



# Boomers and Seniors:

LIVING LONGER, LIVING HEALTHIER  
CONSIDERATIONS FOR DENTAL PROFESSIONALS

## Disclosure Statement:

- This course was designed, developed and produced by Water Pik, Inc
- Water Pik, Inc. manufactures and distributes products addressed in this course

## Course Objective:

To provide the dental team with research and information to understand and recognize the overall health needs and expectations of Baby Boomers and Senior citizens and provide them with quality care and patient service.

## Learning Outcomes:

- Understand the societal and social impact of aging
- Identify the chronic diseases and conditions affecting those over age 45
- Discuss the potential links between oral and systemic health
- Recognize how physical limitations affect daily self-care
- Evaluate the self-care measures available for the reduction of gingivitis and bleeding and recommend products/regimens appropriate to need

## INTRODUCTION

Since the beginning of the 20th century, life expectancy has increased dramatically. A person born in 1900 had a life expectancy of only 47.3 years. Now, a baby born in 2000 can expect to live 76.9 years. Modern medicine along with a greater awareness of health and wellness is helping people live longer and healthier. About 36 million people in the US are over the age of 65. By 2030, that number is estimated to double as Baby Boomers begin turning 65 in 2011.<sup>1</sup>

Baby boomers turning into senior citizens will likely not only have the numbers but the skills to redefine 'old age.' They will be better educated, especially women, and this may increase longevity, income, and living standards. Retirement might mean a shift to part-time work rather than not working at all. Older women are most likely to live alone not just due to widowhood but divorce. More are likely to continue to live in their communities utilizing assistance from paid or family caregivers as opposed to nursing homes or other institutions.<sup>1</sup>

***By 2030, the number of seniors is anticipated to grow from 35 million to 72 million; making them 20% of the US population.<sup>1</sup>***

## BOOMING NUMBERS OF SENIORS: IMPACT ON SOCIETY

As Boomers begin aging the demographics of the US population begins a significant shift; the older population will grow at a faster pace than the total population. It is estimated that by 2012, more than 100 million Americans will be age 50 or older.<sup>2</sup> By 2030, the number of seniors is anticipated to grow from 35 million to 72 million; making them 20% of the US population. It is projected that they will be more diverse than in the past; 72% non Hispanic white, 11% Hispanic, 10% African American, 5% Asian. The number of oldest old (> 85 years) is also expected to rapidly increase as is the number of people age 100 and older. From 1990 to 2000, centenarians increased from 37,000 to 50,000. Most (80%) are women.

## Work and Retirement

By the year 2020, when all Baby Boomers will be 55 years or older, the percentage of workers age 55 and up is projected to be over 20%; an anticipated 8% increase from 2000. Between 2003 and 2010, the fastest growing labor force group will be aged 55 to 64. Compared to people in the 40-49 year old age group, who cite money as the primary reason for work, those age 50 and up list the enjoyment of working and usefulness as the most common reasons for staying employed. In fact those with the highest levels of education are the most likely to stay in the workforce longest.<sup>1</sup>

Today, older workers are choosing to transition into retirement rather than stop working completely. Many are opting to work part-time or in non traditional settings. Social researchers are now referring to retirement as a process and the employment period around it as 'bridge' jobs. More older individuals than younger choose self-employment or alternative employment arrangements such as independent contracting, on-call work, temporary help, or contractual agreements.<sup>1</sup>

Senior citizens who stay in the work force are twice as likely as their non working counterparts to report that they are in very good to excellent health. In fact, those who retired at an early age, between 50 and 58 were the most likely group to report poor health as a major reason for retirement. Baby boomers seem to expect that not only will they work into their retirement years but they will be healthy. Data indicates they do not believe they will need to depend on their children.<sup>1</sup>

## Income and Wealth

In 2003, the median household income for those 65 and over was \$23,787. Currently, income for those over 65 comes from four sources; Social Security (39%), earnings (24%), pensions

(18%), and assets (16%). Boomers believe they will use more self-directed resources for retirement including income, IRAs, 401Ks, savings and investments in addition to Social Security. Seniors who continue to work and have earnings as a component of income have higher overall family incomes and financial assets than those who do not work.<sup>1</sup>

Poverty is still a problem for older adults but has dropped dramatically from 1959 when the rate was 35.2% to 10.2% in 2003. Older women, African Americans, and Hispanics are the most likely to live in poverty. Work history, particularly number of years in the workforce, has been shown to be an important predictor of poverty. Men have a better history of preparing for retirement; they are also more likely to hold positions that sponsor retirement plans versus women. The gap is closing with more women working full time and receiving better earnings.<sup>1</sup>

People over the age of 55 tend to have the highest level of wealth or economic resources. Wealth is different from income in that it consists of home equity, savings, and investments. Net worth is measured by the difference between one's assets and liabilities or debts. While younger workers have higher incomes, they tend to have lower assets. For seniors, income is lower while assets are generally higher.<sup>1</sup>

## Housing

About 80% of people over the age of 65 own their own home. The majority live in single family homes and a small percentage (6.7%) live in mobile homes or trailers. Most do not move. Those that do tend to do so around the time of retirement for reasons such as climate, property, or health care access. Older seniors who move often do so for health reasons. Seniors who own their own home have nearly double the income of those who rent. Older individuals tend to live in older homes.<sup>1</sup>

In 2000, about 4.5% of those 65 and older lived in a nursing home. With increasing age, living in a nursing home becomes more likely with about 18% of those over 85 years residing in one. The majority (41.7%) of seniors living in a nursing home are women over age 85. Male nursing home residents are generally younger; possibly because they have higher rates of serious and/or permanent injuries at a younger age.<sup>1</sup>

The percentage of older people living in a nursing home has been declining since 1990. Both improved health and increasing options for long-term care play a role. Assisted living, which allows people to have more privacy and independence yet provides some personal and nursing services as needed is increasingly popular as are residential care facilities. Residential facilities have various levels of care in close proximity allowing people to move between arrangements as they need.<sup>1</sup>

