

British Society of Gerodontology





# Guidelines for the Oral Healthcare of Stroke Survivors





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- 50% in studies<sup>[8]</sup>. It is  
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## Guidelines for the Oral Healthcare of Stroke Survivors

### Introduction

The impact of stroke on individuals and their families cannot be underestimated as it is the largest cause of disability in adults. 900,000 people in England have survived a stroke and 300,000 are living with moderate to severe disability as a result. Early recognition of stroke is vital to reduce the degree of brain damage it causes. Identifying people at risk of stroke and implementing appropriate prevention will also reduce the incidence. The dental team has a role to play in the prevention of stroke and the rehabilitation of survivors. Prevention may include advice about diet, alcohol consumption and smoking cessation; it may include a simple reminder to patients to have their blood pressure measured; it may even involve recognising a history of transient ischemic attack (TIA) and directing patients towards appropriate medical services.

Stroke survival is linked to rapid implementation of high quality specialist services. The dental team forms part of a multidisciplinary approach to care. This will involve advising and assisting acute care services in maintaining proper oral healthcare during the early stages following stroke. In the subsequent period of rehabilitation it may include the provision of preventative and restorative care. There is a perception that dentistry is left out of the equation of stroke care provision. The National Stroke Strategy (2007) does not mention dentistry specifically although it does emphasise the importance of establishing a network of care. The onus is therefore on the 'stroke skilled dental team' to identify itself as a specialist service provider and form part of this network of care. Bearing in mind the problems that stroke survivors may have in gaining access to and accepting dental care the skills of Special Care Dentistry will be of particular importance. So it is timely that Special Care Dentistry is now recognised as a speciality in its own right.



As most strokes occur in older people, their oral health care is of concern to the sub-specialty of Gerodontology and meet the aims of the British Society of Gerodontology (BSG) which are to protect, maintain and improve the oral health of older people by providing a forum for further knowledge and increased awareness relating to oral health, dental needs and treatment of older people (BSG, Registered Charity 1118671).

Although this guideline is aimed primarily at the dental team it is hoped that it will provide all health professionals with comprehensive guidance on oral health care for people with a stroke.

The purpose of the guideline is to

- Emphasise the importance of oral healthcare in the rehabilitation of stroke survivors
- Assist the dental team in planning the oral healthcare of stroke survivors
- Provide guidance for the commissioning of appropriate dental services for stroke survivors

In July 2007 a small working party was convened by the British Society of Gerodontology consisting of Tim Friel, Janet Griffiths, Vicky Jones and Mark Taylor. We were later joined by Ilona Johnson who has also contributed material to this document. The working party acknowledge the assistance of other parties who have contributed advice and material for this document. In particular we acknowledge Alison Dougall and Janice Fiske for allowing us to modify an article they published on communication; the British Society of Disability and Oral Health for allowing the use of guidelines; and committee members of the British Society of Gerodontology for their assistance and advice.

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## 1. What Is Stroke?

Stroke, or cerebrovascular accident (CVA), is defined by the World Health Organisation as: ***a clinical syndrome of rapid onset of focal (or global, as in Coma and subarachnoid haemorrhage) cerebral deficit lasting more than 24 hours or leading to death with no apparent cause other than a vascular one.***<sup>[1]</sup>

By defining the period beyond which the neurological signs must continue this definition excludes transient ischaemic attack (TIA). TIA is a ***clinical syndrome characterised by an acute loss of focal cerebral or monocular function with symptoms lasting less than 24 hours and which is thought to be due to inadequate cerebral or ocular blood supply as a result of low blood flow, arterial thrombosis or embolism associated with disease of the arteries, heart or blood.***<sup>[2]</sup>

A 24 hour cut off point is somewhat arbitrary and in fact the majority of TIAs last less than one hour. Therefore, some clinicians also describe a reversible ischaemic neurological deficit (RIND) which lasts for more than 24 hours but where signs and symptoms resolve within three weeks.

### 1.1 Clinical features

When someone has a stroke the initial presentation usually includes the loss of a combination of sensory and motor functions or, less commonly, a sudden loss of consciousness. The presentation may vary according to the region of the brain affected but may include one or more of the following:

- Weakness or clumsiness on one side of the body (Hemiparesis)
- Simultaneous bilateral weakness (Paraparesis)

- Difficulty in swallowing (Dysphagia)
- Imbalance (Ataxia)
- Difficulty in understanding or expressing language (Aphasia)
- Slurred speech (Dysarthria)
- Loss of vision in one (transient monocular blindness) or both eyes
- Double vision (diplopia)
- Loss of consciousness

Lesions in the dominant hemisphere of the brain tend to result in speech and vision deficit while non-dominant hemisphere lesions are associated with self neglect.

A TIA is diagnosed by clinical features and not specific diagnostic tests. These features are similar to those that present in stroke but it is important to rule out symptoms which are not commonly caused by ischemia. Examples of the latter include vertigo, amnesia, deafness, dysarthria, faintness, non specific dizziness, confusion, mental deterioration, incontinence and loss of consciousness. TIA's tend to recur and often precede another form of embolic stroke.

