

**FACULTY GUIDE**

**Core Module 16:**

**Dentistry and Dementia**

May 2017

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**Slide 1:**

- This is the final module of a 16-module set, designed to cover a broad range of topics about dementia in greater detail, from the perspective of an interprofessional team approach. In this module we will discuss the unique challenges and opportunities of dentistry with Persons Living with Dementia (PLWD).

**Slide 3:**

- This module will address topics vital to the oral health and care of persons living with Alzheimer's disease and related dementias, including appropriate dental care strategies and special considerations when working with this population.

**Slide 4:**

- Module 16 addresses oral health maintenance and oral disease recognition and management. By the end of this module, participants will be able to describe the impact that oral health can have on systemic health and on the quality of life of PLWD, describe medical complexities that may have an impact on the PLWD's oral health or their ability to receive dental care, identify clinically significant oral health changes often observed in PLWD and make appropriate referrals; and discuss, apply and/or teach oral health care maintenance strategies to PLWD and their caregivers.

**Slide 5:**

- Dental disease in a PLWD can cause a diversity of challenging behaviors due to the person's inability to verbally communicate the discomfort being experienced. For this reason and due to the relative scarcity of dental professionals in long term care settings, other members of the health care team should become familiar with the techniques and most likely findings of intraoral examinations so oral disease can be ruled out as a cause of non-oral challenging behaviors that arise.
- Dental care for PLWD is made more difficult by challenging behaviors, poor self-care, limited finances, limited access to care, elevated likelihood for coincident medical conditions that make dental care more complex, and the complexity of the dental care that is likely to be needed by a person whose dentition has been in use and repeatedly restored over a lifetime.
- A PLWD should be dentally evaluated and treated as early as possible in the disease state, in order to provide care that is most consistent with the patient's wishes; reduce the possibility of adverse reactions to the intervention; and instill preventive behaviors (including the acceptance of daily oral care provided by another person) while the patient is able to become accustomed to them.
- The single most important dental intervention for PLWD is thorough daily oral hygiene followed (if the person has natural teeth) by application of fluoride gel.

**Slide 6:**

- Even in the advanced stages of dementia, oral disease may have a significant effect. Inaba, Young and Shields (2011) describe an 85-year-old person with advanced stages of Alzheimer's

disease who developed new-onset challenging behaviors—biting and hitting care givers, biting his own hand and cutlery, spitting, and weight loss.

**Slide 7:**

- After repeated physical examinations and medication changes resulted in no improvement, he was referred to a dentist. Three diseased teeth were extracted under general anesthesia, and the patient ceased the acquired antisocial behaviors of hitting, biting, and spitting. Early identification and treatment of his oral disease may have saved the patient unnecessary pain.

**Slide 8:**

- Residents of nursing homes were interviewed about how their oral health affected their lives. Since only about one-half were able to complete the quality of life assessment due to levels of cognitive impairment, the results represent only the patients who remained relatively cognitively intact and probably underrepresent the actual impact.
- Quality of life may be substantially affected by oral health status—the ability to eat comfortably, speak, smile, and be free from pain. Nearly 30 percent of residents in a long term care facility study reported having difficulty eating and 18 percent reported a recent history of pain. However, only about half of the residents were able to complete the quality of life assessment due to cognitive impairment, so the results probably underrepresent the actual impact.
- **Reference:** (Porter et al., 2015)

**Slide 9:**

- More than 60 percent of nursing home residents with teeth and 50 percent of those without teeth reported oral problems from loose or ill-fitting dentures, dry mouth, dental pain and sensitivity, and broken teeth.
- **Reference:** (Porter et al., 2015)

**Slide 10:**

- Perhaps because dentistry, as a profession, developed independently from medicine, the mouth became an organ viewed separately from the body. With a growing body of evidence demonstrating bi-directional associations between oral health and systemic health, this presentation addresses key links that are particularly relevant for persons living with dementia.

