



Julie A Edwards

Liz Ford and Carole Boyle

# Dementia and Dentistry

**Abstract:** Dementia is increasing in prevalence: by 2025 it is estimated that there will be over a million people in the UK with this diagnosis. The condition is likely to affect us all as healthcare providers, whether in our patients, our relatives or ourselves. This article gives an overview of dementia: causes, treatment, how it affects people and provides advice on how to manage patients with dementia who require dental care.

**CPD/Clinical Relevance:** By identifying the patient with dementia and being aware of the challenges in providing care the clinician can provide better treatment and reduce the chance of dental problems as the condition progresses.

**Dental Update 2015; 42: 464–472**

Dementia is one of the biggest health challenges facing the NHS in the UK and is recognized as a global time bomb. It is estimated that there will be over a million people with dementia in the UK by 2025.<sup>1</sup> The G8 summit in London December 2013 made a commitment to 'significantly increase the amount spent on dementia research, to identify a cure, or a disease modifying therapy by 2025 and to develop an international action plan for research'. David Cameron announced care quality measures to improve the quality of care provided in hospitals for people with dementia.<sup>2</sup>

The ICD-10 defines dementia 'as a disorder with deterioration in both memory and thinking which is sufficient to impair personal activities of daily living. The impairment of memory is noted to typically affect the registration, storage and retrieval of new information. The definition requires that the patients have deficits in thinking

and reasoning in addition to the memory disturbance'.<sup>3</sup>

Currently dementia is underdiagnosed: fewer than half the people with the disease have a diagnosis. Early diagnosis means faster treatment, which can slow down progression of the disease. It is important to be aware that dementia is increasingly a chronic condition, with most people living in their own homes, and not all are elderly. Although most cases are recognized later in life, increasingly younger people, less than 65, are developing the condition. Dementia is not a natural part of ageing.<sup>4</sup>

## Impact on the dental team

Dementia is going to affect us all: either in the patients we treat, as sufferers ourselves or as carers for our loved ones. The dental team needs to be aware of the early signs and how to manage those in the middle and late stages of the disease. Careful treatment planning will be needed: thinking ahead to avoid providing complex restorative care, which cannot be maintained in the long term.

There is some work looking at an association between cognitive decline and oral health. Researchers suggest that less frequent toothbrushing and subsequent plaque accumulation are early indicators of

cognitive decline.<sup>5</sup> The dental team might spot this change in oral health behaviour before a family recognizes memory loss.

## Diagnosis

Diagnosis of dementia requires the person to exhibit changes in cognition, function and personality for at least a year.<sup>6</sup> Changes in cognitive function alone indicate a diagnosis of mild cognitive impairment (MCI). Fifty percent of people diagnosed with MCI will go on to develop dementia; the other 50% will not progress, or even improve.<sup>7</sup> The term dementia describes a syndrome: a range of symptoms, which combine to make an overall clinical picture. There are over 100 different specific conditions which can cause a person to have a dementia.

The ideal route to diagnosis, following NICE Guidance (2014), starts with patients presenting to their GP with a 12-month history of memory loss which severely affects their day-to-day life. A comprehensive history is taken at this point, with the assistance of a carer or relative for clarity.<sup>8,9</sup> There are several short cognitive exams that can be performed by the GP. These can be found in 'Helping you to assess cognition'.<sup>6</sup> The following bloods should be taken to rule out other causes of confusion: routine haematology and biochemistry;

**Julie A Edwards**, Specialist in Special Care Dentistry, **Liz Ford**, Dementia and Delirium Clinical Nurse Specialist and **Carole Boyle**, Consultant in Special Care Dentistry, Guy's and St Thomas' NHS Foundation Trust, Floor 26, Tower Wing, Great Maze Pond, Guy's Hospital, London SE1 9RT.

thyroid function; serum vitamin B<sub>12</sub> and folate. Mid-stream urine, chest X-ray, ECG and bloods for HIV and syphilis should be considered if indicated in the clinical history.<sup>8</sup> At this point, referral to a specialist memory service should be made. They will perform further cognitive testing, screen patients for depression, review medication, and possibly perform neuropsychological testing. Brain scanning, MRI for preference, is then performed to rule out other causes of the cognitive symptoms and to diagnose the dementia sub-type. Following diagnosis, the Memory Clinic will give information and refer on to local services as required.