Early detection of stroke is important so the acronym FAST has been proposed by the Stroke Association as an easily remembered way of assessment:

**F**acial weakness - can the person smile? Has their mouth or eye drooped?

**A**rm weakness - can the person raise both arms?

**S**peech problems - can the person speak clearly and understand what you say

**T**ime to call **999**

## 1.2 Mechanisms

There are three forms of completed stroke caused by loss of blood flow to the brain:

- Ischaemic stroke – IS (approximately 80% of all occurrences)
- Primary intracerebral haemorrhage – PICH (approximately 15%)
- Sub arachnoid haemorrhage – SAH (approximately 5%)

**Ischaemic stroke** is caused by atherosclerosis in the cerebral artery system which leads to stagnation of blood flow, local thrombosis and eventual occlusion (thrombotic stroke). As blood flow is reduced in the carotid arteries infarction may occur at the furthest reaches of the arterial system. Alternatively a thrombus may become detached in whole or part and form an embolus which obstructs a smaller distal artery (embolic stroke). Emboli most commonly arise from the bifurcation of the common carotid artery and the heart.

**Haemorrhagic strokes** are caused by rupture of a cerebral artery. The main cause of this is hypertension. It has been shown that older people with raised systolic blood pressure are at significantly greater risk of stroke so there is an important rationale for treating this condition. A number of studies also show a relationship between systolic hypertension, stroke and multi infarct dementia.<sup>[3]</sup>

**Sub arachnoid haemorrhage** is most commonly caused by the rupture of an aneurysm at the base of the brain (85% of cases). Cerebral aneurysms develop throughout life. They may be associated with some connective tissue disorders, hypertension, local anatomical defects and angiogenesis defects but often the cause is unknown.



## Other forms of stroke:

**Stroke in evolution** describes a variation in degree of symptoms in the 24 hours following onset.

**Minor stroke** describes a situation where stroke symptoms resolve completely, usually within a week. Reversible ischaemic neurological deficit is a variant of this where the recovery time can be as much as 3 weeks

### ***1.3 Epidemiology***

The impact of stroke on society cannot be underestimated; it is the 2nd commonest cause of death worldwide (3<sup>rd</sup> commonest in developed countries) whilst morbidity due to stroke accounts for more than 3% of all disabilities.

- In 1999 approximately 56000 people in England and Wales died of a stroke<sup>[4]</sup> representing 11% of all deaths.
- 20 – 30 per cent of people who have a stroke die within a month
- Three-quarters of all strokes occur in people who are 65 years of age or older. They are rare below the age of 40.
- As diagnosis of hypertension and appropriate therapy improves, the incidence of stroke between the ages of 40 and 60 is now decreasing.
- In 2005 it was estimated that there were over 900,000 people in England who have had a stroke of which a third have been left with moderate to severe disability<sup>[5]</sup>. The overall cost to society at the time was thought to be £7bn per year which included £1.8bn of lost earnings and increased benefit payments and costs for carers of £4bn.
- It is the single largest cause of adult disability.

### **1.4 Risk Factors**

There are a number of known risk factors for stroke which are outlined in Table 1. It is important for the dental professional to be aware of these because of the role that he or she has to play in the prevention of stroke. Furthermore, stroke survivors often present with a complex medical history which is likely to affect treatment planning.

There is a higher incidence of stroke in economically disadvantaged groups and amongst certain ethnic groups.

People of African or Caribbean ethnicity are twice as likely to have a stroke compared with their white peers.

Although stroke is more common in men they are more likely to survive than women.

Table 1: Risk factors for stroke

Family history
Country of origin
Smoking
Hypertension
Obesity
Sedentary lifestyle
High cholesterol
Polycythaemias
Antiphospholipid syndrome

## **2 The Oral Impact Of Stroke**

A stroke can have a profound effect on the oral and facial tissues resulting in difficulties in the most basic daily tasks such as eating, drinking swallowing and communication. The impact of stroke on the oral structures varies from person to person. Some individuals have very little or no problems after a stroke whereas others have severe difficulties as a result of the duration of the stroke and its direct and indirect effects. A stroke can affect basic oral functions and can contribute to oral infection and decay. It can have a major impact on nutrition<sup>[6]</sup>, quality of life and subsequently general health and recovery<sup>[7]</sup>.

### ***2.1 Facial Palsy***

Motor nerve supply to the face is provided by the seventh cranial (facial) nerve. Damage to this nerve following stroke may occur in the brain (upper motor neurone damage) resulting in loss of voluntary muscle movement. The face may sag on the affected side with associated problems of speech, swallowing and chewing. Motor response to emotion such as smiling may be retained however, and taste and crying are usually normal.

### ***2.2 Dysphagia (Impaired Swallowing)***

Dysphagia is the interruption of the passage of a food and liquids through the mouth, pharynx and oesophagus. It is a common finding in stroke survivors with an incidence ranging from 23% - 50% in studies<sup>[8]</sup>. It is thought that the large variation observed occurs because of different study designs and criteria used to diagnose the condition. The major problem with dysphagia is the potential for aspiration and the associated risk of developing pneumonia<sup>[9]</sup>. Loss of sensation in the mouth also affects the swallow reflex<sup>[10]</sup> and contributes to a reduction in the protection of the airway. Poor lip seal can be

a problem too, so that it can be difficult for the individual in keeping food and fluids within the mouth.