## CHRONIC CONDITIONS: MEDICALLY COMPLEX AND COMPROMISED

Heart disease, stroke, and cancer are the leading cause of death in seniors. Even though heart disease claims 1.8 million per year in those over 65, the rate is declining. For cancer, lung continues to be the leading cause of mortality; while it has declined in men, it has increased in women and surpasses breast cancer. About 80% have at least one chronic health condition and 50% have two. Leading chronic conditions are cardiovascular diseases, diabetes, and respiratory disorders.<sup>1</sup>

### Heart Disease and Stroke

Cardiovascular disease (CVD) is responsible for one of every 2.8 deaths. CVD accounts for more deaths in the US than any other cause; it is the leading cause of death in both men and women. Thirty-two percent of CVD deaths occur before age 75. The average age of a first myocardial infarction (MI) is 64.5 years for men and 70.4 years for women. The average number of life years lost due to MI is fifteen.<sup>3</sup>

Major risk factors for CVD include high blood pressure (HBP), high cholesterol, smoking, and diabetes. HBP is a factor in 69% of people who have a first heart attack and in 77% of first strokes. It affects one in three adults. Until age 45, more men than women have HBP; between 45 and 54 years, the percentages are similar. After age 54, more women than men have HBP. For cholesterol, 36.5% of adults have been told they have high cholesterol. Only about half who qualify for treatments are receiving it; and about one third of patients achieve their LDL goal. Cigarette smokers have a 2-3 fold increased risk of dying from coronary heart disease. Adults who smoke die 14 years earlier than non smokers. In 2004, 28% of women and 49% of men aged 65 and over were former smokers. For diabetes, heart disease death rates are 2 to 4 times higher than for people without diabetes. Approximately 65% of people with diabetes die of some type of heart disease or stroke.<sup>3</sup>

Prevention of key risk factor development at middle age appears to be critical in improving healthy longevity. Low levels of risk factors between the ages of 40 and 50 have been shown to predict overall survival and morbidity-free survival to age 85 and beyond. Conversely, when adverse levels of the four top risk factors were present at middle age, only 5% of men and 15% of women survived to age 85. Other lifestyle factors have been evaluated in addition to not smoking including drinking a moderate amount of alcohol daily, 30 minutes of daily physical activity, a normal weight as measured by BMI, and adherence to a healthy diet. People who engaged in 3 of 5 activities reduced their risk of CVD by 57%; for four, the risk reduction was 66% and with all five 83%.<sup>3</sup>

## Diabetes and Obesity

Diabetes affects 20.9% (10.3 million) of people ages 65 and older. Another 54 million people aged 45 and older have pre-diabetes; a condition in which the fasting blood sugar is higher than normal, but not high enough to be considered diabetes. Prediabetes increases the risk of developing type 2 diabetes.<sup>4</sup> About one half of all cases of diabetes are diagnosed between the ages of 45 and 59. Another 25% are diagnosed at 60 or older.<sup>5</sup> More than 42% of those with diabetes are 65 years or older. As the numbers of seniors grow, it is estimated that the proportion will increase to 53% by 2025 and 58% by 2050.<sup>6</sup>

Diabetes is the 6th leading cause of death in the US. CVD accounts for about 65% of all deaths in people with diabetes.<sup>4</sup> Research has shown that people with diabetes who suffer an MI have a significantly higher mortality rate at 30 days and one year post MI than those who suffered a heart attack and did not have diabetes.<sup>7</sup> It has also been shown that greater than 1 in 5 people ages 50-75 with type 2 diabetes may have asymptomatic coronary artery disease.<sup>8</sup>

Not only does diabetes contribute to earlier mortality but it can significantly impair the quality of life and can lead to life-altering disabilities. It is the leading cause of blindness and kidney failure. It affects the nervous system; almost 30% of people with diabetes over age 40 have impaired sensation in their feet. Diabetes is responsible for more than 60% of non-traumatic limb amputations.<sup>4</sup> In addition to recognized systemic complications, having diabetes has been associated with increased cognitive decline, physical disability, falls, and fractures. NHANES III showed that men and women over age 60 with diabetes were more likely to be unable to walk a quarter of a mile, climb stairs and do housework when compared to similar aged cohorts without diabetes.<sup>6</sup>

Obesity is a well-established risk factor for type 2 diabetes. Over 80% of people with diabetes are overweight or obese.<sup>9</sup> Recent statistics indicate that 66.3% of the adult population is overweight or obese with 32.2% being obese and 4.8% being extremely obese. Overweight and obese are measured not just by weight but a calculation of height and weight called Body Mass Index or BMI. See Table 1. Overweight and obesity tend to increase across the lifespan until about age 60; however more than 70% of people age 60 and over are overweight or obese.<sup>10</sup>

BMI	Classification
<18.5	Underweight
18.5-24.9	Healthy
25-29.9	Overweight
>30	Obese

Being overweight or obese in adulthood is associated with a significant decrease in life expectancy and early mortality.<sup>11</sup> In

addition to diabetes, it is associated with many chronic or life-threatening conditions including heart disease and high blood pressure. See Table 2. Like diabetes, obesity can affect the quality of life through limited mobility as well as social and job discrimination.<sup>9</sup>

• Heart Disease
• Cancer – Breast, Endometrial, Colon
• Type 2 Diabetes
• Stroke
• Osteoarthritis
• Sleep Apnea
• Depression

## Lung Cancer and Chronic Obstructive Pulmonary Disease

Lung cancer is the leading cause of cancer death among people 65 years and older. Since the 1990's lung cancer deaths have decreased in men ages 65 to 84 but have increased in men aged 85 and older and in women > 65. Smoking is the primary causative factor; the risk increases with duration, quantity, and intensity of smoking. Women who smoke two or more packs of cigarettes a day have a 20 times greater risk of dying of lung cancer. Lung cancer has surpassed breast cancer as the leading cause of cancer deaths in women 65 and older.<sup>1</sup>

