Dental problems and their management in patients with dementia
This evidence summary aims to locate and summarise evidence on the dental problems seen in patients with dementia and how they can be managed. It does not include detailed descriptions of the studies cited nor does it include information that was not presented in the literature.

The Curious about website encourages dental professionals to raise issues where a review of the available evidence would provide a useful resource for other dental professionals. Where there is a lack of evidence, the topic is considered for research and an award is made available.

These activities are sponsored by the Shirley Glasstone Hughes Fund, a restricted fund within the BDA Trust Fund. The focus of the fund is research into primary care dentistry and aims to generate a body of relevant research for practising dentists.
Key findings

• Dental problems in patients with dementia are similar to those encountered by those without dementia.
• Data limitations prevent any conclusions being reached with regards to the extent of these problems or to the difference in severity between those with dementia and those without.
• There are no published studies examining the management of dental problems in dementia patients therefore no conclusions could be reached on this question.

Review question

This evidence summary was prepared in response to the following question: What dental problems are seen in patients with dementia and how can they be managed?

Key terms

Dementia:
A syndrome associated with an ongoing decline of the brain and its abilities. (1)

Dental problems:
Include items such as caries, periodontal disease and oral lesions

The case for action

What is dementia
Dementia, one of the main causes of disability later in life, (2) is a progressive, neurodegenerative disease that affects the ability to perform daily living activities. (3) It results in a decline in multiple areas of function, including memory, reasoning and communication skills and may also include behavioural and psychological symptoms such as depression, psychosis and aggression. (4) The main sub-types of the condition are: Alzheimer’s disease (AD), vascular dementia, mixtures of these two pathologies (‘mixed dementia’) and rarer types such as Lewy body dementia, frontotemporal dementia and dementia in Parkinson’s disease. (4) The etiology of dementia is not understood but the result is structural, e.g. plaque and tangle formation, and chemical changes in the brain and death of brain tissue. (4) Though age is the main risk factor for dementia it can affect younger people (5) with at least 15,000 people under the age of 65 having the illness in the UK. (6) While dementia is terminal, those affected can live with the condition for 7–12 years post diagnosis. (6) There are no proven treatments that can prevent the development of dementia, and no cures, but drugs can, in some patients, improve or temporarily slow symptom progression. (5,6)

In 2009 there were 700,000 people in the UK with dementia and the annual cost to the economy was £17 billion. By 2039 the number affected will double to 1.4 million with annual costs rising to over £50 billion. (7) The devastating impact dementia has on sufferers and the challenges it poses to society have been recognised and the Department of Health have developed a national dementia strategy with the aim of ensuring that significant improvements are made to dementia services across a number of areas, including quality of care. (8)

Oral health in those with dementia
Maintaining oral health in people with dementia is important for a variety of reasons: (6–8)

• Quality of life: To allow people to continue to talk comfortably and confidently, enjoy eating, maintain confidence in their appearance and be pain free.
• Medical reasons: To manage the side effects of medications taken for dementia and its symptoms, maintain adequate nutrition and minimise sources of micro-organisms that may later involve other parts of the body such as aspiration into the lungs (aspiration pneumonia is a common cause of death in patients with AD).
• Dental reasons: To prevent the development of dental problems, complications and emergencies or the need for general anaesthesia and to minimise the risk of unnecessary tooth extractions.
• Behavioural problems: Behavioural problems that are caused by dental pain can be minimised with good oral health. Such problems include a disinterest in or avoidance of food, pulling at the mouth or face, chewing of the lip or tongue, excessive grinding of teeth or dentures, aggression or withdrawal.

People with dementia are likely to have a unique set of factors that compromise oral health and increase the risk of dental disease and as the condition progresses, the susceptibility to dental disease increases. To manage their condition, they may be taking multiple medications that can cause xerostomia, vomiting, gingival overgrowth or tardive dyskinesia. (6–9,11) Furthermore medications prescribed for dementia and its symptoms have the potential to cause adverse reactions when combined with drugs used in the dental clinic or prescribed by the dentist including some anaesthetic and anti-microbial agents. (11)
As dementia progresses and patients’ apathy, apraxia and cognitive impairment grows, oral care can be forgotten. There can be a disinterest by the individual affected by dementia in dental maintenance and a reduction in the physical ability of the individual to maintain their oral health and communicate dental problems.\(^{6,12}\) Additionally as the behaviour of the patient becomes resistant or combative, providing care becomes more difficult and care-givers can eventually stop taking the individual to the dentist\(^{13-15}\).

