the prevalence increases significantly from the ages of 12 to 15 years to the ages of 16 to 19 (48% to 66%, respectively). In Europe, a meta-analysis of caries prevalence studies suggested that 77% of the adolescents were affected by caries, with a significantly higher caries prevalence in 16–19-year-old group. Moreover, this last large analysis showed that, as a mean, there were almost 6 diseased surface (DMFS score) per individual. The disease burden for caries can be considered to be high, necessitating effective interventions. The consumption of sugary drinks and snacks, especially those consumed frequently throughout the day, can significantly increase the risk of cavities.

Periodontal disease

Severe gum disease is rare among children and adolescents. Data from 1988 to 1991 in the USA showed that only 2% of adolescents aged 13 to 17 experienced any form of periodontitis classified as at least “mild” (indicating a periodontal attachment loss of 3 mm or more). However, this same age group had the highest rate of gingival bleeding across all age categories, at 73%. Supporting these findings, a 2018 study in Puerto Rico reported that 83% of 12-year-old schoolchildren exhibited gingivitis, defined as bleeding upon probing. Globally, plaque-induced gingivitis described by bleeding on gentle probing as well as the acquisition of calculus deposits have been identified as affecting the majority of adolescent cohorts. Higher levels of gingival bleeding are also linked to hormonal changes present in this age group which heightens

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Consumption of sugary drinks and snacks, can significantly increase the risk of cavities



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The average brushing duration is often insufficient



their sensitivity to the plaque bacteria. This condition could lead to more severe forms of periodontal disease later in life; for this reason, early management, and treatment, if necessary, is of utmost importance for the sake of primary prevention of periodontitis.

Oral hygiene

Daily removal of supragingival dental plaque is essential for preventing caries, gingivitis, and periodontitis. Effective control of bacterial plaque requires proper brushing and flossing techniques to mechanically eliminate biofilm. As already mentioned, for all age groups it should be performed 2 times a day for at least 2 minutes and once a day thorough interdental cleaning with floss or other approved aids (e.g. interdental brushes). Additionally, it must be pointed out that the use of toothpaste with 1450 ppm of fluoride is an integral ingredient. However, studies show that the average brushing duration is often insufficient for effective cleaning and only 2–10% of patients use dental floss regularly and correctly. Additionally, even with education and motivation about proper oral hygiene, patient compliance tends to decrease over time. All the more reason that patients should present for regular dental check-ups.

Tooth erosion

Erosive tooth wear is a modern problem seen to be evolving in the younger generation. The prevalence of tooth erosion in children has been reported to range from 10% to over 80% (studies on children have shown a direct correlation between consumption of carbonated drinks, fruit juices and dental erosion with acidic drinks and food being reported as the most important extrinsic factor contributing to dental erosion. The dramatic increase in consumption of acidic fruit juices, fruit drinks and carbonated beverages is considered to be the

leading cause of dental erosion observed among children and adolescents.

Eating disorders. Moreover, intrinsic acids from the stomach can also have a detrimental effect on the hard tissues of the teeth. According to the National Eating Disorders Association (USA), studies have found that up to 89 percent of bulimic patients have signs of tooth erosion. A recent meta-analysis found that 54.4% of patients with bulimia nervosa and 26.7% with anorexia nervosa experienced tooth erosion.

Dental trauma

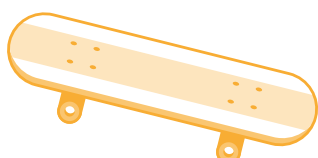
The prevalence of fractures in permanent incisors among U.S. adolescents has been found to be 18% among those aged 12 to 15 years, and 22% among those aged 16 to 19. Young men generally experience more trauma than women. In a retrospective study in Vienna, out of 1,132 teeth in 571 patients with Traumatic Dental Injuries (TDI's) the most frequently damaged teeth were the upper incisors (63.5%) with fractures the most common type of injury.

The use of protective equipment on roads (helmets) and sports activities (i.e. sports mouthguards) are of essential importance to prevent injuries to the head, and specifically to teeth. There are many situations that may increase the risk of TDI's. Performing stunts on bikes, skates, and other activities, are high risk behaviours and participation in these activities must be identified so that these youngsters can be counselled to take appropriate safety precautions. Evaluation and management of the occlusion and position of the teeth are likely to reduce the risk of TDI in this age group. The possibility that these traumatic injuries could be a result of interpersonal violence (i.e. domestic or societal youth violence) or the use of alcohol and/or illicit drugs should always be considered and may necessitate some form of further (official) action.

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Piercingss

Piercings in the oral cavity can cause many problems locally in the oral cavity or on the general health of an individual as well. Apart from affecting speech, chewing or swallowing, piercings can also lead to several other complications. The mouth is a warm, moist environment filled with bacteria, making it a prime location for infections, which if not treated promptly can even become life-threatening. In some cases, a tongue piercing can cause swelling, which may block the airway. Piercings can also damage the gums, teeth, and fillings. A common habit of biting or playing with the piercing can injure the gums and result in cracked, scratched, or sensitive teeth, as well as potentially damaging dental fillings. There is also the risk of hypersensitivity to metals, which may lead to allergic reactions at the piercing site. Additionally, nerve damage can occur, leading to a numb tongue, which is often temporary but can sometimes be permanent. This damage may affect taste sensation and mouth movement, and injury to the tongue's blood vessels can cause serious blood loss. A tongue piercing may also increase saliva production, resulting in excessive drooling. Finally, the jewelry can obstruct dental procedures, such as X-rays, making it more difficult for dentists to assess oral health.

TDI's can also be attributed to oral piercings, with problems being observed in 26% of patients with lip piercings and 46% of patients with tongue piercings. The American Association of Pediatric Dentistry (AAPD) opposes the practice of piercing any intra-oral and peri-oral tissues due to evidence of soft and hard tissue damage caused by them.