Chronic Obstructive Pulmonary Disease (COPD) is a term for a group of lung diseases that obstruct airflow and interfere with breathing. About 12 million adults have been diagnosed with COPD and another 12 million may have it and not be aware of it. It represents the 4th leading cause of death in the US. COPD death is higher among women than men.<sup>12</sup>

The two most common forms of COPD are emphysema and chronic bronchitis. In many cases they co-exist. About 2.2 million people over the age of 65 have chronic bronchitis. Twice as many women as men are diagnosed with chronic bronchitis. Approximately 4.1 million people have emphysema; 93% of those are over the age of 45. Men are twice as likely to have emphysema as women.<sup>12</sup>

## Alzheimer's Disease and Dementia

An estimated 4.5 million people have Alzheimer's Disease; 10% are over age 65 and 50% are over 85 years. Due to the aging Baby Boomer population, it is estimated that by 2050, 16 million people will suffer from the disease. The likelihood of developing Alzheimer's doubles every five years after age 65. Alzheimer's is a form of dementia and is the most common cause accounting for 70% of cases. Risk factors for the disease are increasing age, family history, and genetics. New evidence suggests a link between heart health and Alzheimer's. Conditions such as diabetes, heart disease and stroke, hypertension, and high chole-

terol appear to increase the likelihood of Alzheimer's or vascular dementia.<sup>13</sup> Vascular dementia is the second most common type. It occurs as a result of small, generally asymptomatic strokes that block arteries. Vascular dementia and Alzheimer's may occur together in what is called mixed dementia. It is also not uncommon for individuals with Parkinson's disease to suffer from dementia. Other rare conditions can cause dementia as well as trauma or injuries to the brain.<sup>13</sup>

The effects of Alzheimer's disease and dementia are not just limited to the one suffering but to family and caregivers as well. More than 7 out of 10 people with Alzheimer's live at home; and 75% receive care from family and friends. A person with Alzheimer's lives about 8-10 years from the time of diagnosis. It is not uncommon for an Alzheimer's patient to have additional health problems such as diabetes or CVD<sup>1</sup> Many Boomers find themselves raising children and caring for an elderly or disabled parent; commonly referred to as the "Sandwich Generation."

## LIMITATIONS AND DISABILITIES

The Americans With Disabilities Act defines disability as a substantial limitation in a major life activity. This includes not just the ability to reach, bend, stoop, stand, sit, or lift but activities of daily living (ADL) such as bathing, eating, toileting, dressing, and getting out of bed or a chair. An individual may also be considered disabled if they cannot fix their own meals, do light housework, manage their own money, and use the telephone or shop for personal items (Instrumental Activities of Daily Living). About 14 million people over the age of 70 have some type of disability.<sup>1</sup> A recent study found that the ability to delay the onset of disability was a stronger predictor of longevity than staving off disease. About a third of people living past age 100 had coped with chronic illness for 15 years or more prior to turning 100. Even though more women made it to age 100, more men were functionally independent.<sup>14</sup>

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Disability can result from chronic diseases. In addition to diabetes, CVD, COPD, and Alzheimer's, osteoporosis and arthritis can be significant causes. Older individuals are also more likely to have vision or hearing impairments that may decrease their functional independence.<sup>1</sup>

## Osteoporosis and Hip Fractures

The National Osteoporosis Foundations estimates that about 10 million people in the US have osteoporosis. Of this number, 8 million are women. Women can lose up to 20% of their bone mass five to seven years following menopause. Many factors

can play a role in the risk for osteoporosis including aging, low lifetime calcium intake, Vitamin D deficiency, an inactive lifestyle, cigarette smoking, and excessive use of alcohol. It is often under-recognized and under treated.<sup>15</sup>

Osteoporosis can lead to bone fragility and increased risks for fracture. It is responsible for 1.5 million fractures yearly. See Table 3. One in two women and one in four men over age 50 will experience an osteoporosis related fracture. Women who have had a hip fracture are four times more likely to experience a second hip fracture. The risk is equal to the combined risk of breast, uterine, and ovarian cancer. Hip fractures reduce quality of life. On average, 24% of hip fracture patients over age 50 will die in the year following the fracture. One in five will end up in a nursing home. At six months after a hip fracture, only 15% can walk unaided across a room. Many require extensive long-term care.<sup>15</sup>

**Table 3: Yearly Osteoporosis-Related Fractures:<sup>15</sup>**

Location:	Amount:
Hip fractures	300,000+
Vertebral fractures	700,000
Wrist fractures	250,000
Fractures at other sites	300,000

## Arthritis

Arthritis is the leading cause of disability in older individuals. It is second only to heart disease as a cause of work disability.<sup>16</sup> It affects 50% of people over the age of 65 and is responsible for 19.3% of activity limitations in those 75 and older and for 11.8% in people 65 to 74.<sup>1,17</sup> More women than men are affected. It is more prevalent in those who are overweight or obese than those of a normal weight.<sup>17</sup> It affects about 50% of adults with diabetes and heart disease.<sup>18</sup> See Table 4

**Table 4: Percentage of Adults with Diabetes, Heart Disease or HBP who also have Arthritis 2005**

Disease	Percent with Arthritis
Diabetes	52.4%
Heart Disease	57.6%
High Blood Pressure	47.6%

**\*adapted from CDC At A Glance, 2007<sup>18</sup>**

Arthritis encompasses more than 100 diseases and conditions that affect the joints, and tissue.<sup>1</sup> The most common form of arthritis is osteoarthritis. Other common types are rheumatoid arthritis, gout, fibromyalgia, lupus, and scleroderma.<sup>16</sup> Osteoarthritis can cause pain, aching, stiffness, and swelling around joints while rheumatoid arthritis and lupus can affect multiple organs and generalized symptoms.<sup>17</sup>

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Any type of arthritis can impair quality of life and lead to disability. It is associated with major depression and is responsible for a growing number of total knee replacements. Many with arthritis report that they cannot walk a short distance, climb stairs, or stoop, bend and kneel. There is often no participation in leisure time activities. Physical activity can play an important role in lessening the symptoms. Data has shown that older adults with knee osteoarthritis who engage in moderate physical activity at least three times per week can reduce the risk of disability by 47%. Weight loss is another key factor. Women who lost as little as 11 pounds reduced the risk of knee osteoarthritis by 50%.<sup>17</sup>