Normal swallowing occurs in a number of stages. Food is introduced into the mouth and broken down to an appropriate size. The tongue sweeps into the buccal and labial sulci to collect broken down food and gather it up to the back of the mouth where it is propelled rapidly into the pharynx. When the food enters the pharynx, breathing is stopped; the soft palate rises to seal the nasopharynx; the glottis (opening of the larynx) closes and the larynx is pulled up while the epiglottis tilts back to cover it. When the bolus enters the oesophagus the above actions are reversed and food is propelled into the stomach by a combination of peristalsis and gravity<sup>[11, 12]</sup>.

Impairment following a stroke usually affects one or more of the first three stages of swallowing (oropharyngeal dysphagia) as they are more reliant on the action of skeletal muscle. This can result in regurgitation of the bolus into the nose or aspiration into the airway. Movement of the tongue towards the affected side following a stroke and loss of oro facial muscle control can result in food pooling in the sulci of the mouth<sup>[13]</sup>. This together with a decrease in speed and efficiency of clearance increases the risk of decay in dentate individuals and contributes to inhalation of food. Reduced tongue pressure<sup>[14]</sup> and altered lateral movements during chewing, increase the time taken to chew food<sup>[15]</sup>. Loss of sensation in the mouth can also affect the swallow reflex<sup>[10]</sup> and contribute to a reduction in the protection of the airway.

### Diagnosis of Dysphagia

Dysphagia is diagnosed by clinical examination and by the use of special tests. Clinical examination may involve obtaining a history of swallowing problems and observing the individual perform a swallow on foods and drinks of varying consistency. Special tests included video fluoroscopy (VFS) and nasendoscopy. These tests are more accurate at diagnosing dysphagia and

identifying aspiration of food and drink. Following an initial assessment of swallowing, referral to a Speech and Language Therapist (S&LT) is made as part of the Stroke Care Pathway.

### Management of Dysphagia

Most stroke survivors who develop dysphagia recover a safe swallow within one month of onset<sup>[16]</sup>. The control of swallowing appears to come from both sides of the brain and it is thought that spontaneous improvement results from compensation by the non affected side<sup>[16]</sup>. Stroke survivors who develop aspiration pneumonia, which may be related to dysphagia, are at three times the risk from death<sup>[17]</sup> than those who don't. The mouth and pharynx act as a reservoir for bacteria which cause lung infection so the importance of maintaining good oral hygiene for people with dysphagia cannot be overstated. Poor oral hygiene and periodontal disease have also been shown to be associated with an increase risk of pneumonia<sup>[18]</sup>.

Management of dysphagia consists of compensatory and rehabilitative strategies. Appendix 1 summarises advice on the management of patients with dysphagia.

### Compensatory strategies.

These provide short term solutions to the problems caused by dysphagia but do not contribute to recovery of normal swallowing. Such strategies may include altering the consistency of food and fluid with thickening agents to aid swallowing. Thickening agents contribute to reduced oral clearance. They do not usually contain sugar themselves but may be added to sugar containing foods and potentially increase the caries risk for dentate individuals.

Alternatively, feeding by non oral means via a naso gastric (NG) tube or Percutaneous Endoscopic Gastrostomy (PEG) may be necessary. Other

strategies include encouraging the individual to tuck the chin into the chest when swallowing thereby allowing the epiglottis to cover the larynx ; and the

'Mendelsohn Manoeuvre' which involves encouraging the individual to maintain a raised laryngeal position while swallowing.

### Rehabilitative Strategies

These aim to provide a long term improvement in dysphagia and may include exercises designed to improve the strength of the suprahyoid muscles. Such exercises are usually carried out in conjunction with a speech and language therapist e.g. repeated raising and maintaining the head while lying flat<sup>[19]</sup>.

A more recent development is pharyngeal electrical stimulation PES to improve muscle activity which has shown some encouraging results but requires further study<sup>[20]</sup>.

There may be reluctance on behalf of nursing staff to clean the teeth of people with dysphagia because of the potential for aspiration. It is important to stress the necessity for maintaining oral hygiene. Tooth brushing for patients with dysphagia should be carried out while the patient is upright and using suction or alternatively an aspirating tooth brush. Low foaming toothpastes may also be helpful in reducing the risk of aspiration. Toothpaste should be rubbed into the bristles of the toothbrush and excess water removed before placing it in the mouth.

#### Key Points:

- Dysphagia may lead to aspiration pneumonia
- Poor oral clearance leads to higher caries risk
- The dental team should work in conjunction with S&LT and nursing care staff to provide appropriate oral healthcare for people with dysphagia

## 2.3 Communication

*Adapted from: Access to Special Care Dentistry - Part 2: Communication. British Dental Journal (2008) and reproduced with kind permission of the authors*

There are a number of cognitive and communication disorders associated with strokes including aphasia, dysphasia, dysarthria.<sup>[21]</sup> In the early stages following a stroke survivors may exhibit agnosia which results in confusion and an inability to recognize the function of everyday objects such as a toothbrush or denture.<sup>[22, 23]</sup> These disorders limit the individual's ability to communicate and to express their wishes. Communication becomes more time consuming and it can be frustrating for the individual who knows what they want to say but is unable to express themselves, sometimes leading to emotional outbursts. Various aids can be used to facilitate communication and engaging the assistance of a carer who understands the individual well is prudent.