Smoking, vaping and other tobacco products

Among people aged 15 years and over, the share of daily smokers in the EU in 2019 ranged from 6.4 % in Sweden to 28.7 % in

Bulgaria. while 5.9 % of the EU population aged 15 years and over consumed at least 20 cigarettes per day, and 12.6 % consumed less than 20 (EuroStat)

Assessing the impact of tobacco use on adolescent oral health can be challenging, but regular use, as well as occasional use, can lead to various problems. These include stained teeth, recessions of the gums, periodontitis, bad breath, dental caries, tooth fractures, and leukoplakia. These issues are associated with all forms of tobacco products, including e-cigarettes.

Smokeless tobacco is also popular in young people in various regions. There are two main types: chewing tobacco and snus. The ingredients in smokeless tobacco are a mixture of tobacco-nicotine, sugar, salt, slaked lime, spices and flavorings. Hundreds of chemicals and poisons may be released when using them. Mouth cancer is the most serious health risk linked with smokeless tobacco. This is due to the large amount of cancer-causing chemicals it contains. Over time, having these poisons released in the mouth could make one four times as likely to get mouth cancer. Smokeless tobacco users are especially likely to get throat cancer, as they regularly swallow tobacco juice. Cancers of the lip and cheek are also common, as the tobacco is pressed against the lining of the mouth.

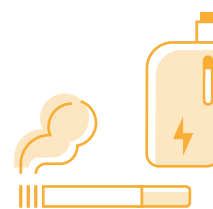
Regular Checkups and Preventive Care

During adolescence, regular dental visits become even more important. Caries risk and gum health need to be monitored closely. Dentists can also provide advice on maintaining oral hygiene and preventing future problems. Fluoride treatments, dental sealants, and other preventive measures can help reduce the risk of cavities and protect developing teeth, especially for teens who may be more prone to decay due to diet or inconsistent oral care habits.

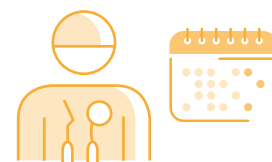
Piercings in the oral cavity can cause many problem and can lead to several general health complications



Stained teeth, recessions of the gums, periodontitis, bad breath, dental caries, tooth fractures, and leukoplakia are associated with all forms of tobacco products, including e-cigarettes



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Adulthood 20/59 years

Introduction

Adulthood (ages 20–59) is a critical period for maintaining oral health, as the mouth undergoes several changes influenced by aging, lifestyle, and systemic factors. Early adulthood (20–39) often sees issues like gingivitis tied to habits such as inadequate oral care, diet and smoking, while middle age (40–59) brings a higher risk of advanced periodontal diseases like periodontitis, often linked to age, genetics, and chronic conditions, like diabetes. Consistent appropriate oral hygiene, a healthy lifestyle, and professional care are essential to prevent complications, like tooth loss, and preserve overall well-being.

Early adulthood (ages 20–39) is a formative period marked by transitions in lifestyle, responsibilities, and health behaviors. It can be divided into two subgroups: young adults (20–25) and adults (25–39). Young adults often face financial challenges, unstable living situations, and limited access to consistent healthcare, with a tendency to neglect preventive care. In contrast, adults aged 25–39 are generally more established and health-conscious, particularly those with higher education. These differences highlight the need for tailored health strategies to address the unique needs of each group.

Middle age (ages 40–59) is a period of significant physiological and lifestyle changes that influence overall and oral health. Aging, genetics, and lifestyle choices contribute to early signs of senescence, including conditions like osteopenia, arthritis, and sensory decline. Comorbidities such as cardiovascular disease, diabetes, and certain cancers become more common, underscoring the importance of health screenings for early detection and intervention.

Oral health risks, particularly severe periodontal diseases like periodontitis,

increase due to cumulative effects of systemic diseases, hormonal changes, stress, and age-related immune decline. Hormonal shifts linked to menopause and andropause also heighten risks by affecting bone density, inflammation, and tissue fragility. Growing health awareness in some socioeconomic groups, particularly among women, highlights the value of preventive care and early management during this critical stage.

In summary, adults aged 20–39 often face health challenges linked to lifestyle habits and limited preventive care, while those aged 40–59 experience more pronounced effects of aging, including systemic conditions and higher risks of severe periodontal diseases due to hormonal and immune changes.

Dental caries

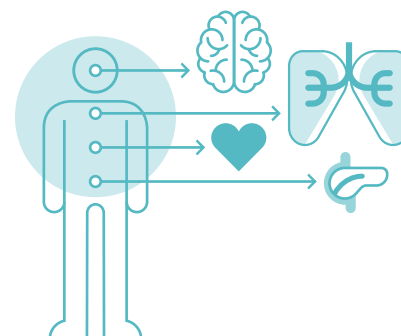
Dental caries remains a significant public health concern among adults aged 20–59, with prevalence rates ranging from 40% to 90% across populations. The condition is influenced by dietary habits, oral hygiene practices, and socioeconomic status. Frequent sugar consumption, a primary risk factor, supports acid-producing bacteria that demineralize enamel. To combat this, reducing sugar intake and incorporating xylitol-based products can inhibit bacterial activity, slow plaque formation, and enhance remineralization.

For individuals with limited access to dental care, the use of at-home fluoride applications (e.g., fluoridated toothpaste or mouth rinses) and professionally applied topical fluorides during dental visits are effective measures to strengthen enamel and prevent caries progression. Sealants are also beneficial, particularly for protecting pits and fissures in molars from decay. Chlorhexidine, used as a rinse or varnish, is effective for high-risk patients in reducing caries lesions.

Adults aged 20/39 often face health challenges linked to lifestyle habits and limited preventive care.



Adults aged 40/59 experience more pronounced effects of aging, including systemic conditions and higher risks of severe periodontal diseases due to hormonal and immune changes.