## Impairment of Vision or Hearing

Vision and hearing impairments impact the quality of life and independence of older individuals. They are risk factors for falls, social isolation, and depression. Seniors account for about 37% of all hearing impairments and 30% of vision impairments. One in five adults age 70 and over has both hearing and vision loss.<sup>1</sup>

Vision impairment is defined as having 20/40 vision or worse in the better eye even with glasses. As the age of the Baby Boomer generation increases, the number of individuals with age-related eye disease and vision impairment is expected to double over the next 30 years. Age-related eye diseases such as macular degeneration, cataracts, diabetic retinopathy, and glaucoma, are the leading causes of vision impairment.<sup>19</sup>

Cataracts and glaucoma account for a significant portion of vision impairment in the US. Cataracts affect 20.5 million people over the age of 40; by age 80 more than half will have had a cataract. Surgery is the most common form of treatment. It does not cure the disease but it controls vision loss. Glaucoma affects about 2.2 million of those 40 and greater. It cannot be prevented but it can be controlled and the vision loss slowed. About half of those with glaucoma are unaware that they have it.<sup>19</sup>

According to the American Medical Association, hearing loss is the third most chronic condition among seniors after high blood pressure and arthritis. Hearing loss is gradual and may go undetected. Common symptoms include difficulty in filtering out background noise and following conversations.<sup>20</sup> Older individuals are more likely to wear glasses than hearing aids. Almost half of people over age 85 are hearing impaired.<sup>1</sup>

## ORAL HEALTH IMPLICATIONS

Over the last decade, there have been numerous studies evaluating the effect of periodontal disease on chronic diseases especially cardiovascular disease and diabetes. While it appears that poor oral health and poor physical health are linked through more than coincidence, causal relationships have been difficult to determine.<sup>21,22</sup> Periodontal disease and cardiovascular disease share many common risk factors: smoking, diabetes, obesity, stress, socioeconomic factors, and health awareness.<sup>21</sup>

New research seems to indicate that inflammation may be another common denominator in these chronic diseases including periodontitis.<sup>23,24</sup>

## Cardiovascular Disease

A meta-analysis of studies on periodontal disease and CVD found some evidence that the periodontal infection did increase the risk of CVD; but the association was not strong.<sup>21</sup> Similarly, Dietrich and Garcia evaluated the strength of the evidence of studies showing links between periodontitis and CVD and found significant, but modest associations.<sup>22</sup> Recent work by Drs. Offenbacher and Beck found distinct differences in the immune response of individuals to periodontal bacteria. Those who had the highest antibody response, regardless of level of bacteria, were the most likely to have evidence of other chronic diseases such as CVD and diabetes. Those with low levels of bacteria and low antibodies responses were the healthiest.<sup>25</sup> As newer studies focus on the immune response rather than clinical measures like periodontal pocketing and attachment loss, new findings will likely come to light.

Based on the weakness of current evidence, the prevailing belief is that periodontal treatment should not be recommended solely for the purpose of treating or preventing CVD.<sup>26</sup> Beck and Offenbacher theorize that because CVD is a disease that requires decades to emerge as a clinical condition, the benefit of oral health therapy may not be easily demonstrated. Most cardiovascular treatments require sustained interventions to prevent or treat.<sup>25</sup>

## Diabetes and Obesity

It is well-established that diabetes increases both the incidence and severity of periodontal disease. The strongest risk relationship seems to be for those with poor glucose control although many people with diabetes regardless of level of control may experience increased gingival inflammation.<sup>27</sup> The role of obesity is only beginning to emerge. Some studies have found a correlation between being obese and poor periodontal health. Genco et al showed that this correlation may be related to insulin resistance.<sup>28</sup>

The impact of periodontal disease on diabetes control is less clear. Taylor et al found that people with severe periodontal disease were four times more likely to have poor glycemic control compared to those with minor or no periodontal disease.<sup>29</sup> Recently, periodontal disease was shown to impact diabetic renal complications. Saremi et al found that periodontal disease was a strong predictor of mortality from both ischemic heart disease and diabetic nephropathy in a Pima Indian population with type 2 diabetes.<sup>30</sup> Likewise, Shultis showed that periodontal disease predicted the development of overt nephropathy and end stage renal disease, also in people with type 2 diabetes.<sup>31</sup>

Level of glycemic control seems to be a predictor of periodontal treatment outcomes. For those with good control, the response

to periodontal treatment is similar to an individual without diabetes. Individuals with poor control may also have an initial good response to therapy, but often have a rapid reoccurrence of the disease and less favorable long term outlook. The impact of periodontal therapy upon glycemic control is mixed.<sup>27</sup> One study by Grossi et al incorporated systemic antibiotics into the methodology and had promising outcomes. Conducted on a Native American population (Pima Indians of the Gila River Indian Community in Arizona), the investigators found that a combination of aggressive non surgical therapy and an antibiotic regime of systemic doxycycline, 100 mgs for two weeks, helped control the periodontal infection and reduce the level of glycated hemoglobin for three months post treatment. This reduction was short-term. By six months, A1C levels had returned to baseline reading.<sup>32</sup>

## Chronic Obstructive Pulmonary Diseases (COPD)

The association between COPD and periodontal disease has not been studied extensively. In 2001 an analysis of NHANES III data, Scannapieco and Ho found that those with COPD were more likely to have periodontal attachment loss than those without COPD. The results also showed that those with the most attachment loss had a higher risk of COPD as well as diminished lung function.<sup>33</sup> However, 2003 and 2006 systematic reviews found a very weak association between periodontal disease and COPD.<sup>34,35</sup> A stronger association has been found between periodontal disease and nosocomial (hospital or institutional-acquired) pneumonia particularly in elderly people with poor oral hygiene.<sup>34,35</sup> It is possible for plaque to be colonized by respiratory pathogens. Loss of immune function and the release of inflammatory cytokines may also play a role.<sup>35</sup> Oral health interventions ranging from toothbrushing to use of an antimicrobial have been shown to decrease the risk of lung infections.<sup>34</sup>