Neurological disease can affect communication in different ways depending on the function of the area of the brain affected by the deficit<sup>[24]</sup>. Additionally, impairment of the right hemisphere or frontal lobe may result in very poor or even absent nonverbal skills leading to poor facial expression and lack of intonation. Almost any acquired brain injury, however slight, may cause memory problems, contributing to language, spatial-perceptual and attention span difficulties. For most stroke survivors, remembering old information (from before the stroke) remains easy, while new learning is difficult.<sup>[25]</sup> Commonly occurring neurological communication impairments include aphasia and dysarthria.

### Aphasia

Aphasia is an acquired communication impairment resulting from damage to portions of the brain responsible for speech. It is a disorder that impairs a person's ability to process language and has a huge negative social, physical and emotional impact on the individual<sup>[26]</sup>. In spite of the fact that it is a

common and severely disabling condition, several international surveys reveal that there is low awareness of it.<sup>[27, 28]</sup>

Aphasia usually occurs suddenly following a stroke. Stroke is the most common cause where 23-40% of survivors acquire long-term aphasia<sup>[29, 30]</sup>. The condition does not affect intelligence but it can affect reading, writing, comprehension and expression to varying degrees. Some people with aphasia have problems primarily with how they speak, while others have their major problems with how they understand. The nature of the problem varies from person to person and depends on many factors, but most importantly on the degree and location of the damage to the brain. Usually reading and writing are more impaired than oral communication.<sup>[21]</sup>

Aphasia affects each person differently and their communication difficulties can also change from day to day or even hour to hour. They are likely to be worse when tired or under pressure<sup>[31]</sup>, and guidance from several aphasia associations recommend a number of strategies for communicating more effectively with people with aphasia.<sup>[29, 31, 32]</sup> Appendix 2 outlines recommendations for communicating with individuals with aphasia. It is important to recognise and understand the type of aphasia a person has, how it affects their communication and to adapt techniques accordingly. Dental professionals should not hesitate to ask the assistance of a Speech and Language Therapist (S&LT) in this respect.

The commonly recognised types of aphasia are outlined in Table 2:



<b>Table 2: Key Features of Aphasia</b>	
<b>Type</b>	<b>Features</b>
Global Aphasia	<ul style="list-style-type: none"> <li>• Most severe form of Aphasia</li> <li>• Individual produces very few recognisable words</li> <li>• Individual is unable to read or write</li> </ul>
Broca's (Expressive) Aphasia	<ul style="list-style-type: none"> <li>• Caused by damage to frontal lobe of the brain</li> <li>• Mild difficulty understanding speech</li> <li>• Limited speech output</li> <li>• Speech may be open to interpretation</li> <li>• Small words may be omitted e.g. person may say "Walk Dog" which could mean "I will walk the dog" or "You take the dog for a walk" depending on circumstances.<sup>[32]</sup></li> </ul>
Wernicke's (Receptive) Aphasia	<ul style="list-style-type: none"> <li>• Caused by damage to the temporal lobe of the brain</li> <li>• Comprehension of speech is impaired</li> <li>• Speech may be fluent but have no meaning</li> <li>• Individual may invent new words and be unaware of mistakes</li> </ul>
Anomic (Amnesic) Aphasia	<ul style="list-style-type: none"> <li>• Comprehension of speech is good</li> <li>• Inability to provide words for things that the individual wants to talk about</li> <li>• May be subtle and manifest in unfamiliar surroundings or stressful situations</li> <li>• Language may include words that the individual may be unlikely to come across in everyday life.<sup>[21]</sup></li> </ul>

## Dysarthria

Dysarthria is a collective name for a group of speech disorders resulting from neurogenic disturbances in muscular control and resultant paralysis, weakness or uncoordination of the speech musculature<sup>[33]</sup>. The intelligibility of the dysarthria depends greatly on the extent of the neurological damage. It can cause problems in both articulation and resonance for patients with a variety of different neurological conditions. All types of dysarthria affect the articulation of consonants, causing slurring of speech. This can be especially debilitating at a time when communication with friends, family and healthcare workers is vital<sup>[34]</sup>. An immediate (and unfortunately common) reaction to this can be an assumption that the patient is drunk – even health professionals get this wrong. It is important that all members of the dental team are aware of this when caring for a person with dysarthria.

## Tips for the Listener

Communicating with a person with dysarthria can be facilitated by following these guidelines:

- Highlight what the person can do to communicate and what aspects of their communication skills are likely to have been retained (e.g. nonverbal skills). This helps in choosing which channels of communication to use
- Ensure the person only does one thing at a time, as performing two tasks simultaneously (eg walking and talking) is difficult for people with neurological impairment
- Reduce distractions and background noise
- Give the person time to reply
- Watch the person as he or she talks and avoid writing notes simultaneously
- Let the speaker know when you have difficulty understanding him or her and do not pretend to understand

- Repeat the part of the message that you understood so that the speaker does not have to repeat the entire message, only the bit you did not catch
- If you still don't understand the message ask yes/no questions, if possible; have the speaker write his/her message to you; or consider an alternative communication method

### **Alternative or augmentive communication (AAC)**

When communication needs cannot be met through speech, non-verbal communication can help to reduce the frustration and stress of being unable to communicate. By alleviating the pressure to speak, alternative and augmentive communication (AAC) allow the person with speech difficulties to be more relaxed, and come across in a more intelligible manner.