**Slide 12:**

- Most people living with dementia are older adults. Often these individuals have additional chronic illnesses or conditions that are prevalent in people of advanced age and that may need to be managed.
- Due to concerns with access to dental care, or due to difficulties maintaining regular oral health, PLwD may be at increased risk of complications from suboptimal oral health.
- In addition, communication concerns are common. A person living with dementia may not be able to recognize or to express a problem with oral health or symptoms of incipient oral disease. The primary care team, including primary care providers, other allied health professionals and the direct service workforce, need to be informed of the potential oral health implications of

non-oral disease and their treatments, and should be involved in monitoring oral health with PLwD and their care partners.

**Slide 13:**

- Most persons living with dementia are older, and all of these risk factors are observed in older persons to a far greater degree than in younger populations.

**Slide 14:**

- Swallowing dysfunction becomes far more common in persons with PLwD as the disease progresses, making aspiration of oral contents an increasing threat.
- With impaired oral hygiene, the potential for infectious material to be drawn into the lungs becomes far more dangerous. The pathogenicity of the oral microbial environment rapidly supports organisms in the environment, making aspiration in hospitals and long term care facilities particularly concerning.

**Slide 15:**

- Poor glycemic control and diabetes are both significant risk factors for cognitive dysfunction. Persons living with dementia who also have impaired glycemic control or diabetes are at elevated risk for hyperglycemia due to impaired understanding of the importance of appropriate diet and scheduling.
- Impaired oral hygiene predisposes to periodontal inflammation, which in turn makes diabetic and glycemic control more difficult—and these in turn increase the body's inflammatory reaction to periodontal pathogens.

**Slide 16:**

- Anticoagulants are commonly used in persons living with dementia, as part of managing other health conditions. Yet anticoagulants may increase the chance of hemorrhage after mucosal trauma. In most cases the benefits of anticoagulants for management of thrombosis and other conditions, outweighs the risk of hemorrhage during oral trauma.

**Slide 17:**

- Over 95% of intraoral and oropharyngeal malignancy is squamous cell carcinoma, a cancer found almost exclusively in people age 50 and older. Ionizing irradiation plus excision and (if there is nodal involvement) chemotherapy is the treatment of choice. Therapeutic irradiation that passes through bone (particularly the more vascular mandible) and salivary gland tissue causes irreversible fibrosis of microvasculature, resulting in irreversibly impaired bone healing and partial or total destruction of salivary glands. Impaired salivary supply leads to rapidly destructive dental caries; and avascular bone is highly susceptible to osteonecrosis arising from tooth extraction.
- Persons living with dementia undergoing irradiation therapy for oral cancers must have a thorough dental assessment and extraction of teeth at risk for caries prior to starting irradiation. Intensive dental follow-up is crucial after completion of therapy.

**Slide 18:**

- Prevention of osteonecrosis is far more successful than treatment, particularly in a person living with dementia. Intravenous administration of bisphosphonates (BP) for management of multiple myeloma has been linked to a small (<5%) but definite risk for osteonecrosis following intraoral trauma.

**Slide 19:**

- In this section we will discuss considerations in antibiotic prophylaxis prior to dental care, and the current guidance for decision-making.

**Slide 20:**

- Many decades of overuse of antibiotics has resulted in the emergence of drug resistance. Although management of an infection due to orally-seeded pathogens can be challenging, the rarity of this occurring must always be weighed against the greater population harms resulting from irresponsible use of antibiotics. Bacteremia of oral origin has been documented following daily oral hygiene—and substantially higher titers are reported following professional dental care and especially following dental extractions and other oral surgical procedures. Bacteremia of oral origin has been *anecdotally* linked to metastatic infections of multiple organs (e.g., kidney, brain, heart).
- For this reason, those with elevated risk for metastatic infection of oral origin (e.g., those with history of infective endocarditis, those with prosthetic heart valves or major joint replacements) need to be educated by their primary care teams on the importance of fastidious daily oral hygiene and regular dental care, in order to minimize the risk of metastatic infection due to an orally-seeded bacteremia.