## Osteoporosis

The association between osteoporosis and periodontal disease is not well-defined. Some studies have shown low bone mineral density to be associated with alveolar bone loss while others have not.<sup>36,37</sup> It has been hypothesized that this disparity in findings may be due to the presence of known osteoporotic risk factors such as hormone action, heredity, and other host factors.<sup>36</sup>

Of more immediate concern has been the role that osteoporotic pharmaceuticals may have in osteonecrosis of the jaw (ONJ). In the last few years, cases of bisphosphonate-associated ONJ have been reported; particularly after invasive dental procedures such as an extraction. These cases have occurred in people with a history of intravenous bisphosphonate use related to the control of bone pain for various types of cancer. For oral bisphosphonates, the risk of ONJ is very low; approximately 0.7 cases per 100,000.<sup>38</sup> Two studies released in 2008 are in alignment with this. One found that IV but not oral bisphosphonate use was associated with an increased risk for ONJ.<sup>39</sup> The second found ONJ rare in postmenopausal women with osteoporosis.<sup>40</sup>

## Dementia and Disabilities

The biggest challenge facing many people suffering from dementia or disabilities is the ability to continue to seek care within a traditional dental setting. Depending on the nature or depth of the problems, many older individuals no longer drive and need to depend on caregivers to bring them to appointments. For those with advanced dementia, leaving home may not be feasible. Some may no longer even be able to perform simple oral hygiene procedures. Many long-term care facilities are not able to provide adequate or regular access on-site for dental care. As well, upon retirement, most lose coverage for dental insurance and Medicare does not reimburse for most dental services.

Regular professional and self-care are integral to the maintenance of good health and tooth retention. All individuals, including those that are edentulous need regular dental exams that include an oral cancer screening. With an increasingly older and well-educated population that values good oral health, professionals and policy-makers will need to join forces to develop new ways to deliver care to those that are home or institutional bound.

## Medications

Over 80% of adults take at least one prescription medication. For those over age 65, the percentage is even higher. Many also take non prescription drugs. Both can impact oral health. Xerostomia is a side effect in more than 400 medications. Other problems include aphthous ulcers, gingival enlargement, and bleeding abnormalities.<sup>41</sup>

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Xerostomia can cause both clinical and functional oral health problems. As the mouth dries, plaque increases and this may lead to an increase in caries particularly root surface decay. The saliva glands may become enlarged. It may be difficult to wear a denture. Functionally, severe xerostomia can make it hard to chew, swallow, or even talk.<sup>42</sup>

There are numerous over-the-counter products to help relieve xerostomia. These include oral rinses, gels, sprays, and artificial saliva. For more severe cases, prescription medications are available. It is common for people suffering from xerostomia to use gum, mints or lozenges; often containing sugar. This increases the risk for decay. Patient should be advised to only use sugar-free, non acidic products. Chewing gum containing xylitol may be an option. Depending upon oral health status, supplemental fluoride treatments may be required.<sup>42</sup>

## ORAL HEALTH INTERVENTIONS

Chronic health problems and disabilities can make daily care a challenge for many older individuals. Individuals with arthritis may not be able to use floss or any type of product that requires expert manual dexterity. People with poor or low vision may not be able to use a product that requires looking in a mirror to use. Hearing loss may be an impediment when providing self-care instructions.

### Power Toothbrushes

Power toothbrushes are an ideal brushing choice for those who have difficulty with home care devices. Handles tend to be larger than on manual brushes making them easier to grip. The mechanized action of the brush head allows the patient to focus only on placement thus reducing one of the variables associated with poor brushing. A power toothbrush may also be a good tool for a caregiver.

Sonic toothbrushes are a very popular type of power toothbrush (Photo 1). They have been shown to be effective in altering bacteria, reducing biofilm, stain, and gingivitis<sup>43-47</sup> One study found that three popular types of power toothbrushes, Waterpik® Sensonic® Professional Toothbrush (Water Pik, Inc., Fort Collins, CO), Sonicare® Elite, (Philips Oral Healthcare, Snoqualmie, WA) and Oral B® Sonic Complete (Procter & Gamble, Cincinnati, OH) and one manual brush to provide significant plaque removal.<sup>47</sup> See Table 5

Table 5: Percent Improvements in Plaque Reduction*			
Toothbrush Type	Whole Mouth	Marginal	Approximal
Waterpik® Sensonic® Professional Toothbrush (SR-1000W)	89%	81%	97%
Oral-B® Sonic Complete Toothbrush	82%	72%	91%
Sonicare® Elite (7800)	75%	62%	86%
Oral-B® Indicator (Soft Compact 35)	78%	66%	87%

\* adapted from Sharma et al<sup>53</sup>

### Interdental Aids

Most seniors need some type of interdental cleaning. Dental floss has long been the primary self-care recommendation made by most dental professionals. However, dental floss may not be the best product choice for older individuals because the dexterity required to use the product adequately may not be present.