In reality, the pathway to diagnosis rarely runs this smoothly. People in the early stages of dementia may not realize their deficits, pass them off as 'old age', or fear an unwanted diagnosis; all of which may mean that they do not present to their GP. Often changes are noticed by relatives, who then struggle to persuade the affected person to seek help. The Alzheimer's Society can be a source of support and advice for carers in this situation. An even greater challenge can be accessing people who live alone, with limited contact with people who would notice a change.

As a dentist you may find yourself seeing a patient with obvious confusion but no diagnosis of dementia, or with a carer asking you for advice as to what to do as a healthcare professional. You should contact his/her GP highlighting concerns and requesting a review. The current National Dementia QUIN (Commissioning for Quality and Innovation) requires acute hospital trusts to screen all emergency admissions over the age of 75 for memory problems.<sup>10</sup> This may be extended to outpatient and community services in the future. The national diagnosis rate for dementia is 42%, which means a staggering 58% of people living with a dementia receive no formal diagnosis. It is estimated that one in three of us will have some form of dementia when we die.<sup>11</sup>

## Types of dementia (Table 1)

### Alzheimer's Disease

The commonest and most well known form of dementia is Alzheimer's Disease (AD), which accounts for 60% of

all dementia diagnoses.<sup>12</sup> People with AD typically present with short-term memory loss and word-finding difficulties. As AD progresses people can become more confused, forgetting names of people and places, appointments and recent events. They may experience mood swings and frustration, and become more withdrawn, possibly due to loss of confidence or communication problems. Everyday activities, such as using a phone or TV remote will become more challenging.<sup>13</sup>

Anti-cholinergic therapy has been shown to be effective in early to moderate AD. *Donepezil (Aricept)* is the NICE recommended first drug of choice. There is a strict protocol involving a drug holiday to prove efficacy, which must be adhered to. *Rivastigmine* and *Galantamine* are also available, with *Memantine* for more moderate disease. There is also anecdotal evidence of *Memantine* being effective in the treatment of behavioural disturbances in moderate to advanced dementia. The most frequent side-effects of *Donepezil*, *Rivastigmine* and *Galantamine* are loss of appetite, nausea, vomiting and diarrhoea. Other side-effects include stomach cramps, headaches, dizziness, fatigue and insomnia.<sup>14</sup>

### Vascular dementia

This form of the disease is caused by 'furring' up of the small blood vessels in the brain (similar to coronary artery disease). People with vascular dementia are often diagnosed after a stroke, or series of Transient Ischaemic Attacks (TIAs). Here deterioration is often stepwise, and linked to cerebrovascular changes in the brain. Vascular dementia can be managed with the therapeutic interventions recommended for coronary artery disease: healthy diet, smoking cessation; conservative alcohol intake; statins; and possibly anticoagulants to prevent clots.<sup>12</sup>

### Mixed dementia

Usually refers to a combination of AD and vascular dementia.<sup>12</sup>

### Lewy-Body dementia

People with Lewy-Body dementia (LBD), also referred to as

dementia with Lewy-Bodies, often have problems with disturbed sleep and hallucinations. Lewy Bodies (LB) are small deposits of protein in nerve cells and are named after the physician who first described this condition. LBs can also cause Parkinson's Disease and presentation depends on which part of the brain is affected: at the base of the brain they cause motor problems, in the outer layers cognitive symptoms. With time, the symptoms of LBD and PD become more similar.<sup>13,14</sup>

### Fronto-temporal dementia

Fronto-temporal dementia (FTD) generally affects people slightly younger than the other dementias, with symptoms presenting in the sixth decade. As the name suggests, the disease predominantly affects the frontal and temporal lobes of the brain, meaning the predominant early features are personality change, and problems with executive function. People with FTD can exhibit challenging behaviour, as the brain damage can cause them to become dis-inhibited. This may present as short temperedness, aggression, mood swings and sexually inappropriate behaviour. FTD can be linked to motor neurone disease.<sup>13,14</sup>

### Early stages

The dental team may be the first to notice the subtle changes that occur in the early stages, which are not detectable to those who see the person every day. A previously reliable patient may forget appointments and either not come or turn up on the wrong day or at the wrong time. Another early sign is difficulty in making decisions, perhaps about dental treatment. Oral hygiene may deteriorate as patients cannot remember whether they brushed their teeth that day or not. The dental team might notice that the person cannot remember names of family members or forgets the conversation he/she had at the last visit.