Dental caries remains a significant public health concern among adults aged 20–59



Neglecting regular dental visits exacerbates caries progression, underscoring the importance of routine check-ups and professional cleanings for early detection and management. In middle-aged adults, the correlation between advanced caries and periodontitis highlights the need for integrated care strategies that address both conditions, such as scaling and root planning for periodontal health alongside caries prevention.

Educational initiatives promoting consistent oral hygiene, balanced diets, and the use of preventive interventions like fluoride and sealants are critical. These measures, combined with routine professional care, can significantly reduce the burden of dental caries in adults.

Erosive tooth wear affects 20–40% of adults and is primarily caused by the chemical dissolution of tooth structure from dietary acids



Erosive tooth wear (ETW)

Erosive tooth wear (ETW) affects 20–40% of adults and is primarily caused by the chemical dissolution of tooth structure from dietary acids (e.g., citrus fruits, sodas, energy drinks) and conditions like gastroesophageal reflux disease (GERD) or frequent vomiting. These factors weaken and reduce enamel tooth surface, leading to tooth sensitivity, functional impairments, and an increased risk of cavities.

Preventive measures include dietary modifications, such as reducing acidic food and beverage intake, and managing GERD or other contributing health conditions. Strengthening enamel with fluoride treatments (e.g., topical applications or toothpaste) and practicing gentle oral hygiene techniques are also essential.

For existing damage, early intervention through restorative procedures can address erosion, improve functionality, and preserve aesthetics. Regular dental assessments are critical for identifying ETW early and implementing tailored preventive and restorative strategies.

Periodontal Diseases and Lesions

Gingivitis and periodontitis are common periodontal diseases, with severe conditions affecting about 19% of the global adult population, totalling over 1 billion cases worldwide.

Gingivitis affects up to 90% of adults, causing gum inflammation that can progress to periodontitis if untreated. Preventive measures include regular brushing and flossing, professional cleanings, and the use of antimicrobial mouth rinses to reduce plaque and inflammation.

Periodontitis, a chronic non-communicable disease (NCD), affects approximately 50% of adults aged 30+, with severe cases impacting 11.2% of the world's population, representing the sixth most common human disease. Moderate to severe periodontitis affects 10-15% of the global population, and 50% of adults aged 30+ have some form of periodontal disease. Tooth loss due to periodontitis impairs speech, mastication, and psychosocial well-being, with an annual global productivity loss estimated at \$54 billion. Early intervention through scaling and root planing can prevent disease progression, while advanced cases may require surgical treatments, such as periodontal flap surgery or regenerative procedures.

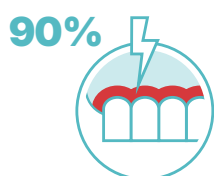
Halitosis

Halitosis, often linked to periodontal disease, can be managed by treating underlying gum issues, improving oral hygiene and using tongue scrapers or antimicrobial rinses. Regular dental visits help diagnose and effectively address persistent bad breath.

Gingival Recession (GR)

Recent reviews have provided figures of 78% pooled prevalence for GR in adults.

Gingivitis affects up to 90% of adults, and can progress to periodontitis



Common causes include inadequate oral hygiene and/or aggressive tooth brushing, periodontal disease, and anatomical factors such as thin gingival biotype. Gingival recessions are often associated with interproximal (between the teeth) clinical loss of attachment which could compromise surgical procedures for complete root coverage. The consequences of GR extend beyond aesthetic concerns, often leading to increased tooth sensitivity and a higher susceptibility to root caries. Effective prevention and management strategies include proper oral hygiene, regular dental check-ups, and professional cleanings.

For severe cases, surgical options like connective tissue grafts or advanced periodontal plastic surgery can restore gingival tissue, enhance aesthetics, and protect exposed roots.

In summary, comprehensive periodontal care—including routine dental check-ups, education on proper oral hygiene, and timely professional intervention—is essential for preventing and managing these conditions, improving both oral health and quality of life.

Dentin Hypersensitivity (DH) due to Periodontal Recession

Dentin hypersensitivity (DH) is a common issue among adults aged 20–59, significantly affecting quality of life. Periodontal recession exposes the root dentin, increasing sensitivity to stimuli such as temperature changes and acidic foods. Recent reviews estimate that 11.5% of adults experience DH, with 75.9% of participants in a recent study showing at least mild sensitivity, and 29% experiencing more severe symptoms. Causes of DH include poor oral hygiene, a thin gingival phenotype, aggressive brushing, and untreated gingivitis. Improving oral hygiene practices with gentle brushing techniques, addressing gingivitis with appropriate treatment, and preventing further recession by avoiding

trauma to the gums. Systematic reviews confirm that DH negatively affects oral health-related quality of life (OHRQoL), but this can improve with treatment.

Treatment options for DH include using toothpastes containing potassium, stannous fluoride, calcium sodium phosphosilicate, arginine, or nano-hydroxyapatite, which have been shown to relieve symptoms with consistent use. For more severe cases, surgical root coverage is an effective intervention for its management.

Summary: Proper management of periodontal recessions and DH is critical in preventing hypersensitivity, enhancing oral health-related quality of life, and maintaining long-term oral health. Regular dental visits, combined with appropriate treatments and preventive measures, can significantly improve patient outcomes.

Tooth Malposition and Orthodontic Treatment and Its Impact on Oral and Periodontal Health

Orthodontic treatment in adults, involving either fixed appliances or clear aligners, significantly influences oral and periodontal health outcomes. A relationship exists between malocclusion and the presence of periodontal disease in patients seeking orthodontic treatment. Fixed appliances, while effective in moving teeth, can complicate oral hygiene due to the difficulty of cleaning around the brackets and wires. Emphasizing the importance of diligent oral hygiene with specialized tools, such as end-tuft brushes and interdental brushes, which can help reduce plaque accumulation around fixed appliances.

Clear aligners, on the other hand, offer an advantage for oral hygiene because they are removable, allowing for regular brushing and flossing. Clear aligners seem to promote easier plaque control and reduce the risk of gingivitis and periodontal issues during treatment.