AAC aids include:

- **Low technology devices** – such as notebooks and pencil, charts with pictures, symbols, letters or words
- **Wireless or wired Amplification** – which can be used to increase vocal loudness and decrease voice fatigue
- **Email** - using trackballs and mice designed for ease of operator use if there is associated spasticity of the limbs
- **Specially adapted computers** – which may be programmed with voice recognition software or voice synthesizers
- **Electronic voice output devices** – for example light writers which are small portable text-to-speech communication aids, specially designed to meet the particular needs of people with speech loss and progressive neurological conditions.
- **Palatal Lift Devices**<sup>[34]</sup> – a combination palatal lift and augmentation dental prosthesis with modified base-plate to improve articulation, by lowering the palate to aid pronunciation of consonants and by displacing the soft palate, to eliminate the hyper-nasality and emission of air during the production of oral consonant sounds.



Key Points:

- The dental team should be familiar with the problems associated with impaired communication
- A range of devices exist to assist people with impaired communication
- The dental team should consult a Speech and Language Therapist if advice is needed for managing people with impaired communication

### **3. Care Pathways and Teams**

The dental professional needs to be aware of and understand the various care pathways for a person who has had a stroke together with some aspects of the medical management. Although dental treatment may not be appropriate in the early stages of acute stroke management it is nevertheless important that oral preventive measures are instituted. Knowledge of local care pathways and stroke skilled teams will allow the dental team to be ideally placed to assist with the promotion of good oral health and provide treatment if necessary.

#### ***3.1 Stroke Skilled Teams***

A third of all people with stroke will have continuing problems and disability. Those individuals who transfer from hospital to the stroke units should be prepared to receive high quality specialist rehabilitation from a stroke skilled multidisciplinary team. Components of a multidisciplinary stroke specialist rehabilitation and support includes the following areas

- mobility and movement
- communication
- everyday activities (this includes oral health care)
- depression
- swallow
- nutrition
- cognitive difficulties
- vision and visual perceptual difficulties
- continence
- relationships

### **3.2 Initial Stroke Assessment**

Guidelines for the acute management of stroke emphasise the need for early assessment and investigation of stroke in order to establish the cause and initiate appropriate treatment<sup>[35]</sup> It has been estimated that 1.9 million neurons are lost for each minute a stroke goes untreated. Therefore early recognition and referral to a specialist stroke unit is of utmost importance. Treatment in a Stroke Unit centres around 4 key areas.

- Early mobilisation
- Swallowing assessment
- Prescription of anticoagulation if indicated
- Nutritional assessment

The dental team may have minimal involvement at this stage but oral health as part of personal care should form part of the early stroke unit assessment.

### **3.3 Care Pathways**

Within the DOH National Stroke Strategy<sup>[36]</sup> there are quality measures related to health care services for people who have suffered a stroke. Care pathways aim to promote organised and efficient inter-disciplinary patient care based on the best available care and guidelines. Each health authority in Britain will have a local stroke care pathway accessible via local intranet Map of Medicine.

Some patients who experience stroke will require access to a dental team during rehabilitation for appropriate continuing oral health support.

Unfortunately, the National Stroke Strategy does not mention the need for good oral health support despite the National Clinical Guidelines for Stroke RCP 2004<sup>[37]</sup> and NSF for Older People in Wales both emphasising this.

However, the National Stroke Strategy does highlight certain aspects that are pertinent to dentistry.

Raising awareness of the risk factors, symptoms and referral pathways for stroke is the key to improving stroke prevention and care. The prevention of stroke focuses on lifestyle factors such as increasing exercise, smoking cessation, weight loss and alcohol reduction. The dental profession is well placed to be able to identify some of these risks for stroke and act accordingly<sup>[36]</sup>.

Easily accessible information, advice and support with clear and appropriate signposting plus advocacy support for people who have had a stroke are indicated. Providers of dental services should ensure that useful, current and accessible information is available regarding local dental services that have established a '*stroke skilled dental workforce*'. The Salaried Primary Care Dental Services, the Community Dental Services or Hospital Dental Services, who have specialists in special care dentistry within their team, are ideally placed to be part of a multidisciplinary stroke team. It is important for these services to develop strong links within the care pathways (BSDH 2000). This ensures that early dental intervention and prevention will promote a level of independence among stroke survivors leading to improved quality of life outcomes. Referrals to the '*stroke skilled dental team*' can only be successful if oral health, within the area of personal care, forms part of the overall stroke assessment. The multidisciplinary stroke skilled team should be educated in all aspects of the effects of stroke that impact on oral health.

### **3.4 Specialised Stroke Units and Community Rehabilitation**

There is robust evidence to show that specialised stroke units and stroke rehabilitation teams are invaluable in reducing mortality and prevent long term disability among people who have experienced a stroke.<sup>[38]</sup>

Depending on the level of individual disability, cognitive impairment, dysphagia and communication difficulties a stroke survivor may need to be

transferred/referred to a local Special Care Dentist for continuing oral health care. Within the community, people who have had stroke will be living at home, nursing or in residential care, sheltered accommodation or other specialised units. They may be involved in a network of other support services which should include the dental team.