We can all have forgetful moments but the memory loss associated with dementia is more serious and is usually for recent events. Other early signs include repetition: asking the same question repeatedly and losing the thread of what is being said. Confusion and difficulty in grasping new ideas can also

Type of Dementia	Causes	Signs and Symptoms	Treatment
Alzheimer's Disease (AD)	Accounts for 60% of dementia diagnosis. It is caused by plaques appearing in the brain	Typically present with short-term memory loss and word-finding difficulties  Progressively become more confused with mood swings and frustration, more withdrawn, loss of confidence and communication  Everyday activities, such as using a phone or TV remote will become more challenging	Anti-cholinergic therapy has been shown to be effective in early to moderate AD. <i>Donepezil (Aricept)</i> is the NICE recommended first drug of choice
Vascular Dementia	Caused by congestion of small blood vessels in the brain	Often diagnosed after a stroke  Deterioration is stepwise with signs and symptoms similar to that of AD	Healthy diet, smoking cessation; conservative alcohol intake; statins; and anticoagulants to prevent clots
Mixed Dementia	A combination of vascular dementia and Alzheimer's Disease	A combination of vascular dementia and Alzheimer's Disease	Approach will include treatments for both vascular and AD
Lewy-Body Dementia	Deposits of protein in nerve cells	Disturbed sleep and hallucinations	Management of symptoms and support
Fronto-temporal Dementia	Damage to frontal and temporal lobes of the brain	Younger presentation Challenging behaviour Disinhibition Short-tempered Aggressive Mood swings Sexually inappropriate	Multidisciplinary support

**Table 1.** Types, signs, symptoms and treatment of dementia.

make communication difficult.

If the dental team notice these changes, it is important to speak to the patient. This will not be an easy conversation as it may confirm thoughts that the patient has had but is trying to ignore. It would be good to involve the family at this stage. They may have noticed behavioural changes with their loved one becoming less interested in others around them and more irritable. It is important to encourage, in a sensitive manner, patients to seek diagnosis, as early treatment can slow down progression of the disease.

#### Middle stages

By this stage alterations in behaviour are more apparent and the

person will need reminding to wash and eat and help to carry out these tasks. The dental team might notice confusion and agitation in someone who was previously happy in the dental setting. He/she might not recognize the dental team and repeatedly ask the same question, forgetting the answers given. It is important to stay calm and allow time for the patient to remember without jumping in and answering for him/her. The family are likely to notice changes and may tell you that their family member has started doing risky things at home, like leaving the cooker on or wandering off at night. Assistance may be required for toileting: it is helpful if toilets are clearly signed in the dental practice and include grab rails and toilet paper with distinct colours.

#### Later stages

Now it will be difficult for the person to come to the dental surgery due to increasing fragility and mobility problems. They progress from difficulty walking, to using a wheelchair or, in the later stages, being confined to bed. The disease can cause difficulty in eating and swallowing so that the dental team may be asked to carry out an examination to rule out a dental cause for these difficulties. Because of this, people can lose weight, making denture-wearing difficult. There is a loss of speech and increasing communication difficulties. At this stage, dental treatment should be focused on making sure that the patient's mouth is comfortable and that carers are carrying out regular oral healthcare.

## Dementia and link with oral disease

There is no clear evidence that dementia and poor oral hygiene are linked, therefore any suggestion that good oral hygiene prevents dementia is ill-founded. Periodontal disease adds to systemic inflammation and is commonly found in the older dentate population. This inflammation can affect the brain, disrupt neurons and cause poor memory. A small research study looked at gingival bacteria markers in brain tissue from ten cadavers from people who died with Alzheimer's Disease and ten without. Markers were found in four people with Alzheimer's but none in any of those without dementia.<sup>15</sup> However, further work is required to establish a definitive link.