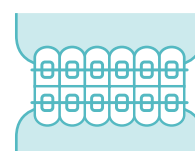
Gingival Recession causes include inadequate oral hygiene and/or aggressive tooth brushing, periodontal disease, and anatomical factors such as thin gingival biotype



Dentin Hypersensitivity is a common issue among adults aged 20–59



Appropriate orthodontic treatment, coupled with effective oral hygiene practices and patient education, is key to improving both functional and periodontal health outcomes.



Tooth loss can result in decreased masticatory efficiency, altered speech, and negative psychosocial effects



Nevertheless, both treatment methods, when managed properly, are considered to have a comparable impact on periodontal health. Regardless of the orthodontic approach, it is critical to educate patients on maintaining optimal oral hygiene, including the use of scientifically endorsed products such as fluoride toothpaste, antimicrobial mouth rinses, and remineralizing agents to protect the enamel and prevent caries. Regular dental check-ups and professional cleanings during and after treatment are essential for monitoring and maintaining periodontal health.

hygiene with specialized brushes and interdental cleaners is essential to avoid plaque buildup around fixed restorations. Routine check-ups are crucial to ensure the prostheses remain functional and that underlying periodontal health is maintained.

Implant-supported prostheses are also an effective long-term solution for replacing missing teeth, but improper placement or lack of proper care can lead to peri-implantitis or implant failure. Proper surgical planning and technique, combined with post-operative care, including plaque control and regular professional cleanings, are essential to ensure the success and longevity of implants. Moreover, the use of antimicrobial mouth rinses and appropriate brushing techniques can reduce the risk of peri-implant diseases.

In summary, choosing the right prosthetic option based on individual needs, combined with proper oral hygiene practices and regular dental follow-ups, is crucial to restoring oral function and preserving periodontal health after tooth loss.

Dysfunction and Parafunctions (Teeth Grinding, Bruxism)

Parafunctions, such as teeth grinding (bruxism), are prevalent dental issues affecting a significant portion of the population, with studies indicating that 8-31% of adults experience bruxism, especially among those aged 25 to 44 years. Bruxism can occur during the day (awake bruxism) or at night (sleep bruxism), and is often linked to stress, anxiety, or dental misalignment. Stress reduction techniques, including relaxation exercises and cognitive behavioral therapy (CBT), can help alleviate the psychological triggers of bruxism.

Bruxism leads to tooth wear, fractures, and increased tooth sensitivity, as well

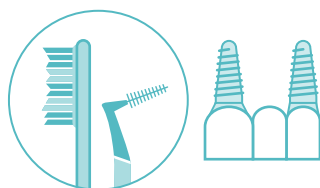
In summary, appropriate orthodontic treatment, coupled with effective oral hygiene practices and patient education, is key to improving both functional and periodontal health outcomes.

Tooth Loss and Replacement (Removable, Fixed Prostheses, and Implant-Supported Prostheses)

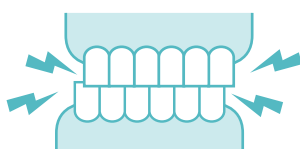
Tooth loss, whether due to periodontal disease, caries, or trauma, significantly impacts oral and periodontal health, leading to functional and aesthetic challenges. Tooth loss can result in decreased masticatory efficiency, altered speech, and negative psychosocial effects. Early intervention with appropriate prosthetic solutions, such as removable or fixed prostheses, can restore function and improve aesthetics. Removable prostheses offer a non-invasive solution but may cause discomfort or bone resorption if not properly fitted. Ensuring proper fit and retention through regular adjustments and using high-quality materials can mitigate discomfort and prevent further bone loss.

Fixed prostheses, such as crowns and bridges, can effectively restore dental function but may lead to complications such as caries in abutment teeth or periodontal disease due to improper cleaning. Maintaining excellent oral

Choosing the right prosthetic option based on individual needs, combined with proper oral hygiene practices and regular dental follow-ups, is crucial to restoring oral function



8/31% of adults experience bruxism, especially among those aged 25 to 44 years often linked to stress, anxiety, or dental misalignment



as temporomandibular joint disorders (TMD), which can cause jaw pain and dysfunction. Custom dental splints or night guards can protect the teeth from wear and prevent fractures. These devices can be made to fit the individual's dental anatomy, offering significant relief. For TMD, treatment may involve physical therapy, muscle relaxation exercises, and the use of anti-inflammatory medications or warm compresses.

Dental misalignment can exacerbate bruxism and contribute to its persistence. Correcting misalignments with orthodontic treatment, such as braces or aligners, may help improve bite and reduce bruxism-related issues.

Early intervention is crucial to prevent long-term damage, including the development of TMD and other complications. Raising awareness and educating patients about bruxism's impact on oral health is essential, as is the use of specialized products like anti-bruxism devices. Additionally, professional evaluations and consultations are necessary to identify the appropriate treatment plans and manage this parafunctional habit effectively.

Risk Factors

Several risk factors significantly contribute to the development of periodontal diseases in adults. These factors include tobacco use, diabetes, obesity, and poor oral hygiene.

- **Tobacco Use:** Smokers are at a markedly higher risk of developing periodontitis, with studies indicating that they are 2-3 times more likely to be affected compared to non-smokers.
- **Diabetes:** Individuals with diabetes are more prone to periodontal diseases, with prevalence rates approximately 50% higher in patients with diabetes than in those without.

- **Obesity:** A significant correlation exists between obesity and periodontitis, suggesting that obese individuals have a 30% higher risk of developing the disease.

These risk factors underscore the importance of targeted prevention and management strategies to reduce the incidence of periodontal diseases in at-risk populations.