Fortunately, there are some new alternative interdental aids, including power flossers that have been shown to be as effective, efficient, and even preferred alternatives to manual dental floss. Several studies have shown that alternatives to manual floss, such as flossing with a floss holder, interdental brushes, and power flossers can be just as effective at reducing plaque, gingivitis, and bleeding as manual floss.<sup>47,48,49,50</sup>

For seniors struggling with dexterity issues, products that require little hand coordination and do not need to go through the contact area may be ideal. A currently available power flosser (Waterpik® Power Flosser, Water Pik, Inc, Ft. Collins CO) has a single filament nylon tip. It has been shown to remove biofilm and reduce bleeding and gingivitis similar to manual floss.<sup>47,48</sup>



Photo 1: Waterpik® Sensonic® Professional Toothbrush Model SR-1000W



Photo 2: Waterpik® Power Flosser Model FLA-220

***The dental water jet may be an appealing device for seniors because it is easier to use and requires less dexterity than dental floss.***

### Dental Water Jets

Today's dental water jets feature a more contemporary design and are smaller and quieter than previous models. (Photos 3, 4) Newer models of dental water jets and new product research have revitalized interest in the benefits of the product. The dental water jet may be an appealing device for seniors because it is easier to use and requires less dexterity than dental floss. Those experiencing xerostomia may find that it can soothe dry tissue. Studies on the dental water jet have shown it is effective at reducing bleeding and gingivitis in numerous types of patients<sup>51-57</sup> including people with diabetes,<sup>54</sup> those with crown and bridge,<sup>57</sup> or non compliant with dental floss.<sup>55,56</sup>

The Waterpik® dental water jet with a standard jet tip has been found to be an effective alternative to dental floss. In a study conducted at the University of Nebraska, the dental water jet was paired with a manual or a power toothbrush and both were compared to traditional manual brushing and flossing. The addition of a dental water jet, once daily with plain water, to either a manual or power brushing routine was an effective alternative to dental floss for the reduction of bleeding, gingivitis, and plaque. It provided superior results in reducing inflammation with the dental water jet being up to 93% better at reducing bleeding and up to 52% better at reducing gingivitis over manual flossing. Significant improvements in oral health occurred regardless of toothbrush type, so it is likely that many patients currently using a power toothbrush may get further improvements in oral health by the addition of a dental water jet.<sup>55</sup> A 2008 study found that using a dental water jet with a specialized tapered brush tip (Photo 5) removed three times more plaque than floss with a floss threader and five times more plaque than brushing alone.<sup>56</sup>

Seniors with diabetes may have more bleeding and inflammation than others. One study found that the addition of the dental water jet to routine oral hygiene was 44% more effective in reducing bleeding on adults with diabetes than routine oral hygiene alone. Plaque and gingivitis were also significantly reduced as well as the serum levels of inflammatory mediators, interleukin - 1 beta (IL-1 $\beta$ ) and prostaglandin E<sub>2</sub> (PGE<sub>2</sub>). The findings indicate that the Waterpik® dental water jet is both safe and effective for people with type 1 or type 2 diabetes.<sup>54</sup>



Photo 3: Waterpik® Ultra Dental Water Jet Model WP-100W

**.....the addition of the dental water jet to routine oral hygiene was 44% more effective in reducing bleeding on adults with diabetes than routine oral hygiene alone.<sup>54</sup>**

Photo 4: Waterpik® Ultra Cordless Dental Water Jet Model WP-450W



Photo 5: Orthodontic Tip

## Conclusion

Baby Boomers and Seniors will experience improved health and greater longevity than previous generations. Yet, many will live with chronic disease or disabilities that can impact their mobility and social functioning. The need for oral care will continue. Dental professionals will be called upon to help older individuals find new pathways to care as well as continue to dispense oral hygiene advice.