## The dental management of patients with dementia

As dementia progresses so do the challenges for dental professionals who provide treatment for these patients. The challenges are multifactorial and special consideration is needed not only in providing treatment, but also helping patients to access services, taking consent, communication and treatment planning for the future. Prevention of disease is fundamental to their dental management.

### Communication

Communication is a two-way process between individuals sending and receiving information, both verbally and non-verbally. As dementia progresses, the ability of the patient to communicate is disrupted and, over time, communication becomes more and more difficult.<sup>16</sup> Simple tasks for clinicians, such as taking a medical or pain history, can become difficult, as well as taking consent. Knowing and understanding the wishes and beliefs of the patient may be hard, especially if he/she is new to your practice or service.

It is important to understand that patients can feel very confused and distressed in the dental setting, but may not be able to express this. Effective communication is important to reduce any anxiety for the patient and the clinician. The dental team may need to make adjustments in how they communicate with dementia patients.<sup>16</sup> Key changes include using simple

language, speaking clearly and slowly, but without making patients feel stupid. Allow time for patients to process the information and time to respond. You may need to rephrase something if patients do not understand in the first instance. Maintain eye contact, smile and constantly reassure patients. Explain everything, sometimes you may need to repeat your explanation. Listen and do not dismiss them, even if what they say is out of context. Always remember to include them in conversations, even if there is no response. Consideration should also be given to other communication aids, such as pictures and signs.<sup>17,18</sup>

Prompts have been shown to aid communication in dementia.<sup>16</sup> Some patients will have a 'This is me' Document created by The Royal College of Nursing with The Alzheimer's Society. It is a tool for people with dementia to complete when they are first diagnosed. It gives information to health and social care professionals about their needs, interests, preferences, likes and dislikes.<sup>19</sup> Clinicians can also use this information as a basis for their communication by using the information as prompts.

Up-to-date medical histories may need to be obtained from General Medical Practitioners. Carers and relatives should be asked about changes in behaviour, including eating and sleeping, which can indicate dental pain.

### Consent

Mental function will decline as dementia progresses and, at some stage, an individual diagnosed with dementia will lose the ability to make decisions. He/she will lose the capacity to be able to consent for dental treatment. One of the biggest challenges for dental practitioners is judging if that individual has the capacity to give consent.<sup>20</sup> Consent guidelines vary from country to country and even within the UK itself, however, the principles are still the same.

In England, the Mental Capacity Act 2005 gives clinicians a clear and structured approach in assessing someone's mental capacity and provides a framework for clinicians. The act states that no-one is able to give consent to the examination or treatment of an adult who lacks the capacity to give consent for him/

herself, unless authorized to do so under a Lasting Power of Attorney or with the authority to make treatment decisions as a Court Appointed Deputy. Therefore, in most cases, parents, relatives or members of the healthcare team cannot consent on behalf of such an adult. Their views should be respected as far as is reasonably possible, as these individuals will know the opinions of the individual far better than the clinician. This is normally done in a best interests meeting and decisions to treat must be based on the patient's best interests and be the least restrictive option.<sup>21</sup>

Judging someone's capacity to consent is a two-stage process and the decision should be made by the clinician proposing the treatment, however, other healthcare professionals can help the dentist make this decision. At some stage, the diagnosis of dementia will cause the patient to have impairment of brain function and this is the first part of the decision process. If the clinician does decide that there is brain impairment, the second stage is to decide if this impairment means that the patient is unable to make a decision in his/her own best interest. This is a time and treatment specific decision. Patients with dementia may have better times of the day where consent can be given and also phases where capacity is reduced but may improve, as the disease fluctuates. Where dental treatment is not urgent, decisions can be delayed to allow for a time when individuals can consent for themselves. Patients may also be able to consent for simple treatments, such as examination and cleaning of their teeth, but may not have the capacity to make more complicated decisions, such as having teeth extracted or general anaesthesia. The two-stage capacity assessment must be documented with written evidence of the decisions made and how.<sup>21</sup>