**Slide 21:**

- Assessments by multiple health professional organizations have concluded that the risks of prophylactic broad-spectrum antibiotics (such as the emergence of resistant organisms) prior to dental care far outweigh the benefits in most cases, *including for those with a history of rheumatic heart valve disease and fully healed major joint prostheses.*
- There are several exceptions. For persons with a prosthetic heart valve, a history of infective endocarditis, or a prosthetic major joint replacement who are at risk for infection, the recommended regimen for these exceptions is a single dose, 30-60 minutes prior to a dental procedure anticipated to cause bleeding, of: 2g oral amoxicillin; or 2g IV or IM ampicillin; or 1g cefazolin or ceftriaxone IM or IV; OR
- for those allergic to penicillins or ampicillin: 2g oral cephalexin; or 600 mg clindamycin; or 500 mg azithromycin or clarithromycin; or 1g IM or IV cefazolin or ceftriaxone; or 600 mg IV or IM clindamycin.
- There are no compelling population-based data supporting the prophylactic administration of antibiotic prior to dental care for patients with other “devices”, such as arterio-venous shunts, ventriculo-peritoneal shunts, transdermal catheters, minor joint prostheses, penile prostheses, or esthetic augmentation implants.

**Slide 22:**

- In this section we will discuss the oral impact of medications, including side effects that affect production of saliva.

**Slide 23:**

- “Dry mouth” is one of the most frequently listed medication side effects, reported for a broad range of agents. “Dry mouth” is NOT a normal consequence of aging, but represents a significant and potentially destructive state that should be minimized whenever possible. “Dry mouth” is reflective in most cases of a change in salivary quantity and/or quality (e.g., electrolytic, antimicrobial, mucinous content).
- Saliva is enormously important as an intrinsic and multifactorial host defense. Saliva is a critically important exocrine fluid that protects and nurtures mucosa in the mouth and aerodigestive passages, lubricates and maintains the mineralization of teeth, and suppresses oropharyngeal microbial growth.
- Compromised salivary flow and production should be regarded as a seriously threatening condition rather than just a trivial somatic concern. Salivary modification and particularly its absence are accompanied by rampant acceleration in dental

**Slide 24:**

- Recognizing oral diseases and providing resources to support oral health maintenance are two critical roles for care providers. This module reviews the knowledge and skills needed for providers to assess the oral health status of persons living with dementia in order to make appropriate referrals, and to provide education for patients and caregivers regarding oral health maintenance and strategies for supporting oral health.
- To build the foundation for both, the steps for completing a quick but thorough assessment of oral health follow. The assessment begins outside the mouth with observation of the skin of the face, scalp and neck for changes and observation and palpation of nodes.

**Slide 25:**

- We will now discuss specific techniques and material needed in preparation for entering the mouth.

**Slide 26:**

- Prepare for an oral assessment by acquiring gloves, 2x2 gauze, a light source and disposable mouth mirrors. A flashlight or headlamp will work and the mouth mirrors are available at low cost. Tongue blades will work but not as well.

**Slide 27:**

- Begin your oral assessment *outside* the mouth. Observe the skin of the face, scalp, and neck. Then assess the nodes of the head and neck. Look first and then palpate, and assess for changes in color, texture, contour, consistency, symmetry, and function.

**Slide 28:**

- As you move toward the mouth, observe the lips and the corners of the mouth, where you will not infrequently observe angular cheilitis. Then, with thumbs and fingers, extend the lip to observe the labial mucosa. Again, look for changes in color, texture, contour, consistency, symmetry, and function. After observing, palpate bi-digitally and expect to feel minor salivary glands.