## References

1. He W et al. US Census Bureau, Currently Population Reports, P23-209, 2005, 65+ in the United States: 2005, US Government Printing Office, Washington DC, 2005.
2. Demographics of Age; [www.transgenerational.org](http://www.transgenerational.org) Accessed on 01-21-08
3. Rosamond W et al. Heart disease and stroke statistics 2008 Update: A report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation*; DOI: 10.1161/CIRCULATIONAHA.107.197998. Accessed 12-18-07.
4. National Diabetes Fact Sheet. United States, 2005. Department of Health and Human Services. Centers for Disease Control and Prevention. Available at: [www.cdc.gov/diabetes](http://www.cdc.gov/diabetes). Accessed 12-13-07.
5. Distribution of age at diagnosis of diabetes among adult incident cases aged 18 - 79 years, United States 2005. Centers for Disease Control. [www.cdc.gov/diabetes/statistics/age](http://www.cdc.gov/diabetes/statistics/age) Accessed 02-05-08
6. Gregg EW, Brown A. Cognitive and physical disabilities and aging-related complications of diabetes. *Clinical Diabetes* 2003; 21(3):113-118.
7. Donahoe SM et al. Diabetes and mortality following acute coronary syndromes. *JAMA* 2007; 298(7):765-775.
8. Wackers FJ et al. Detection of silent myocardial ischemia in asymptomatic diabetic subjects. *Diabetes Care* 2004; 27(8):1954-1961.
9. US Department of Health & Human Services; Overweight and obese: At a Glance. [www.surgeongeneral.gov/topics/obesity](http://www.surgeongeneral.gov/topics/obesity) Accessed on 02-05-08.
10. Ogden CL et al. Prevalence of overweight and obesity in the US, 1999-2004. *JAMA* 2006; 295(13):1549-1555.
11. Peeters A et al. Obesity in adulthood and its consequences for life expectancy: A life-table analysis. *Ann Intern Med* 2003; 138:24-32.
12. Trends in COPD (Emphysema and Chronic Bronchitis.): Morbidity and Mortality; American Lung Association Epidemiological and Statistics Unit Research and Programs Services. December 2007. [www.lungusa.org](http://www.lungusa.org) Accessed 02-06-08.
13. Basics of Alzheimer's Disease: What it is and what you can do. *Alzheimer's Association* 2005. [www.alz.org](http://www.alz.org) Accessed on 02-06-08.
14. Dellara TF et al. Disentangling the roles of disability and morbidity in survival to exceptional old age. *Arch Intern Med* 2008; 168(3):277-283.
15. National Osteoporosis Foundation: Fast Facts. [www.nof.org](http://www.nof.org) Accessed 02-19-08.
16. Arthritis Facts: Arthritis Foundations. [www.arthritis.org](http://www.arthritis.org) Accessed 02-19-08.
17. Arthritis: Data and Statistics: Centers for Disease Control. [www.cdc.gov/arthritis/data\\_statistics](http://www.cdc.gov/arthritis/data_statistics) Accessed 02-19-08.
18. Targeting Arthritis Reducing Disability for Nearly 10 Million Americans. Centers for Disease Control. [www.cdc.gov](http://www.cdc.gov) Accessed 02-20-08.
19. Vision Problems in the US. 2002. Prevent Blindness in American and the National Eye Institute. Available at [www.usvisionproblems.org](http://www.usvisionproblems.org) Accessed 02-27-08
20. Parmet S. JAMA Patient Page: Adult Hearing Loss. *JAMA* 2007; 298(1):130. Available online at [www.jama.com](http://www.jama.com) Accessed 2-27-08
21. Khader YS et al. Periodontal diseases and the risk of coronary heart and cerebrovascular diseases: A meta-analysis. *J Periodontol* 2004; 75:1046-1053.
22. Dietrich T, Garcia RI. Associations between periodontal disease and systemic disease: Evaluating the strength of the evidence. *J Periodontol* 2005; 76:2175-2184.
23. Loos B. Systemic markers of inflammation in periodontitis. *J Periodontol* 2005; 76:2106-2115.
24. Genco R et al. A proposed model linking inflammation to obesity, diabetes, and periodontal infections. *J Periodontol* 2005; 76:2075-2084.
25. Beck JD, Offenbacher S. Systemic effects of periodontitis and epidemiology of periodontal disease and cardiovascular disease. *J Periodontol* 2005; 76:2089-2100.
26. Demmer RT, Desvarieux M. Periodontal infections and cardiovascular disease: The heart of the matter. *JADA* 2006; 137:145-205.
27. Mealey BL, Oates TW. Diabetes mellitus and periodontal disease. *J Periodontol* 2006; 77:1289-1303.
28. Genco RJ et al. A proposed model linking inflammation to obesity, diabetes, and periodontal infections. *J Periodontol* 2005; 76:2075-2084.
29. Taylor GW et al. Severe periodontitis and risk for poor glycemic control in patients with non-insulin dependent diabetes mellitus. *J Periodontol* 1996; 67:1085-1093.
30. Saremi A et al. Periodontal disease and mortality in type 2 diabetes. *Diabetes Care* 2005; 28(1):27-32.
31. Shultis WA et al. Effect of periodontitis on overt nephropathy and end-stage renal disease in type 2 diabetes. *Diabetes Care* 2007; 30(2):306-311.
32. Grossi S et al. Treatment of periodontal disease in diabetics reduces glycated hemoglobin. *J Periodontol* 1997; 68:713-719.
33. Scannapieco FA, Ho AW. Potential associations between chronic respiratory disease and periodontal disease: Analysis of National Health and Nutrition Examination Survey III. *J Periodontol* 2001; 72:50-56.
34. Scannapieco FA et al. Associations between periodontal disease and risk for nosocomial bacterial pneumonia and chronic obstructive periodontal disease. A systematic review. *Ann Periodontol* 2003; 8:54-69.
35. Azarpazhooh A, Leake JL. Systematic review of the association between respiratory diseases and oral health. *J Periodontol* 2006; 77:1465-1482.
36. Borrell LN, Papapanou PN. Analytical epidemiology of periodontitis. *J Clin Periodontol* 2005; 32(Suppl 6):132-158.
37. Geurs N. Osteoporosis and periodontal disease. *Periodontology* 2000 2007; 44:29-43.
38. Dental management of patients receiving oral bisphosphonate therapy: Expert Panel Recommendations. *JADA* 2006; 137:1144-1150.
39. Castos VM et al. Bisphosphonate use and the risk of adverse jaw out comes: A medical claims study of 714,217 people. *JADA* 2008; 139:23-30.
40. Grbic JT et al. Incidence of osteonecrosis of the jaw in women with post menopausal osteoporosis in the Health Outcomes and Reduced Incidence with Zoledronic Acid Once Yearly Pivotal Fracture Trial. *JADA* 2008; 139:32-40.
41. Ciancio SG. Medications: A risk factor for periodontal disease diagnosis and treatment. *J Periodontol* 2005; 76:2061-2065.
42. Fox PC. Xerostomia: recognition and management. *Access* 2008; February (Suppl):1-7.
43. Blanco VL et al. In vitro effect of the SenSonic® toothbrush on *Treponema denticola*. *J Clin Periodontol* 1997; 24: 318-323.
44. Barnes C. A clinical evaluation of the effect on gingivitis and plaque reduction of the SenSonic® plaque removal instrument. Abstract presented at ADHA Annual Session, 1995.
45. Hefferren J et al. Assessment of the stain removal cleaning power of the SenSonic® plaque removal instrument in beagles. *J Dent Res* 1996;75:86.
46. Sharma NC et al. Evaluation of the plaque removal efficacy of three power toothbrushes. *J Int Acad Periodontol* 2006; 8:83-88.
47. Anderson NA et al. A clinical comparison of the efficacy of an electromechanical flossing device or manual flossing in affecting interproximal gingival bleeding and plaque accumulation. *J Clin Dent* 1995; 6:105-107.
48. Shibly O et al. Clinical evaluation of an automated flossing device versus manual flossing. *J Clin Dent* 2001; 12:63-66.
49. Kleber CJ, Putt MS. Formation of flossing habit using a floss-holding device. *J Dent Hyg* 1990; 64:140-143.
50. Christou V et al. Comparison of different approaches of interdental oral hygiene: Interdental brushes versus dental floss. *J Periodontol* 1998; 69:759-764.
51. Newman MG et al. Effectiveness of adjunctive irrigation in early periodontitis: Multi-center evaluation. *J Periodontol* 1994; 65:224-229.
52. Flemmig TF et al. Adjunctive supragingival irrigation with acetylsalicylic acid in periodontal supportive therapy. *J Clin Periodontol* 1995; 22:427-433.
53. Cutler C et al. Clinical benefits of oral irrigation for periodontitis are related to reduction of pro-inflammatory cytokine levels and plaque. *J Clin Periodontol* 2000; 27:134-143.
54. Al-Mubarak S et al. Comparative evaluation of adjunctive oral irrigation in diabetes. *J Clin Periodontol* 2002; 29:295-300.
55. Barnes CM et al. Comparison of irrigation to floss as an adjunct to toothbrushing: Effect on bleeding, gingivitis and supragingival plaque. *J Clin Dent* 2005; 16(3):71-77.
56. Sharma NC et al. Effect of a dental water jet with orthodontic tip on plaque and bleeding in adolescent patients with fixed orthodontic appliances. *Am J Ortho Dentofacial Orthop* 2008; 133(4):565-571.
57. Krajewski J et al. Evaluation of a water pressure cleaning device as an adjunct to periodontal treatment. *J Amer Soc Periodont* 1964; 2:76-78.