An advanced decision is an intervention made by a person when he/she had capacity. Advanced decisions can include decisions not to have treatment once mental capacity is lost. Clinicians must always check to see if there is an advanced decision, a lasting power of attorney or a court appointed deputy in place. The clinician must look at the paperwork that supports this information

as decisions or power to consent for dental or medical procedures are not always included.<sup>21</sup> Where individuals do not have relatives or friends involved with their care an Independent Mental Capacity Advocate (IMCA) can be accessed to support any decisions that could be life-changing,<sup>21</sup> for example a dental clearance.

### Access to dental care

Patients with dementia find it harder to access health services.<sup>22</sup> This may be due to a number of reasons, including difficulties in making appointments, being reliant on carers to aid attending appointments and being physically frailer.

Patients or carers may need reminding of appointments and booking the appointments should be flexible around the best times for the patient, for example in the morning is often better. This will often in turn improve co-operation and communication.<sup>23</sup>

Patients can be more comfortable and lucid in their own home environments<sup>24</sup> and screening, examination and simple treatment could be carried out on a domiciliary basis. Guidelines in domiciliary care can be accessed on the British Society of Disability and Oral Health (BSDH) website.<sup>25</sup>

Some patients may be moved from their homes into residential care, supported accommodation or nursing homes. This makes access to dental care more difficult and further complicated by frequent admittance into hospital. Family and care teams may also find it difficult to access dentistry or to take patients to their dental appointments. Shared care between primary and secondary care settings may be required and patients may need to be seen on a domiciliary basis. Mobile dental units can be useful for access to care homes where multiple patients can be treated.<sup>26</sup>

As dementia progresses, patients will become more frail and possibly rely on the use of wheelchairs. Some people may find transferring to the dental chair difficult and need referral to a service with transfer boards, wheelchair tippers or hoists.<sup>26</sup>

### Treatment planning

The progression of dementia is accompanied by a gradual inability to perform self-care, including oral hygiene,

because of self-neglect and a loss of cognitive and motor skills. Co-operation for assistance with oral hygiene may also diminish.<sup>20</sup> Patients with dementia take multiple medications, often resulting in a dry mouth.<sup>27</sup> Collectively, these problems place these patients at high risk of oral disease.

People differ at the rate in which they deteriorate<sup>20</sup> and treatment plans must be designed to suit the severity of disease. However, consideration must also be given to the future and the reducing ability to maintain oral hygiene, including the ability to use interproximal aids. Providing complex crown and bridgework or even implants, which are going to be difficult to maintain in the later stages of dementia, is not in the patients' best interests.<sup>28</sup>

People are now living longer and keeping their teeth for longer and patients diagnosed with dementia are likely to have at least a partial dentition. This means that they are at risk of recession, root caries and tooth surface loss.<sup>29</sup> Ideally, preventive treatment should begin at early diagnosis.<sup>30</sup> Treatment plans should be kept simple: the removal of teeth with a poor prognosis, which are potential sources of pain, should be carried out, along with restoration of the dentition. This is easier when there is capacity to consent and co-operation for treatment.

Prevention advice should include prescription fluoride toothpastes, oral hygiene instruction, including electric toothbrushes and dietary advice. Professional fluoride application should be applied every 6 months.<sup>31</sup> As the disease progresses, individuals may move into care homes: advice should be given to the care teams in the form of oral healthcare plans and can be put in the patient's room for carers to follow.<sup>30</sup>

There is a link between smoking and dementia and also with smoking and periodontal disease. Smoking cessation should be given where required.<sup>32,33</sup>

If implants are present, specific advice should be given and the implant carefully monitored. It may be advisable to put the implant to sleep and create an overdenture.<sup>34</sup>

If patients present with broken down teeth that are symptomless, it might be better not to provide potentially distressing treatment. These teeth will

require frequent monitoring so that, if a tooth does become problematic, it is treated quickly.