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**Slide 31:**

- The lateral border of the tongue is the most common site for oral cancer so it is critical to observe, and at the same time, difficult to visualize. Visual access is achieved by having patients extend their tongues and then by grasping the tongue with a 2x2 gauze to prevent it from slipping. Once the tongue is firmly grasped, it should be gently stretched first to one side and then to the other using care to minimize contact between the underside of the tongue and the lower teeth.

**Slide 32:**

- The floor of the mouth is the second most common site for oral cancer. In an oral cancer screening examination, changes in color, texture, contour, consistency, symmetry and function remain the elements to be observed.
- The highest level of suspicion is associated with lesions that have been present over time (although patients may be unaware of them), lesions without a known history such as a pizza burn, and lesions that are red or red and white mixed and have an indurated border.

**Slide 33:**

- The teeth are part of a complex structure of tooth and periodontium—the bone, the tissue connecting the tooth and bone, and tissue covering the bone. Questions to ask in observing the dentition include:
  - Are the teeth intact and clean? Are any missing?
  - Is the gingiva pink and healthy?

- Are the teeth solid or mobile? Is there recession of the gingiva?

**Slide 34:**

- Most persons living with dementia are older adults. We will now review oral disease common to older adults.

**Slide 35:**

- Diseases that are common in older adults are dental caries (tooth decay) and periodontal disease (a complex of diseases of the supporting structures of the teeth). Edentulism (the loss of teeth) is declining but tooth loss does increase with increasing age. Oral cancer is not common but is associated with high morbidity and mortality and age is a risk factor.

**Slide 36:**

- Dental caries is a transmissible microbial disease that results in the dissolution of calcified tooth structure of the crown or the root of the tooth, eventually progressing into the tooth creating a cavitation that can be observed clinically or radiographically.

**Slide 37:**

- The incidence and prevalence of caries in persons living with dementia is significantly higher than in community-dwelling older adults without dementia—reported to be three times the rate. Various studies report an average of more than five teeth with caries lesions in persons living with dementia independent of their living environment and as high as 89% having at least one lesion.

**Slide 38:**

- The surfaces of teeth, whether enamel on the crowns of teeth or exposed cementum on roots, undergo a constant dynamic mineral exchange with the oral environment.

**Slide 39:**

- Caries lesions occur when the microorganisms that colonize on the teeth metabolize carbohydrates and produce acids that demineralize the tooth structure to a greater degree than the calcium and phosphate ions in saliva can remineralize the tooth.

**Slide 40:**

- Caries risk is increased when plaque is left undisturbed, the patient frequently consumes fermentable carbohydrates, salivary flow is reduced, and/or roots are exposed. Regular brushing and fluoride use are protective factors and when absent the risk is increased.

**Slide 41:**

- Heavy plaque accumulation and diminished ability to independently perform oral hygiene procedures are associated with cognitive decline.



- Carbohydrate snacks are often made available to residents in long term care settings as treats and comfort foods, and because they are usually easy to chew and swallow for people with compromised dentition.
- Reduced salivary flow, in an older population, is most often caused by medications, and persons living with dementia are likely to be on multiple drying medications.
- Exposed roots are associated with periodontal disease, and the accumulated effects of chronic periodontal disease over time will result in roots that are at risk.
- Access to the beneficial effects of fluoride depends on access to dental services, often lacking in this population.
- Most people with dementia are in the extreme high-risk category for dental caries.
- **References:** (Chen, et al., 2013; Dwyer et al., 2010; Foltyn, 2015; Ribeiro et al, 2012)

**Slide 42:**

- With a multifactorial disease, a many-pronged approach is required to attempt to control the disease beginning with decreasing the cariogenic plaque on the teeth.
- The first line is, of course, the toothbrush and many options are available.
- If the patient will tolerate it, the electric brush does provide movement of the bristles, but the sensation may not be tolerated. Brush handles may need to be adapted to enhance the ability to grasp them or bristle-design selected to maximize the surfaces in contact with the brush.