Lack of Oral Health Upkeep and Regular Dental Cleanings

Maintaining oral and periodontal health during adulthood (ages 20–59) is vital, yet many face challenges due to busy schedules and financial constraints. The European Federation of Periodontology recommends regular dental check-ups and dental cleanings at intervals of 3, 4 or 6 months, according to individual needs (<https://www.efp.org/for-patients/gum-diseases/gum-disease-prevention>); however, approximately 35% of adults report not visiting the dentist regularly due to these barriers. This lack of maintenance contributes to periodontal disease. Furthermore, prioritizing routine dental care can reduce the incidence of gum disease. Thus, addressing these barriers is essential to enhance both oral and overall health outcomes in adults.

Systemic Connections, Systemic risk factors

Periodontitis is linked to systemic conditions, such as cardiovascular disease and adverse pregnancy outcomes. Maintaining oral and periodontal health in adulthood (20–59 years) is crucial for both dental well-being and systemic health. Periodontitis, a chronic inflammatory disease, has been associated with a 20–30% increased risk of cardiovascular diseases, including heart disease and stroke. Individuals with periodontitis are 2.5 times more likely to develop cardiovascular conditions compared

Individuals with diabetes are more prone to periodontal diseases, with prevalence rates approximately 50% higher than in those without



A significant correlation exists between obesity and periodontitis, suggesting that obese individuals have a 30% higher risk of developing the disease



The European Federation of Periodontology recommends regular dental check-ups and dental cleanings at intervals of 3, 4 or 6 months, according to individual needs



Periodontitis is linked to systemic conditions, such as cardiovascular disease and adverse pregnancy outcomes



Approximately 50% of individuals with severe periodontal disease are smokers.



Alcohol consumption also negatively impacts periodontal health; heavy drinkers, consuming more than 20 alcoholic drinks per week, face a higher risk of developing periodontal issues compared to moderate drinkers



to those without. Furthermore, the population attributable fraction (PAF) for developing chronic obstructive pulmonary disease (COPD) due to periodontitis was 22.6%. These findings highlight the importance of preventive measures and effective management strategies for periodontal diseases to improve overall health outcomes in adults.

Smoking, Alcohol, and Drug Abuse: Impacts on Periodontal Health

The use of tobacco products, alcohol, and illicit drugs significantly affects periodontal health. Evidence from cross-sectional and case-control studies in various populations demonstrates that adult smokers are approximately three times as likely as non-smokers to have periodontitis. The association between smoking and attachment loss is even stronger when the definition of periodontitis is restricted to the most severely affected subjects. Approximately 50% of individuals with severe periodontal disease are smokers, further underscoring the strong association between tobacco use and periodontal deterioration.

Alcohol consumption also negatively impacts periodontal health; heavy drinkers, consuming more than 20 alcoholic drinks per week, face a higher risk of developing periodontal issues compared to moderate drinkers. Additionally, drug abuse, particularly with stimulants like methamphetamine, leads to xerostomia (dry mouth), which increases plaque accumulation and periodontal disease. Illicit drug use, especially heroin, crack, cocaine, and/or marijuana, is associated with more severe forms of periodontitis. Addressing these concerns requires comprehensive prevention strategies, integrating oral health education into addiction treatment programs to improve overall health outcomes.

Diet, physical activity, stress

Optimal oral and periodontal health in adulthood hinges on managing key lifestyle factors, including diet, physical activity, and stress management. Diets rich in fruits, vegetables, and omega-3 fatty acids may reduce periodontal inflammation, contributing to a lower risk of severe periodontitis. High Healthy Eating Index (HEI), and Mediterranean Diet Score (MDS), and low Dietary Inflammatory Index (DII) scores were associated with a low risk of periodontitis and better periodontal conditions.

Regular physical activity is vital, with moderate to vigorous exercise at least three times a week linked to a possibly reduction in periodontal disease risk.

Additionally, chronic stress elevates cortisol levels, leading to an increased risk of periodontal disease due to immunosuppression and neglect of oral hygiene.

By prioritizing healthy dietary choices, engaging in regular exercise, and managing stress effectively, adults can significantly improve their periodontal health and reduce the risk of oral diseases.

Impact of Eating Disorders on Oral and Periodontal Health

Eating disorders, including anorexia nervosa, bulimia nervosa, and binge-eating disorder, have significant effects on oral and periodontal health in adults aged 20–59. Individuals with anorexia may suffer from dental erosion and increased caries due to chronic malnutrition and decreased salivary flow, gastric acid from vomiting leading to a higher prevalence of dental decay. Bulimia nervosa, characterized by cycles of bingeing and purging, particularly harms dental health, as exposure to stomach acid from vomiting results in enamel erosion and dentin hypersensitivity. Additionally,

binge-eating disorder often results in poor dietary choices that raise the risk of periodontal disease due to higher sugar intake and reduced nutritional quality. Regular dental check-ups and customized oral hygiene education are essential for this population to mitigate long-term consequences, as untreated conditions can lead to severe complications, including tooth loss and systemic health issues.

Comorbidities (Chronic Diseases)

Maintaining oral and periodontal health in adulthood (ages 20–59) is essential for the early detection of comorbidities, particularly chronic diseases like diabetes, cardiovascular disease, and respiratory conditions. Periodontal disease can exacerbate systemic inflammation, increasing the risk of chronic diseases; for instance, individuals with periodontitis face a 50% higher risk of developing cardiovascular disease. Furthermore, those with diabetes are up to three times more likely to develop periodontitis, linked to impaired immune responses and poor glycemic control. Notably, periodontal treatment can improve HbA1c levels by up to 0.4% in diabetic patients, highlighting a bidirectional relationship. Routine periodontal examinations can aid in identifying undiagnosed comorbidities. 15% of patients showed early signs of chronic disease during assessments. Promotion of a multi-disciplinary approach with other healthcare providers (e.g. family doctor), which includes an exchange patient information and history of illness, is vital to improve oral and overall health. Thus, regular dental check-ups and periodontal evaluations should be integrated into a chronic disease management program to enhance both oral and systemic health outcomes.