Because of possible early extraction of teeth for dementia patients, a high number of them may be wearing dentures. The chance of losing dentures is increased when living in a care home and with hospital admissions. As dementia progresses, replacing lost dentures may not be in the patient's best interest owing to the co-operation required for each stage of the denture. It is often a very difficult conversation to have with family members when deciding not to replace lost dentures or, indeed, not to carry out dental treatment, and should be done with sympathy and empathy but focused on the best interests of the patient. Dentures can be labelled with the patients name so that they can easily be reallocated if found by care teams. Copy dentures can be made at the early stages of dementia so that, if they are lost later on, a replacement is already available without the distress of making a new set for a patient with limited co-operation.

### Co-operation for treatment

As dementia progresses so does the individual's mental function and ability to co-operate. Many individuals with dementia have anxiety and depression, reducing co-operation further.<sup>20</sup> Some patients will just require more time and explanation, using behaviour management techniques such as 'tell, show, do' and systematic desensitization. Use of clinical holding may also help and are the use of physical holds that are light and do not make the patient feel restricted.<sup>35</sup>

In the early stages of dementia, where co-operation is good and patients are anxious, inhalation sedation is a simple technique that may offer anxiolysis. Where co-operation is limited and anxiety high, sedation with intravenous midazolam is beneficial.

The physiological changes and related diseases that can accompany ageing provide simplifications for pharmacodynamics of drugs. Changes in body composition, tissue drug binding and tissue perfusion may affect the distribution, redistribution and elimination of drugs.<sup>36</sup> Clinicians will need to take

into account the patient's age, frailty and co-morbidities and it may be sensible to carry these procedures out in a hospital setting. Titration with midazolam should be modified. One suggestion is to half the dose and double the amount of time between each increment compared to the usual adult schedule.<sup>37</sup> Intra-nasal sedation with midazolam can help by facilitating cannulation for an unco-operative patient; again much lower doses will be needed for the older/frailer patient and the clinician must be well practised in cannulating patients to allow for safety.<sup>38</sup>

Where treatment is extensive or sedation not suitable, general anaesthesia can be used and allows for full co-operation. There is evidence to suggest that dementia can worsen following general anaesthesia.<sup>39</sup> It is thought that short quick procedures are best and thought should be given to co-morbidities and fitness for general anaesthesia.

A light sedation with continuous infusion propofol could also be considered. Propofol has a more anxiolytic than a sedative effect compared to midazolam and has the advantage of having a very fast recovery time. This can be good for short procedures and, because it is given continuously, it can also be used for longer procedures. This may limit the need for general anaesthesia in cases where patients present with high treatment need and are anxious. Propofol does cause respiratory depression and there is no reversal drug. As it is a continuous infusion, the effect on patients becomes more over time. Care is required when administering this drug for conscious sedation and advanced sedation training is necessary to use this technique. It must be administered with an operator and a separate sedationist.<sup>40</sup>

### Training

There is a need for staff training to raise awareness of dementia and to provide better care. The Alzheimer's Society provides training and produces supporting materials which can be used in the practice.<sup>41</sup> A major London training hospital has run an awareness programme on the needs of dementia patients when they are in hospital: Barbara's Story. Although based on a hospital patient, the material contains information which can be applied

in the dental setting. The programme is available from [barbarasstory@gstt.nhs.uk](mailto:barbarasstory@gstt.nhs.uk) or a condensed version can be viewed on YouTube.<sup>42</sup>

### Conclusion

Everyone in the dental team is going to be affected by dementia. We cannot ignore this condition and must make provision to provide appropriate oral healthcare, ensuring that our dental clinics are dementia friendly environments.

We need to plan treatment carefully to reduce the risk of dental pain for this vulnerable group and reduce the need for extensive treatment in the later stages of the disease.