If the patient is taken to the dentist their neurological deterioration can cause agitation, disorientation and inappropriate behaviour and they may be less able to tolerate dental procedures.\(^{8}\)

This summary aims to summarise the available evidence relating to the dental problems seen in dementia patients and how these can be managed.

The evidence

Dental problems in patients with dementia have been examined and studies demonstrate that the types of problems encountered by this population are similar to those encountered by those without dementia. With regards to the extent of these problems, or to the difference in severity between those with dementia and those without, no conclusion could be reached due to limitations encountered with the available data. Due to the difficulty in carrying out longitudinal studies on those with dementia there is very little published research supporting the views of dental professionals that oral health is often affected in those with AD and other dementias.\(^{3}\)

Some of the specific difficulties and limitations encountered by the studies included in this summary are mentioned at a later stage. There are no published studies examining the management of dental problems in dementia patients therefore no conclusions could be reached on this question. With the predicted increase in dementia sufferers, there may be a need for well-designed and well-conducted studies to evaluate treatment for dental problems in those with dementia.

The findings of this summary are presented below as an overall narrative summary with data being grouped by the type of dental problem.

Dental problems in dementia

General oral health and oral hygiene

It is suggested that patients with dementia are more likely to have poor oral hygiene than those without\(^{19,37}\) and that dementia severity may influence oral health.\(^{7,35}\) However this suggestion is not universal with some data implying the opposite.\(^{29,14,36}\)

Tooth loss

Patients with dementia can lose teeth though it is not clear if the risk, rate of tooth loss or prevalence varies for those with dementia compared to those without. There is conflicting data in this area with some data indicating no significant difference between those with dementia and those without\(^{7,28,38}\) and others indicating that those with dementia have a lower number of teeth.\(^{20}\)

Caries/decay

Root and coronal caries as well as decayed retained tooth roots have been examined in dementia patients. The majority of studies demonstrate that those with dementia have a significantly greater caries and/or decay experience than those without\(^{7,17,23,24,26,27,30,35,37}\).

Other notable factors are:

- Caries prevalence is related to dementia type and severity.\(^{21}\)
- Those with a dementia diagnosis other than AD are at a particularly high risk of developing multiple carious lesions during their first post diagnosis year.\(^{23}\)
- Dementia sufferers have an increased likelihood of having restored teeth.\(^{28}\)
- Dementia suffers have more nonfunctional/unrestorable teeth than those without dementia.\(^{15}\)
- Newly diagnosed dementia sufferers already have a high level of active dental caries.\(^{21}\)

Conversely some studies saw no significant difference in some caries/decay measures, e.g. caries experience, between those with dementia and those without.\(^{20,21,25,27,32,36}\) AD patients were found to have the smallest difference in mean number of decayed surfaces in comparison to those with other types of dementia and those without dementia though this may be due to
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Periodontal/gingival status
People with dementia can suffer from periodontal and gingival problems and there are suggestions that the extent of these problems are related to the level of dementia severity. However like many aspects covered in this summary the data does not provide a unanimous consensus on the extent of the problems. People with dementia (in some cases AD specifically) can have:

• Significantly poorer gingival health than those without the condition
• Significantly heavier gingival bleeding
• Significantly heavier inflammation (in disabled dementia patients)

Other
Swallowing was found to be significantly worse in dementia sufferers and evidence suggests that those with AD have reduced saliva flow while people with forms of dementia other than AD have significantly more xerostomia than those without dementia or those with AD.