# POST TEST COURSE #08-11

## Boomers and Seniors:

### Living Longer, Living Healthier Considerations for Dental Professionals

- 1. By 2030, the number of US adults 65 and older is expected to:**
  - a) Remain the same
  - b) Double
  - c) Triple
  - d) Quadruple
- 2. Seniors with the highest educational level are most likely to:**
  - a) Retire early
  - b) Report the poorest health
  - c) Stay in the workforce the longest
  - d) Die at an earlier age
- 3. What percentage of people over age 65 live in a nursing home?**
  - a) 14.2%
  - b) 9.7%
  - c) 7.9%
  - d) 4.5%
- 4. Which statement is true?**
  - a) Heart disease kills more men than women
  - b) Heart disease kills more women than men
  - c) Heart disease is the number one leading cause of death in men and women
  - d) Heart disease is the 2nd leading cause of death in men and women
- 5. Diabetes affects how many people over the age of 65?**
  - a) 10.5%
  - b) 20.9%
  - c) 31.2%
  - d) 36.8%
- 6. The two most common forms of Chronic Obstructive Pulmonary Disease are:**
  - a) Emphysema and Chronic bronchitis
  - b) Emphysema and nosocomial pneumonia
  - c) Chronic bronchitis and lung cancer
  - d) Noscomial pneumonia and lung cancer
- 7. Women who have had a hip fracture are \_\_\_ times more likely to experience a second hip fracture.**
  - a) 4
  - b) 6
  - c) 8
  - d) 10
- 8. Arthritis is the number \_\_\_\_ cause of work disability.**
  - a) 1
  - b) 2
  - c) 4
  - d) 6
- 9. Vision and hearing impairment is a risk factor for:**
  - a) Social isolation
  - b) Falls
  - c) Depression
  - d) All of the above
- 10. Which is the most common oral side effect for over 400 medications?**
  - a) Herpes virus
  - b) Lichen planus
  - c) Xerostomia
  - d) Glossitis
- 11. Osteonecrosis of the jaw (ONJ) has been associated with:**
  - a) Intravenous Bisphosphonates
  - b) Oral Bisphosphonates
  - c) Non steroidal anti-inflammatory agents
  - d) Statin lowering drugs
- 12. Periodontal disease and cardiovascular disease share which risk factors?**
  - a) Smoking
  - b) Diabetes
  - c) Obesity
  - d) All of the above
- 13. Which factor seems to be the stronger predictor of how well an individual with diabetes responds to periodontal therapy?**
  - a) How long they have had the disease
  - b) Whether they have type 1 or type 2
  - c) Their level of glycemic control
  - d) How much insulin they take
- 14. A dental water jet with a specialized tapered brush tip removed how much more plaque than using floss with floss threader?**
  - a) 2
  - b) 3
  - c) 4
  - d) 6
- 15. A dental water jet is an effective alternative to dental floss for reducing:**
  - a) Bleeding
  - b) Gingivitis
  - c) Plaque
  - d) All of the above

## OBTAINING CONTINUING EDUCATION CREDITS

Water Pik, Inc is designated as an Approved PACE Program Provider by the Academy of General Dentistry. The formal continuing education programs of this provider are accepted by the AGD for Fellowship, Mastership, and membership maintenance credits. Approval does not imply acceptance by a state or provincial board of dentistry. The current term of approval extends from 06/01/2006-05/31/2010.

### Credits: 3 hours

If you have questions about CE requirements in your state or province, please consult your regulatory board.

### Directions:

- Fill out the Water Pik, Inc. CE Registration Form and Answer Sheet.
- Answers should be logged on the answer sheet. Please make a copy of your answer sheet to retain for your records
- Answers left blank will be graded as incorrect.
- Please fill out the course evaluation portion.
- Submit your answer sheet via mail or fax to:

Carol Jahn, RDH, MS  
Manager, Professional Education  
and Communications  
Water Pik, Inc  
1730 East Prospect Road  
Fort Collins CO 80553  
Fax: 630-393-4706

### Scoring:

In order to receive credit, you must answer correctly 10 questions out of 15

### Results:

Will be mailed in 8-10 weeks.

### Questions:

Please contact Carol Jahn, RDH, MS at [cjahn@waterpik.com](mailto:cjahn@waterpik.com) or 630-393-4623

## CE REGISTRATION FORM AND ANSWER SHEET

### Course # 08-11

#### Boomers and Seniors:

#### Living Longer, Living Healthier Considerations for Dental Professionals

Name: \_\_\_\_\_  
Credentials: \_\_\_\_\_  
Street Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Daytime Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

### Answer Sheet

Please circle/highlight the correct answer for each question.

1.	a	b	c	d
2.	a	b	c	d
3.	a	b	c	d
4.	a	b	c	d
5.	a	b	c	d
6.	a	b	c	d
7.	a	b	c	d
8.	a	b	c	d
9.	a	b	c	d
10.	a	b	c	d
11.	a	b	c	d
12.	a	b	c	d
13.	a	b	c	d
14.	a	b	c	d
15.	a	b	c	d

### Course Evaluation

Circle your response: 1 = lowest, 5 = highest

Course objectives were met

1      2      3      4      5

Content was useful

1      2      3      4      5

Questions were relevant

1      2      3      4      5

Rate the course overall

1      2      3      4      5

How did you acquire this course:

Internet   DVD   Tradeshow   Other: \_\_\_\_\_