In order to guarantee client centred continuing care services, reassessments using the Single Assessment Process (Unified Assessment in Wales) and multidisciplinary assessment by the stroke multidisciplinary team should take place at six weeks, six months and at one year subsequent to the initial stroke. It is important that oral health risk assessment (OHRA) is part of the multidisciplinary assessment.

### **3.5 Oral Health Risk Assessment (OHRA)**

Oral health, as part of personal care, should form part of the initial assessment for stroke. The use of an OHRA follows the recommendations of DoH Essence of Care (2001) and the Welsh Assembly Group Fundamentals of Care (2003). At the acute stage of stroke, Speech and Language Therapists or Dysphagia nurses assess for swallowing difficulties to promote early feeding. An assessment of the oral cavity at this stage will assist in identifying for instance, trauma to teeth or fractured/unstable dentures. An example of such an assessment form is included in Appendix 3. The '*stroke skilled dental team*' can then be contacted to stabilise dentures or provide emergency treatment for trauma to teeth or mouth that will help promote the early feeding for stroke patients.

A more comprehensive OHRA may be utilised that identifies oral healthcare equipment and nursing staff assistance needed to care out effective oral care. Continual monitoring of this is required during recovery until independence for oral care is resumed.



Specially adapted oral health care equipment may be necessary and can be identified either by the occupational therapists or the *stroke skilled dental team*.

### **3.6 The ‘Stroke Skilled Dental Team’**

The National Stroke Strategy<sup>[36]</sup> emphasises the need for well trained and skilled teams who have the knowledge and expertise in stroke. A dental team that is skilled in all aspects of stroke and its impact on oral health is recommended to warrant the respect of the multidisciplinary stroke skilled team. An ideal stroke skilled team would have several functions that are listed below

#### *The composition and functions of a ‘stroke skilled dental team’*

- Establish a lead Special Care dentist for stroke within the dental team who is the point of contact, receiver of referrals and co-ordinator of dental services for stroke patients and links into the stroke skilled teams in hospital and community.
- Multi-professional dental team that is able to use all types of skill mix – Special Care dentists, dentists, dental care professionals (including dental technicians) and oral health promoters/educators.
- High quality postgraduate training in stroke that includes prevention, risks, assessment, communication, treatment, rehabilitation, multidisciplinary/multiagency working plus the oral health aspects of stroke and dental care.
- Establish a local stroke oral health care pathway that emphasises the use of an oral health risk assessment to trigger robust mechanisms for referral to the ‘*stroke skilled dental team*’.

- Training, education and support in oral health for all involved in the care for people with stroke.
- Integrated clinical networks that includes other '*stroke skilled dental teams*'.

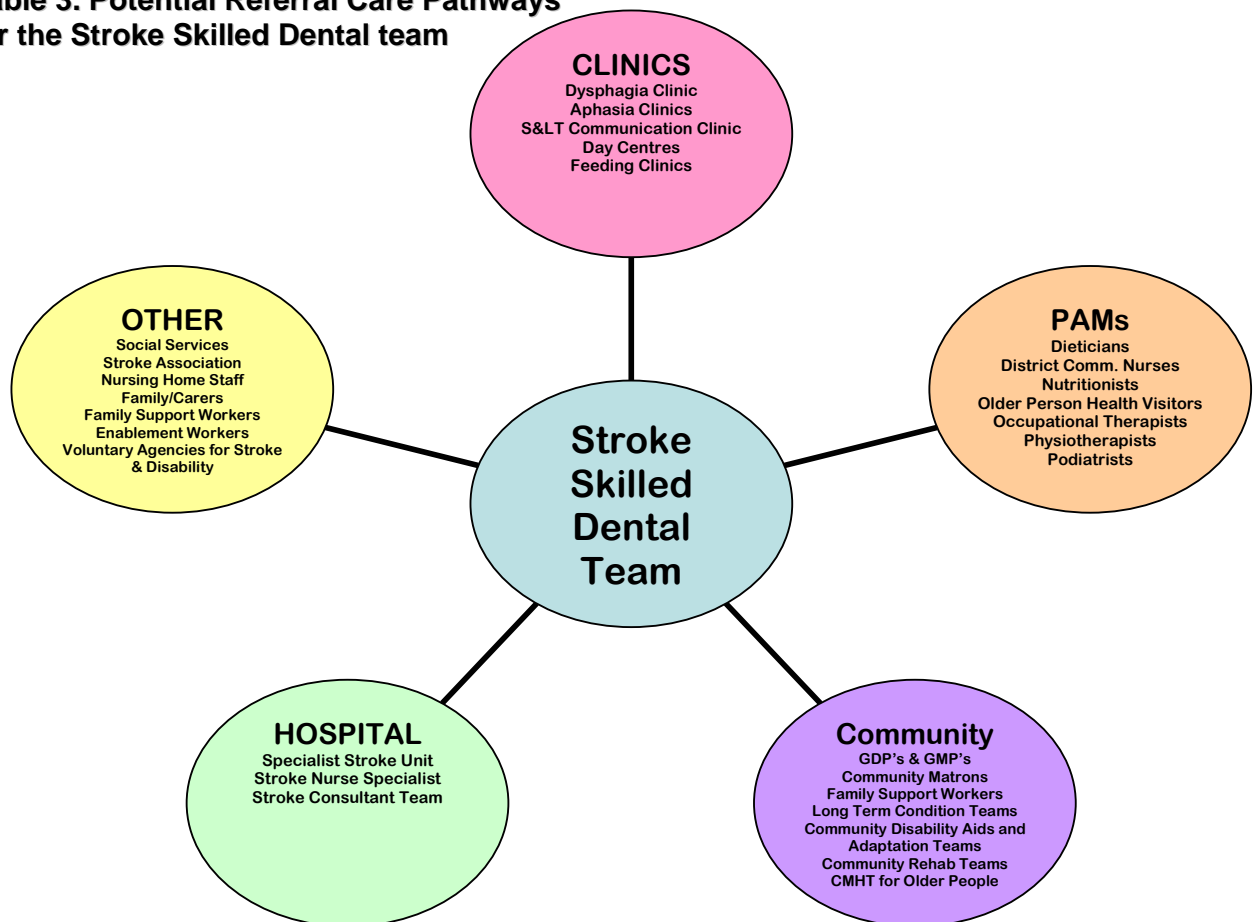
#### Suggested Competencies for the '*stroke skilled dental team*'