Figure 1: Treatment suggestions for dementia patients

1. Early/mild disease
   1. Most dental treatment can be carried out
   2. Employ aggressive prevention and recall
   3. Treat sites of infection and possible sources of acute/chronic pain or pathology
   4. Fixed prosthetics preferred to removable due to danger to patient
   5. Identify key teeth and restore to function
   6. Restorative treatment should be high quality and low maintenance
   7. Advanced restorative treatment should only be planned knowing a care-giver is prepared to maintain when necessary

2. Moderate disease
   1. Focus changes from restorative and rehabilitative to maintenance and prevention
   2. Aggressive recall and rigorous prevention continued
   3. Short appointments indicated
   4. Sedation or general anaesthesia may be necessary for treatment

3. Severe/advanced/late disease
   1. Treatment focuses on prevention, maintaining oral comfort and emergency care
   2. Complex or time consuming treatment avoided
   3. Sedation and short appointments
   4. Interventions should be as non-invasive as possible

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Managing dental problems in dementia
While no studies were found covering the management of dental problems in patients with dementia, there are a number of publications on treatment planning for dementia patients. Although these publications are considered to have little value in terms of the level of evidence they carry and are not strictly related to the question posed, they may provide some steer as to how to best manage the oral health needs of those with dementia. Summarised below is some of the advice on treatment planning provided by a selection of these publications.

Dental treatment for a patient with dementia is based on the dentist’s clinical judgement together with the input of the patient (if possible) and their family or carers. Areas that should be considered are:(3;10)

- The patient’s level of independence, co-operation, cognitive state and physical impairment
- The presence of dental problems and whether they are symptomatic or asymptomatic
- The individual’s ability to give informed consent

Once this information has been collated, a treatment plan can be generated with the goals being to prevent further oral disease, restore and maintain health and make oral health care a normal part of the patient’s life. (110) The plan should be flexible, anticipating a decline in patient health over time(11;40) and be realistic given the patient’s disorder and physical status. (11;40) Given the nature of dementia, caregivers’ perceptions and knowledge about oral health and hygiene must be considered as they represent the primary providers to the patients as the condition progresses. (40) As dementia progresses, and the patient’s health declines, different approaches will be required (Figure 1).

Methods
Search strategy
Two searches of Ovid MEDLINE were carried out. One search was to retrieve publications covering dental problems in dementia patients and employed Ovid filters for systematic reviews, meta-analysis and clinical trials and the second search located publications covering the management of dental problems in dementia patients. Search terms used included: Comprehensive Dental Care, Mouth Rehabilitation, Dental Health Services, Stomatognathic Diseases, dementia and alzheimer disease. Both free text and key terms were employed. No limits were placed on publication language or date. Searches are current as of August 2013.

The following databases were also searched using similar strategies:
- Cochrane library (DARE, NHS EED, HTA Database, Cochrane reviews)
- Pubmed MEDLINE
- Science Direct

Grey literature was searched and a snowballing strategy was employed once publications covering the questions were located. Papers were included if they examined oral health/dental problems in dementia patients when:
- Dementia had been formally diagnosed previously or in the current study
- The study investigated ways in which dental problems in dementia patients could be managed.

Publications were excluded if patients were grouped together in a manner that prevented data covering dementia patients from being extracted, if it was not clear that the study population suffered from dementia e.g. if cognitive impairment using a test such as the MMSE was used to assess people who had not formally been diagnosed with dementia.

Results
Over 200 publications were returned though searches and following sifting by the author the full text of 77 were examined. 28 were judged as relevant. The majority examined Alzheimer’s disease though some studies examined dementia in general. One possibly relevant publication(166) was not included as the author was not able to obtain the full text.

Twenty-eight publications, covering 24 studies, investigating dental problems in patients with dementia were located; none were systematic reviews or meta-analysis. Some studies collected baseline data(17-22) while others were longitudinal with follow-up periods varying from two to seven years. (21;29) The participants of the studies varied in their habitat with some residing in the community(21;23;30) and others in institutions. (19;24;25;27;31-33) Data collection methods varied and included surveys, (21;30) retrospective examination of medical/dental records and oral examination. (11;17;21;28-29) Studies were carried out in Australia, (7;13;22;25-27;31) the USA, (17;21;28-29) the UK, (18;23) other parts of Europe, (21;23;30-35;38) and Brazil. (20;34) All the located studies had limitations such as population/sample bias(13;25;35;38) including focusing on patients that were likely to be more health conscious and therefore have better than average oral health or those at the lower end of the dementia spectrum. Further limitations, as recognised by the authors of the publications, included low response rate and the death of participants. (13) the lack of ability to collect medical data(35) and the reliance on medical records. (30) Dental examiners performing
the studies were not always calibrated\(^{30}\) and providing oral examination away from the clinic caused some problems.\(^{38}\) Searches were conducted in August 2013.

\section*{References}