**Slide 43:**

- Now that we have discussed the oral diseases common to older adults, we will move to the review of methods for assisting with oral hygiene.

**Slide 44:**

- For persons living with dementia who require assistance with oral hygiene, techniques will vary depending on the ability of the person living with dementia to cooperate.
- A strategy that often works to assist with brushing is to begin by standing behind the person living with dementia and either supporting the heads with their non-dominant hands or resting it firmly on the shoulder on the side to be brushed to divert their attention.

**Slide 45:**

- Place a soft-bristled brush (either manual or electric) with the bristles pointing into the gingival tissue at a 45° angle to the teeth and vibrate or create small circles. Then move to the next site.
- If this level of brushing is simply not allowed by the person living with dementia, aids like the Collis-Curve brush shown on the right side of the slide may help to cover more tooth surface with each attempt.

**Slide 46:**

- Tooth brushing needs to be supplemented with aids to clean between the teeth. Although floss is the gold standard, anything that safely cleans between the teeth is encouraged.
- Flossing is most easily accomplished from the front of the person living with dementia. A flossing device may protect the care provider from risk of biting. Many other devices for interproximal

cleaning are commercially available and may be easier to manage than floss and may actually be more effective in older people.

**Slide 47:**

- Fluoride acts to reduce the risk of caries by facilitating remineralization (reversal) of early caries lesions, by rendering tooth mineral more resistant to dissolution in bacterially-excreted acid, and, in some cases, by impairing bacterial metabolism of carbohydrates into acid.
- Fluoride is available for delivery in four major forms, including community water fluoridation.

**Slide 48:**

- Fluoride has been added to some community water supplies since as early as 1949.
- Over-the counter-dentifrices and mouthwashes are readily available but little evidence supports their efficacy in high-risk patients.
- Professionally applied fluoride varnishes and prescription preparations at higher concentrations have demonstrated efficacy.

**Slide 49:**

- A prescription is required for 1.1% neutral sodium fluoride dentifrice or gel, and its use twice daily is recommended by the American Dental Association for patients at high risk for caries.
- The 2.26% fluoride varnish is recommended by the American Dental Association to be professionally applied every 3 months for high risk patients and the application of 38% silver diamine fluoride is recommended 1-2 times per year. Either product could be applied by primary care providers, where practice acts allow.

**Slide 50:**

- The patient was a World War II veteran who had been a prisoner of war in the Philippines. He had been treated in a VA Dental Clinic for many years and maintained an intact dentition. Declining cognitive function led to residence in a nursing facility. When he came to dental appointments, his teeth were completely covered with plaque and he began developing caries at an alarming rate.
- Efforts at encouraging the facility to provide more support for oral hygiene were unsuccessful. In response to the needs of this veteran, the staff at the dental clinic looked for a solution and decided to bring him into the clinic once a month, and an auxiliary staff member would brush his teeth and apply fluoride varnish.
- The strategy effectively decreased the rate of new caries for this veteran and he maintained a functioning dentition until his death. As a result of this outcome, the clinic established a program to provide this service for veterans who could no longer maintain oral health. The tooth brushing does not require the skills of a dental professional and the application of fluoride varnish is legal in many states in other health care settings.

**Slide 51:**

- In the next section, we will discuss the importance of salivary flow and the management of concerns in this area.

**Slide 52:**

- Saliva is critical to maintaining a healthy oral environment. It makes the ions for remineralization of the teeth available, initiates digestion, provides lubrication of tissues, assists with mastication and bolus formation, buffers, and has antibacterial, antiviral and antifungal activity.
- Xerostomia or salivary hypofunction is most often caused in persons living with dementia by medications, but other causes are autoimmune diseases, radiation therapy to the head and neck, salivary gland infection, obstruction, tumor or excision, and fluid and electrolyte problems.