- Show evidence of working with stroke teams to highlight oral health care and the use of oral health risk assessments.
- Be familiar with local care pathways including stroke units, day hospitals, day centres and community based services for health, social care and voluntary services for people with stroke.
- Awareness of mobility and transport issues for people with stroke that include handling and lifting risk assessments, mobility aids, awareness of local transport systems, ambulances etc.
- Understanding of dental surgery adaptation requirements for patients with stroke (i.e. wheelchair recliners, hoists, disabled access toilets and parking etc)
- Communication – understanding aphasia, communication difficulties
- Adaptations of oral health equipment
- Consent for cognitively impaired people with stroke
- Where possible, link into stroke multidisciplinary audit and peer review

### 3.7 Referrals for Oral Health Care

Dental services are required to develop robust referral mechanisms for health, social, local authority, voluntary sector and carers as part of the stroke care pathway. The specialist teams and agencies involved in the care of people who have had stroke should be made aware of the local *stroke skilled dental teams* and how to access them. A summary of potential referral pathways is presented in Table 3.

**Table 3. Potential Referral Care Pathways for the Stroke Skilled Dental team**



**Key Points:**

- The multidisciplinary stroke team should include a Special Care Dentist member
- The stroke skilled dental team should have a clearly defined input into stroke management

## **4 Maintaining Oral Health**

### ***4.1 Treatment Planning and Timing of Treatment.***

Dental treatment in the early stages should generally be confined to emergency care and preventive advice. Rehabilitation involves a multidisciplinary effort and while oral and dental health is an important component of this, patients may not yet be able to cope with extensive dental treatment.

The dentist may be called upon to assist with the management of poorly fitting dentures in the early stages following a stroke. An interim form of treatment such as application of a chairside reline material (see section 4.5.1) to a denture may be useful until the patient is able to accept with more extensive oral care.

### ***4.2 Oral hygiene***

There is little published evidence regarding the oral health of people who have experienced a stroke. Life-style factors such as diet, smoking, alcohol consumption, oral hygiene habits and dental attendance prior to a stroke will have an impact on the individual's oral health, as will predisposing medical problems such as diabetes. The symptoms and physical effects of a stroke together with the oral side-effects of medication in stroke therapy will have an impact on oral health requiring extra attention to oral hygiene. Disabled adults who acquire disability later in life and their carers may encounter difficulties in implementing good hygiene<sup>[36]</sup>.

Facial paralysis and loss of sensation can cause food debris to accumulate and pool on the affected side. Impaired swallow may increase the time in which food contacts the teeth; management by moderating food consistency and using thickened fluids increases the risk of dental caries. Dietary adjustments to improve nutritional status with food supplements that are potentially cariogenic and 'sip' feeding further increase the risk of caries. Dry

mouth is the commonest oral side-effect of medication which further increases the risk of caries, periodontal disease, oral infection and denture problems<sup>[39]</sup>

Muscle weakness, loss of dexterity and change in use of the dominant hand may influence the individual's ability to be self-caring for oral and denture hygiene<sup>[40, 41]</sup>. Communication impairment, memory loss and cognitive impairment may also influence oral hygiene and learning skills. The knowledge and skills of carers, whether personal or professional in providing support and delivering oral hygiene need to be addressed.

A high standard of oral hygiene should be maintained in patients with dysphagia, and particularly in those with PEG or NG feeding, in order to promote oral health and comfort<sup>[42]</sup>. Oral care for patients who are dependent, dysphagic or critically ill should follow BSDH guidelines (Griffiths and Lewis, 2002) [Appendix 1]; aspiration during oral hygiene should be available for patients who are dysphagic. The need for appropriate aids for oral and denture hygiene should be jointly assessed by the occupational therapist and a dentist or dental hygienist. These might include the use of electric toothbrushes or brushes with modified handles to aid handling