### References

- [http://alzheimers.org.uk/site/scripts/documents\\_info.php?documentID=342](http://alzheimers.org.uk/site/scripts/documents_info.php?documentID=342). Accessed 7th October 2014.
- <http://dementiapartnerships.com/pm-announces-new-measures-to-improve-hospital-dementia-care/> Accessed 7th October 2014.
- World Health Organization. *International Statistical Classification of Diseases and Related Health Problems*. 10th Revision Volume 2 Instruction Manual: 2010 edition.
- [http://www.alzheimers.org.uk/site/scripts/documents\\_info.php?documentID=1816](http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=1816). Accessed 7th October 2014.
- Naorungroj S, Slade GD, Beck JD, Mosley TH, Gottesman RF, Alonso A, Heiss G. Cognitive decline and oral health in middle-aged adults in ARIC Study. *J Dent Res* 2013; **92**: 795–801.
- Helping you to assess cognition*. The Alzheimer's Society, March 2013.
- Rubin DH, Storandt M, Miller JP, Kinsherr D, Grant EA, Morris JC, Berg L. A prospective study of cognitive function and onset of dementia in cognitively healthy elders. *Arch Neurol* 1998; **55**: 395–401.
- <http://www.nice.org.uk/guidance/CG42/chapter/1-Guidance> Accessed 7th October 2014.
- <http://www.alzheimers.org.uk/site/scripts/documents.php?categoryID=200346> Accessed 7th October 2014.
- NHS England. *Commissioning for Quality and Innovation (CQUIN)*: 2014/15 guidance.
- [http://www.alzheimers.org.uk/site/scripts/documents\\_info.php?documentID=1521](http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=1521). Accessed 7th October 2014.
- [http://www.alzheimers.org.uk/site/scripts/documents\\_info.php?documentID=535&pageNumber=2](http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=535&pageNumber=2). Accessed 7th October 2014.
- Scott KR, Barrett AM. Dementia syndromes: evaluation and treatment. *Expert Rev Neurother* 2007; **7**: 407–422.
- [http://www.medicinescomplete.com/mc/bnf/current/PHP3236-drugs-for-dementia.htm?q=dementia&t=search&ss=text&p=1#\\_hit](http://www.medicinescomplete.com/mc/bnf/current/PHP3236-drugs-for-dementia.htm?q=dementia&t=search&ss=text&p=1#_hit). Accessed 7th October 2014.
- Poole SA, Singhrao SK, Kesavalu L, Curtis MA, Crean SJ. Determining the presence of periodontopathic virulence factors in short-term postmortem Alzheimer's Disease brain tissue. *J Alzheimer's Dis* 2013; **36**: 665–677.
- Bush T. Communicating with patients who have Dementia. *Nursing Times* 2003; **99**: 42–45.
- <http://www.nhs.uk/Conditions/dementia-guide/Pages/dementia-and-communication.aspx>. Accessed 7th October 2014.
- Frenkel H. Alzheimer's Disease and oral care. *Dent Update* 2004; **31**: 273–280.
- 'This is me' document. Available from [http://www.alzheimers.org.uk/site/scripts/download\\_info.php?downloadID=399](http://www.alzheimers.org.uk/site/scripts/download_info.php?downloadID=399). Accessed 7th October 2014.
- Ouldred E, Bryant C. Dementia care. Part 1: guidance and the assessment process. *Br J Nurs* 2008; **17**: 138–145.
- Emmett C. The Mental Capacity Act 2005 and its impact on the dental practice. *Br Dent J* 2007; **9**: 515–521.
- Forbes DA, Morgan D, Janzen BL. Rural and urban Canadians with dementia: use of health care services. *Can J Aging* 2006; **25**: 321–330.
- Scully C, Ettinger RL. The influence of systemic diseases on oral health care in older adults. *J Am Dent Assoc* 2007; **138**: 75–145.
- Johnson MH. Assessing confused patients. *J Neurol Neurosurg Psych* 2001; **71**: i7–i12.