**Slide 53:**

- As a complex bodily fluid that supports the health of the dentition and oral mucosa, salivary ***stimulation***, when physiologically feasible, is the most effective management tool. Salivary replacement will provide some comfort in eating, speaking and swallowing. Protecting the teeth with effective oral hygiene measures and use of agents such as fluoride will mitigate the increased risk associated with a dry mouth.

**Slide 54:**

- Salivary flow can be stimulated when functional salivary tissue exists by the use of sugarless gum and candy. The use of sugarless products is essential since sugar is one of the factors that contributes to dental caries. These products are sweetened with polyols such as xylitol and sorbitol. In addition to stimulating salivary flow, they replace fermentable carbohydrates with sweeteners of low cariogenicity and may have a direct anti-plaque effect.
- Sialagogues pilocarpine hydrochloride and cevimeline may be prescribed but use for medication-induced dry mouth would be an off-label use.

**Slide 55:**

- Salivary replacement is palliative rather than therapeutic but often provides considerable comfort for people with xerostomia. A cup that has a lid and is filled with ice and water is easy and convenient.
- Care partners and persons living with dementia should be advised to avoid sugared beverages that greatly increase the risk of oral diseases.
- Several manufacturers market artificial saliva and mouthwashes for persons with salivary hypofunction. The products may support speech, swallowing, and oral comfort by providing oral lubrication, but they do not possess the disease-suppression or disease-reversal properties of natural saliva.

**Slide 56:**

- Diet is the final caries risk factor that will be discussed.
- Reduction of risk requires minimizing the frequency of intake of fermentable carbohydrates and, where possible, replacing them with foods rich in proteins.

**Slide 58:**

- Diseases of the periodontium (the supporting structures of the teeth) arise in response to pathogenic microorganisms in dental plaque. The initial soft tissue reaction to plaque is gingival

inflammation with redness and bleeding usually termed gingivitis. This can be resolved by thorough cleaning of tooth surfaces.

- A variable blend of host and microbial factors may trigger the release of destructive inflammatory factors that irreversibly destroy hard and soft tissues surrounding affected teeth resulting in periodontitis. In the advanced stages of periodontitis disease, the teeth become mobile and may eventually be lost, impairing the ability to chew.

**Slide 59:**

- Advanced periodontal disease is more common with advanced age because of the accrual of tissue loss over the life span and results in extensive exposure of roots discussed earlier in this presentation. Diminished or absent oral self-care of persons living with dementia places them at elevated risk for gingival and periodontal diseases, and makes it imperative that daily oral hygiene is faithfully and effectively provided by caregivers.

**Slide 60:**

- Over 45,000 new cases of oral cancer are diagnosed per year in US, mostly in individuals age 50 and over with a male preponderance. The most common sites are the base and lateral borders of the tongue and the floor of the mouth, and it is associated with tobacco/heavy alcohol use and human papilloma virus.
- Remember that red and mixed red/white lesions demand immediate evaluation by an oral health professional.
- Although white lesions are less likely to be malignant, potential causes should be addressed and the lesion re-evaluated. The prognosis is more favorable when the disease is identified early when localized.

**Slide 61:**

- Prior to better understanding of oral disease and widespread access to preventive dentistry, the chronic and progressively destructive nature of caries and periodontitis did lead to widespread total tooth loss with advancing age.
- However total tooth loss declined significantly in the United States in the second half of the 20<sup>th</sup> century due to fluoridated drinking water and dentifrice and increased access to increasingly sophisticated dental care.
- Presently toothlessness affects less than 25% of Americans aged 75 and over. However, in the U.S. it still persists in rural areas, southeastern states and among recent immigrants and groups with less education, lower financial status, and less access to preventive dental care.
- The *prevalence* of edentulousness among persons living with dementia is little different than what is observed among age-matched, non-ADRD populations.
- Incidence of toothlessness is greater in persons living with dementia due to impaired self-care and the likelihood for dental professionals to opt for extracting diseased teeth.