Pregnancy

For pregnant women, maintaining periodontal health is crucial, as periodontal disease significantly increases the risk of

adverse outcomes, including preterm birth and low birth weight, by up to 7.5 times. Pregnancy induces various physiological changes that can adversely affect oral health; hormonal fluctuations, particularly elevated estrogen and progesterone levels, heighten gingival inflammation, making up to 70% of expectant mothers susceptible to pregnancy gingivitis. Research indicates that untreated periodontal disease is associated with a 50% increased risk of adverse outcomes such as preterm birth. Despite these risks, many women often neglect oral care during pregnancy due to misconceptions about the safety of dental treatments. Therefore, promoting regular dental check-ups and effective oral hygiene practices during pregnancy is vital for the health of both mothers and their infants.

Impact of Menopause and Andropause on Oral and Periodontal Health

Menopause in women and andropause in men (also called the climacteric transition period) bring about significant hormonal changes that can adversely affect oral and periodontal health. During menopause, a rapid decrease in estrogen levels leads to reduced saliva production, resulting in dry mouth (xerostomia), which increases the risk of cavities, gum disease, and oral infections. Furthermore, the reduced estrogen also impacts bone density, heightening the risk of periodontal disease and alveolar bone loss. To manage these symptoms, maintaining optimal hydration, using saliva substitutes, and incorporating fluoride treatments can help protect against dry mouth and cavities. Additionally, hormone replacement therapy (HRT) may be considered to mitigate the effects of bone loss and reduce the risk of periodontal disease, though it should be discussed with a healthcare provider.

In men, andropause, characterized by a low decline in testosterone levels, can lead to similar oral health issues,

Periodontal disease can exacerbate systemic inflammation, increasing the risk of chronic diseases



Regular dental check-ups and periodontal evaluations should be integrated into a chronic disease management program to enhance both oral and systemic health outcomes



For pregnant women, maintaining periodontal health is crucial, as periodontal disease significantly increases the risk of adverse outcomes



Menopause in women and andropause in men can adversely affect oral and periodontal health



including a higher prevalence of gingivitis and periodontitis. This may be due to changes in the immune system and increased susceptibility to inflammatory responses. Proper oral hygiene practices, such as regular brushing, flossing, and professional cleanings, are essential for preventing periodontal diseases. The use of anti-microbial mouth rinses or gels, and more frequent dental check-ups, can help address inflammation and prevent progression to severe periodontal disease.

Both menopause and andropause highlight the need for increased awareness and proactive oral care. Regular dental visits, coupled with tailored interventions such as HRT or lifestyle modifications, are essential for preserving periodontal health during these life stages.

periodontitis and low educational attainment is associated with an 86% and a 44% increased risk of periodontitis and caries prevalence.

- Integration of oral health assessments and preventive interventions into primary care to decrease periodontitis incidence and to manage gingivitis.
- Addressing risk factors and implementing effective public health strategies to reduce the burden of periodontal diseases and improve overall health outcomes.

Direct treatment costs due to the 3 most common oral conditions (caries, severe periodontitis, and tooth loss) were estimated at US\$357 billion yearly, which translates to 4.9% of global health expenditure



Public Health Implications

Economic burden: direct treatment costs due to the 3 most common oral conditions (caries, severe periodontitis, and tooth loss) were estimated at US\$357 billion yearly, which translates to 4.9% of global health expenditure.

Effective prevention and management of gingivitis and periodontitis are crucial public health priorities due to their high global prevalence. Actions to be taken should include:

- Promotion of educational campaigns on proper oral hygiene, such as brushing twice daily and flossing, to reduce the risk of periodontal disease.
- Encouragement of regular dental check-ups which can lower the progression of periodontal disease.
- Improvement of access to care by addressing socio-economic barriers. Low-income individuals are 2.5 times more likely to experience



Seniors +60 years

Introduction

As discussed, oral health is a crucial aspect of overall well-being, and it becomes even more significant as we age. According to World Population Prospects 2019 (United Nations, 2019), by 2050, 1 in 6 people in the world will be over the age of 65, up from 1 in 11 in 2019. For seniors, maintaining good oral hygiene can be a complex challenge due to a combination of physical, medical, and lifestyle factors. As people grow older, they may experience issues like tooth decay, periodontal disease, dry mouth, tooth loss, all of which can significantly impact their quality of life. These dental problems not only affect the ability to eat and speak comfortably but can also contribute to more severe health issues such as heart disease and diabetes. Seniors often face challenges in accessing dental care, whether due to financial constraints, limited mobility, or a lack of dental insurance. Moreover, medications commonly prescribed to older adults can lead to dry mouth and other oral health complications. Cognitive decline, such as dementia, can also hinder a senior's ability to maintain regular oral hygiene practices.

These are the key challenges seniors face in maintaining their oral health, which accentuate the need for general recommendations highlighting the importance of proper care and regular dental checkups. Proper oral hygiene and a full understanding of how to care for oneself at this stage will have a positive impact both on oral health and on systemic health, as well as on quality of life. Regular visits to the dentist are essential to obtain guidance on maintaining the health of teeth and oral mucosa or to receive the proper oral procedures necessary to restore health.

Key challenges in oral health elderly people face

Dental caries

Nearly all adults (96%) aged 65 years or older have had a cavity; 1 in 5 have

untreated tooth decay. These results can be explained by the fact that older people have less access to dental care. Older adults are at risk of caries development due to various reasons: xerostomia, reduced dexterity affecting oral hygiene and poor diet. Root caries is more prevalent in the older adult population due to root exposure after gingival recession. The exposed rough and irregular cementum is more susceptible to plaque retention and demineralization. As older adults are keeping their teeth longer, an increase in root cavities is expected in this growing population, leading to a greater need for treatment and a higher burden on dental care. Fluoride therapy is effective for caries prevention, as well as correct daily mechanical plaque removal. Interdental brushing is a critical aspect of maintaining optimal oral hygiene for seniors. Unlike standard toothbrushes, interdental brushes are specifically designed to clean the spaces between teeth where plaque tends to accumulate, and standard toothbrush cannot adequately reach. These areas are particularly susceptible in older adults due to physiological changes, such as gum recession and the presence of wider embrasures. By incorporating interdental brushes into their daily routine, as well as frequent regular dental check-ups, professional tooth cleaning, patient education on oral hygiene instruction and dietary advice, seniors can achieve a higher standard of oral hygiene, ensuring better oral health and overall well-being.