25. British Society for Disability and Oral Health. *Guidelines for the Delivery of a Domiciliary Oral Healthcare Service*, Revised 2009.
26. Dougall A, Fiske J. Access to special care dentistry, part 1. Access. *Br Dent J* 2008; **204**: 605–616.
27. Leal SC, Bittar J, Portugal A, Falcão DP, Faber J, Zanotta P. Medication in elderly people: its influence on salivary pattern, signs and symptoms of dry mouth. *Gerodontology* 2010; **27**: 129–133.
28. Bridgeman AM, Mellor AC, Crossley ML, Shearer AC. Treatment planning for the problem patient: restorative, ethical, legal and psychological perspectives. Case 4: Mr Lester. *Dent Update* 2001; **28**: 399–402.
29. Preston AJ, Barber MW. The ageing UK population – considerations for the restorative dentist. *Int Dent J* 2007; **57**: 423–428.
30. Ghezzi EM, Ship JA, Arbor A. Dementia and oral health. *Oral Surg Oral Med Oral Pathol* 2000; **89**: 2–5.
31. Department of Health. *Delivering better oral health: an evidence-based toolkit for prevention*. Public Health England, June 2014.
32. Juan D, Zhou DHD, Li J, Wang JYJ, Gao C, Chen M. A 2-year follow-up study of cigarette smoking and risk of dementia. *Eur J Neurol* 2004; **11**: 277–282.
33. Rivera-Hidalgo F. Smoking and periodontal disease. *Periodontology* 2000 2003; **32**: 50–58.
34. Visser A, de Baat C, Hoeksema AR, Vissink A. Oral implants in dependant elderly persons: blessing or burden? *Gerodontology* 2011; **28**: 76–80.
35. British Society for Disability and Oral Health. *Clinical Holding Guidelines*, 2010.
36. Vuyk J, Oostwouder CJ, Vletter AA, Burm AGL, Bovill JG. Gender differences in the pharmacokinetics of propofol in elderly patients during and after continuous infusion. *Br J Anaesth* 2001; **86**: 183–188.
37. Craig D, Wildsmith JAW. Conscious sedation for dentistry: an update. *Br Dent J* 2007; **203**: 629–631.
38. Manley MCG, Ransford NJ, Lewis DA, Thompson SA, Forbes, M. Retrospective audit of the efficacy and safety of the combined intranasal/intravenous midazolam sedation technique for the dental treatment of adults with learning disability. *Br Dent J* 2008; **205**: E3 online article.
39. Chen PL, Yang CW, Tseng YK, Sun WZ, Wang JL, Wang SJ, Oyang YJ, Fuh YJ. Risk of dementia after anaesthesia and surgery. *Br J Psych* 2014; **204**: 188–193.
40. Independent Expert Group on Training Standards for Sedation in Dentistry. *A Guide to Maintaining Professional Standards in Conscious Sedation for Dentistry*, 2011.
41. <http://www.alzheimers.org.uk/site/scripts/documents.php?categoryID=200293>. Accessed 7th October 2014
42. [http://www.youtube.com/watch?v=DtA2sMAJU\\_Y](http://www.youtube.com/watch?v=DtA2sMAJU_Y). Accessed 7th October 2014.

## Part-time MSc Dentistry Courses

Quality assured Dental education and training for the ambitious practitioner

Most dentists have professional and personal commitments that make full-time study impossible but many still want the structure and quality assurance that a university can provide. At UCLan we have a range of part-time clinical MSc degree programmes designed with the busy but ambitious dental practitioner in mind. Our Programme Directors are:

- **Dr Mike Jones**  
Endodontics
- **Dr Fadi Barrak**  
Implant Dentistry
- **Dr Elizabeth Browne**  
Non-Surgical Facial Aesthetics
- **Professor StJohn Crean**  
Oral Surgery
- **Dr Nic Hodson**  
Periodontology
- **Dr Malcolm Edwards**  
Prosthodontics

Our programmes will deliver the skills and knowledge that will enable participating practitioners to fit easily into a managed clinical network by being able to offer additional clinical services. Such skills not only suit the new model for the delivery of NHS dental care but clearly have value where patients choose to receive treatment under private contract.

Come along to our advice day on 9 June 2015, 2.30 – 6.30pm, register now at: [pgdentistry.eventbrite.co.uk](http://pgdentistry.eventbrite.co.uk)

Call 01772 895861

Email [medent@uclan.ac.uk](mailto:medent@uclan.ac.uk)

Visit [www.uclan.ac.uk/med-dent](http://www.uclan.ac.uk/med-dent)

Setting standards in Primary Care Education