**Slide 62:**

- Artificial dentitions, or “dentures,” are an alternative to being toothless—they are NOT a substitute for teeth, except in a superficial, esthetic manner.

- Edentulousness is not clearly correlated with suboptimal nutritional intake, particularly in industrialized nations with widely available processed foods. Eating ability with dentures is better than without dentures—but only slightly so. Providing dentures to edentulous persons may anecdotally lead to improved dietary intake, but population-based studies of this question are not compelling.
- Dentures do not change appreciably with time, but once teeth have been removed from the jaws, the alveolar processes (the bone in the jaws that held the teeth) diminish in volume at a variable rate over the ensuing years and the tissues on which they rest gradually diminish in contour over months and years. For this reason, dentures periodically need to be adjusted and as well as remade during the wearer’s life or they will begin to damage mouth structures This means that dentures usually require periodic adjustment and remaking several times during the wearer’s life.
- Adapting to and using dentures requires a level of tolerance, learning, and orofacial neuromuscular proprioception and control that a cognitively impaired individual may or may not still possess to an adequate degree.

**Slide 63:**

- Denture care for persons living with dementia requires careful consideration and planning.

**Slide 64:**

- Like teeth, dentures in the mouth are readily and copiously populated with adherent microbial colonies. Unlike teeth, dentures preferentially support yeast colonies. For this reason, dentures should be brushed at least daily. If a dentifrice is used, it must be less abrasive than toothpaste. Dentures should be left out of the mouth for some part of every day, to allow the oral mucosa to recover and aerate. Often the most convenient time for this is during sleep.
- While dentures are out of the mouth, they should be stored in clean water or denture soaking solution. Soaking dentures in a cleansing solution without mechanical cleaning either before or after does not clean dentures adequately. If using soaking solution overnight (generally a mildly proteinolytic detergent with sodium hypochlorite) on behalf of a person living with dementia, do not permit the individual access to the soaking denture. This is to reduce the chance for either accidental ingestion of the solution or mucosal burns arising from inserting a denture from which the solution has not been rinsed.

**Slide 65:**

- For persons living with dementia in nursing homes, assisted living, or other congregate settings, take care to label the denture. Labels can be placed during or after fabrication. Misplacement of the denture is not uncommon, due to increasing confusion and short-term memory deficits. Clear labeling will reduce the risk of losing the denture.

**Slide 66:**

- Planning and delivering dental care to persons living with dementia can be challenging emotionally, ethically, and technically. The approach ultimately chosen will need to be selected by the patient, which in most cases requires input from the care partner/surrogate decision-maker, and the health care team.

- The following slides describe factors that impact the final decision on dental treatment options for persons living with dementia. No one consideration stands above others; any of these may be the overriding factor at one point but may yield to another as time passes and the situation changes:

**Slide 67:**

- Dental assessment and early intervention become increasingly important in the care of persons living with dementia.

**Slide 68:**

- Dental assessment and intervention early in the course of cognitive decline is important in order to determine patient preferences and to instill preventive behaviors. Dementias are progressive diseases that over time diminish a person's capacity for input to treatment decisions, self-care, and impulse suppression.
- Identification of patient priorities and preferences as early as possible during the neurological disease process will help inform later decision-making.
- Undertaking dental care that requires more patient cooperation, learning, and adaptation will become increasingly challenging with the passage of time. Initiation of daily oral care behaviors by the patient or by others on the patient's behalf must begin as soon as possible to limit progression and onset of disease.
- Even so, there are no guarantees that patient tolerance and cooperation earlier in the disease process will sustain over time.