Periodontal Disease

Periodontal disease is a chronic inflammatory disease accumulating throughout life and becomes irreversible if it progresses to periodontitis. It affects tooth supporting structures causing gingival recession, alveolar bone resorption and loss of attachment, tooth mobility and eventually tooth loss. The loosening of teeth and tooth loss reduce the ability to chew effectively, leading to significant emotional strain, challenges

As people grow older, they may experience issues like tooth decay, periodontal disease, dry mouth, tooth loss, all of which can significantly impact their quality of life



Increase in root cavities is expected in elderly population due to less access to dental care



Periodontal disease isn't just a result of aging



Edentulism can lead to poor nutrition



in daily activities, and a lower overall quality of life. Over 60% of adults aged 65 and older have some form of periodontal disease. Ageing is a well-established risk factor for periodontitis. The prevalence of severe periodontitis is the greatest in 65- to 74-year-olds, with younger populations accounting for only 1.7% of cases. Older adults are at higher risk for periodontal disease, which can lead to tooth loss, infections, and systemic health issues (e.g., heart disease). Periodontal disease isn't just a result of aging but is caused by dental biofilm, meaning it can be prevented with proper oral care. While the risk factors are similar across all ages, they worsen in older adults due to weaker immunity, conditions like diabetes, and physical limitations such as reduced dexterity and vision.

social engagement, reducing overall well-being. Tooth loss is associated with a higher risk of systemic conditions like heart disease and diabetes, largely due to the chronic inflammation from periodontal disease. Tackling tooth loss and its root causes with preventive care and timely treatment is essential for enhancing seniors' oral and overall health. Routine dental check-ups, proper hygiene, and access to restorative options like dentures or implants can greatly improve the well-being and quality of life for seniors dealing with edentulism.

The estimated global average prevalence of complete tooth loss is almost 23% for people aged 60 years or older.



Tooth Loss (Edentulism)

High prevalence of tooth loss is brought on by decay, wear over time, and periodontal disease, all of which can impair quality of life and function.

Masticatory function/quality of life

Elderly individuals over the age of 65 often experience a decline in masticatory (chewing) function due to a combination of factors that affect their teeth, gums, oral muscles, and overall health. The main reasons are tooth loss due to periodontal diseases, caries, trauma, dental attrition, ill-fitting dentures, reduced salivary flow, weakening of jaw muscles, bone resorption, some neurological conditions, and psychological factors.

The estimated global average prevalence of complete tooth loss is almost 23% for people aged 60 years or older. Tooth loss can lead to significant psychological and social challenges, including emotional distress, reduced self-esteem, and difficulty engaging in social interactions. Functionally, it can impair mastication (chewing), which may result in dietary restrictions and nutritional deficiencies. For older adults, these limitations often lead to the avoidance of certain foods, potentially impacting their overall health and quality of life. This limits dietary variety and can lead to poor nutrition. Elderly people with dental diseases or dentures tend to consume considerable amounts of soft meals high in saturated fat and cholesterol and to limit their consumption of fruits and vegetables.

Poor masticatory function makes it difficult for seniors to chew certain foods, especially harder or fibrous items like fruits, vegetables, and meats. This can lead to an imbalanced diet and nutritional deficiencies, as seniors may avoid these foods in favor of softer, often less nutritious, options. A lack of essential nutrients such as fiber, vitamins, and minerals (especially calcium and vitamin D) can contribute to malnutrition, weight loss, and weakened immune function and can worsen conditions like osteoporosis, frailty, and delayed wound healing.

Masticatory function has a profound impact on the overall health and quality of life for elderly individuals



Being without teeth can impact speech, lead to lower self-confidence, and hinder

Masticatory function has a profound impact on the overall health and quality of life for elderly individuals. The ability to chew properly influences not only physical health—by affecting nutrition and digestion—but also psychological well-being and social engagement. Proper oral care, dental treatments, rehabilitation of

chewing function with suitable prosthesis, supportive therapies can significantly improve chewing efficiency and, in turn, enhance the quality of life for seniors.

Enamel Wear

As people age, enamel becomes thinner and more susceptible to damage, increasing the risk of sensitivity, decay, and fractures. The aged population is prone to oral parafunctions such as bruxism and loosening of the vertical dimension, which can lead to poor masticatory function, low quality of life, and the possibility of losing other teeth.

Xerostomia (dry mouth)

Dry mouth is a common condition among seniors with a prevalence of 33%, characterized by a decrease in saliva production, leading to a dry or sticky sensation in the mouth. This condition is prevalent in older adults as a side effect due to a combination of factors such as medication use, underlying medical conditions, cancer treatment, reduced fluid intake, and changes in the body's natural physiology. Patients with xerostomia have increased risk of dental caries and periodontal disease, difficulty in speaking and swallowing, burning mouth syndrome, taste alteration and denture related problems such as soreness, ulcers and Candida infection. Prevention and management: oral hygiene instructions, fluoride application, dietary advice, hydration, use of saliva substitutes, regular dental check-ups.

Polypharmacy and Medication Side Effects

Many elderly people take multiple medications; this increases their vulnerability to drug interactions which could affect their oral health. Taking multiple medications for non-communicable diseases has adverse effects on oral health among which xerostomia is the most common problem. Xerostomia is further associated with

other oral problems such as dental caries, periodontal disease and oral infections. Most prescribed drugs in elderly are for hypercholesterolemia, antihypertensive agents, analgesics, diabetes and thyroid medications, anticoagulants and antiplatelet agents, antidepressants. Medications like bisphosphonates (used to treat osteoporosis or cancer) can affect jawbone health and increase the risk of osteonecrosis of the jaw after dental procedures.

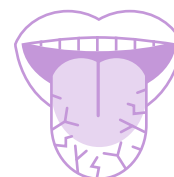
Cognitive and Physical Limitations

Cognitive impairments may make it difficult for elderly patients to cooperate during dental visits or adhere to oral hygiene routines, leading to neglect of oral health. Conditions like arthritis can make it hard for elderly patients to brush and floss effectively, contributing to plaque buildup and other oral health problems. The issue with complex dental restorations/ dental prosthesis is that their maintenance is dependent upon the neuromuscular coordination and cognitive abilities of their owners. The maintenance abilities gradually diminish with age, and if both home and professional care are neglected, it raises the risk for oral health deterioration. Poor vision can limit a senior's ability to see clearly when brushing or flossing, resulting in missed areas and insufficient cleaning. Moreover, conditions like Alzheimer's or dementia can make it difficult for seniors to remember to brush their teeth or understand how to properly use dental tools. By adapting oral hygiene tools and routines, seniors with physical, sensory, or cognitive limitations can maintain better oral health, which in turn supports their overall well-being.

Candidiasis

The prevalence of oral candidiasis and oral mucosal lesions is higher among elderly people due to predisposing factors such as compromised immune system, use of medications and dentures. Indeed, the prevalence of denture wear rises with age.

Dry mouth is a common condition among seniors with a prevalence of 33%



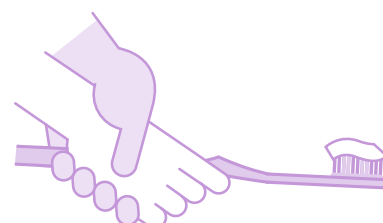
Staying hydrated is very important for elderly oral health



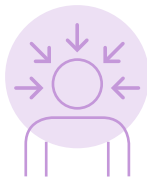
Taking multiple medicines can have adverse effects on oral health



Adapting oral hygiene tools and routines for elderly helps to avoid oral health neglect



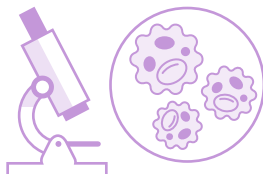
Controlling lifestyle habits decrease risk of oral diseases among seniors



Systemic factors include decreased saliva flow, chronic diseases, malnutrition, while local factors consist of wearing dentures overnight, poorly fitting dentures and inadequate prosthesis hygiene.

Lifestyle habits like smoking, alcohol use, and substance abuse can significantly impact the oral health of the elderly. These behaviors often lead to a range of serious dental problems and exacerbate existing conditions, increase the risks of oral cancer, tooth loss, periodontal disease, and delayed healing. Smoking cessation, alcohol reduction, and substance abuse recovery, combined with regular dental care and education, are critical for mitigating these risks and improving overall oral health outcomes in seniors.

Regular screening for oral cancer can save lives



Oral Cancer

Oral cancer includes cancers of the lip, other parts of the mouth and the oropharynx and combined rank as the 13th most common cancer worldwide. The global incidence of cancers of the lip and oral cavity is estimated to be 377,713 new cases and 177,757 deaths in 2020. It is a significant health concern, as the risk of developing this condition increases with age. The incidence of oral cancer increases with age, as people over 65 may have fragile, thin oral mucosa that enables toxic substances to pass through, with about 65% of oral cancer cases being diagnosed in this age group. Elderly individuals have a higher risk of developing oral cancers (often due to tobacco use, alcohol consumption, sun exposure or HPV infection, neglected dental care, irritation from ill-fitting dentures). Regular screening, oral mucosa inspection at every visit, leading to early detection, and treatment are essential for improving outcomes, but unfortunately the disease often progresses undetected in older adults due to delayed diagnosis or overlooked symptoms. Persistent sores in the mouth, on the lips, or throat that don't heal within two weeks should not be overlooked.

Links with chronic diseases

The typical aging patient's baseline health state can be complicated by many conditions and physiologic changes associated with aging. Almost 75% of adults over age of 85 have at least one chronic condition and many have multiple conditions. The most common chronic diseases are hypertension, diabetes mellitus, rheumatoid arthritis, Alzheimer's disease, Parkinson's disease and depression. These systemic diseases and their related medications make older adults more susceptible to oral diseases such as periodontal disease, dental caries and even oral cancer. The presence of the oral biofilm may increase the risk of respiratory tract infections in frail older people. Denture wearing during the night doubles the risk of aspiration pneumonia. Poor oral health and oral infections are connected to cardiovascular diseases. Periodontitis can have systemic effects that may promote the development of atherosclerosis or trigger acute cardiovascular events by creating an inflammatory and procoagulant state in the body. Seniors with diabetes are more likely to develop gum disease, and untreated gum disease can make blood sugar levels harder to control, worsening diabetes. Elderly people with uncontrolled diabetes are at a greater risk of severe periodontitis, and treating gum disease in this group has been shown to help improve glycemic control. Research has found that seniors with chronic periodontal disease are more likely to experience faster cognitive decline, with some studies detecting oral bacteria in the brains of patients with Alzheimer's. Elderly individuals with a history of poor oral hygiene or chronic periodontal disease are at an elevated risk of developing cancers, especially oral cancer, as well as cancers of the esophagus and pancreas. To minimize the risk of chronic diseases related to poor oral health, it is essential for elderly individuals to maintain good oral hygiene, regular dental check-ups, quit smoking and limit alcohol and follow a balance diet.

Good oral hygiene is essential for elderly patients with chronic diseases



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