**Slide 69:**

- Dental assessment and intervention early in the course of cognitive decline is important because the expenses and need for prolonged concentration only increase with the complexity of the dental care needed.
- For those on a fixed budget, dental care can be prohibitively expensive.
- Medicare does not include dental care and in many states adult Medicaid offers limited coverage or no coverage at all. Most employer-based dental insurance does not continue coverage into retirement.
- Financial barriers may limit care options to prevention, extractions, and fillings—making treatment of severely diseased teeth (e.g., root canal) or replacement of missing teeth out of the question.
- Most dental offices have limited capacity to accommodate patients in wheelchairs, adults who display aversive behaviors or who require conscious sedation to be treated.
- In addition, limited tolerance of unfamiliar settings by a person living with dementias may necessitate seeking services from dental personnel capable of rendering care in the home or extended care facility; or under general anesthesia in a hospital setting.

**Slide 70:**

- Dental patients who are PLWD may tolerate dental care in a typical office setting or may also react negatively to an unfamiliar setting. For some PLWD, the introduction of unexpected and

especially uncomfortable devices into their mouths, their own recumbent and vulnerable posture, and the necessary physical proximity of dental personnel can trigger aversive behaviors. These reactions may be mitigated if care is delivered in the patient's home or extended care facility.

- Dental personnel with advanced training in treating patients with aversive behaviors may be able to manage PLwD through verbal and non-verbal techniques to the point that routine dental care can be delivered successfully. These techniques apply as well in the patient's home or extended care facility.
- In consultation with the primary care team, some dentists will prescribe low-dosage oral benzodiazepine to facilitate cooperation during dental care. Some dentists have training in intravenous administration of sedative-hypnotics but all such agents carry risk for triggering a delirious episode that can be disturbing to staff, patients, and family.
- Nitrous oxide administration may not be tolerated due to the apparatus placed over the nose. Furthermore, the reduced oxygenation that is part of this procedure is riskier in a person of advanced age who is more likely to have subclinical or overt cardiovascular compromise.

**Slide 71:**

- Dental care involving fabrication of prosthetic tooth replacements (dentures and bridges) and other sophisticated dental procedures (root canal, periodontal surgery) requires patient cooperation and tolerance for dental procedures lasting over an hour.
- Adaptation to dentures can also be challenging even to persons without cognitive difficulties. Providing new dentures to PLwD always carries a significant risk that the prosthesis will be intolerable to the patient. Care must be taken to consider the PLwD's tolerance for complex procedures, as well as their potential adaptability to dentures.

**Slide 72:**

- Dental care can produce anxiety in a proportion of healthy adults but it is variable whether this reaction will be diminished, worsened, or unchanged by neurological deterioration.
- Untreated dental and oral disease can impede socialization due to diminished self-image, oral malodor, and change in personal appearance.
- Reduction in number of teeth is correlated with a diminishing range of tolerable foods. Although this does not presage starvation or even undernourishment, it does mean that whatever sensory enjoyment the person living with dementias once experienced from eating is likely reduced as the number of teeth is diminished.
- Development of a plan to address ongoing dental care in the person living with dementia ideally involves discussions with the affected individual and their care partner, early and often. The balance of what procedures and care the individual may or may not be willing to undertake to address oral health may change over time, and the goals may shift to reflect new realities and different quality of life needs as the dementia progresses.
- Dental care can be integrated with primary care approaches to optimize oral health within the context of dementia and in keeping with the quality of life goals of the person living with dementia.

**Slide 73:**

These items are provided to allow faculty to evaluate what students have learned. The items can be used in several ways including given at the end of the lecture to assess knowledge or as a pre-post test to assess knowledge gain. These items have face validity. Psychometric testing was not conducted on these items.

Answers:

1. d. All of the above
2. d. All of the above

**Slide 74:**

Answers:

3. b. Is less common today than it was during the twentieth century because the prevalence of total tooth loss at all ages has been steadily dropping in industrialized countries
4. a. Is a common occurrence due to the highly vascular nature of the oral cavity, the large number of microorganism's present, and the common occurrence of intraoral infections such as gingivitis and periodontitis due to compromised oral hygiene.