Fig 1. Toothbrushes with Modified Handles to Aid Handling

There is considerable evidence to suggest that the nursing profession lacks adequate training in oral assessment and appropriate oral hygiene techniques<sup>[43-52]</sup>. Access to staff training, assessments, protocols and oral hygiene materials varied considerably in stroke units in the UK<sup>[46]</sup>; the evidence provides a valuable baseline from which to evaluate the effectiveness of ward-based oral care interventions for stroke patients. Education and training of the

nursing profession needs to receive a high priority in addressing oral health needs and oral hygiene in stroke management.

care plan for oral hygiene should be based on individual assessment of orodental status and risk factors for oral health. This should include dietary analysis, stressors for oral health, oral side-effects of medication and the individual's ability or level of dependence for daily oral hygiene. Assessment should be repeated at regular intervals taking into consideration any changes in physical or cognitive impairment, and medical management. Oral hygiene should be based on specific oral hygiene protocols [Appendix 4], preventive advice for patients on food supplements [Appendix 5], and the recommendations in 'Valuing people's oral health'<sup>[53]</sup>

**Key Points:**

- Maintenance of oral hygiene should form part of a stroke survivors overall care plan
- Brushing the teeth of a stroke survivor with dysphagia should be done using aspiration and a small amount of toothpaste

### ***4.3 Restorative Treatment***

It may be difficult for someone to cope with extensive restorative treatment following a stroke. The aim of treatment should focus on issues which impact on the quality of life of the individual. This will include maximising comfort, dignity and autonomy. Appointment times may need to be reduced to suit the individual's capacity which may result in an alternative approach to treatment planning. Patients may find it difficult to recline in the chair fully and it may be necessary to use some form of support such as a pillow for the affected side. Rubber dam is useful during restorative treatment to protect the airway of a

patient who suffers from dysphagia or who finds it difficult to recline in the dental chair.

### 4.3.1 Root caries

Dental decay and stroke share common risk factors including socioeconomic status, obesity and diet<sup>[54]</sup>; stroke patients are therefore likely to have decay experience. According to the National Diet and Nutrition Survey, root caries is present in 13% of the free living elderly population. This figure is 39% for the institutionalised older population<sup>[55]</sup> which may include many stroke sufferers. An attempt to arrest root caries lesions which are accessible to brushing should be made. This can be achieved by plaque control including the use of chlorhexidine mouthrinse, gel or varnish. Topical fluoride is particularly effective for arresting root caries and again is available in mouthrinse, toothpaste, gel and varnish form. More recently a paste containing amorphous calcium phosphate and casein phosphopeptide (ACP-CPP) has become available (Tooth Mousse). The active ingredients aggregate calcium and phosphate ions on the tooth surface and in dental plaque. These are then released when the pH in the mouth falls, thereby promoting remineralisation.

Where root caries is accessible to toothbrushing an attempt to arrest the lesion should be made by a combination of plaque control and fluoride application. Lesions requiring restoration are often interproximal and therefore the most difficult to access. It may be possible to excavate smaller lesions and smooth the cavity surface without restoration. The surface may therefore be more amenable to preventative measures. For patients who find it difficult to cooperate or who are seen outside of the surgery atraumatic restorative treatment (ART) may be indicated. Soft caries is excavated with hand or rotary instruments. Alternatively chemo mechanical methods (e.g. Carisolv®) may be used. The lesion, which may not be caries free, is then restored with glass ionomer cement which is the material of choice for root caries lesions. The cavity must be adequately sealed to prevent further ingress of bacteria and protect the pulp from insult.

### 4.3.2 Fixed Prosthodontics (Bridges)

Planning advanced restorative treatment for the stroke survivor is done on a basis of an individual want and need. Such treatment is unlikely to be appropriate in the early stages (first few months) of stroke recovery but may form part of longer term rehabilitation. Treatment plans should be kept as simple as possible and restorations planned to allow the patient to maintain hygiene.

It may be difficult for the individual to cope with the extensive surgery time that may be needed for conventional fixed prosthodontics. Consideration needs to be given as to whether missing teeth really need to be replaced. Advising against the replacement of missing teeth may sometimes be a more appropriate option when taking into account the problem of maintaining hygiene around fixed bridges. The acceptance of the shortened dental arch as a treatment concept has been recognised for some time<sup>[56]</sup>. The decision to accept missing teeth will depend on the wishes of the patient, functional and aesthetic concerns and the stability of the occlusion.

Adhesive bridgework to replace single units of missing teeth may prevent the need for a denture. This technique requires little or no preparation of abutment teeth. Cantilevered resin bonded bridges have been shown to have higher survival rates than fixed – fixed designs in most situations<sup>[57]</sup> and may be easier for the patient to keep clean. If occlusal space is limited it may be possible to cement the retainer ‘high’ and allow the occlusion to re-establish by local axial tooth movement<sup>[58-60]</sup>. It is important that a programme of preventive maintenance is instituted before complex restorative treatment is provided.



### 4.3.3 Extractions

Stroke survivors may take anti platelet medication or oral anticoagulants as part of their ongoing medical care. Current evidence suggests that anti platelet therapy with aspirin does not need to be discontinued prior to simple extractions<sup>[61]</sup>. Similarly, Warfarin should not be withdrawn prior to dental extraction, but the patients INR (International Normalised Ratio) should be tested within 24 hrs prior to the procedure. If the INR is less than 4.0 then up to three extractions may be carried in one appointment and the socket(s) packed with an absorbable haemostatic material and sutured to control post operative bleeding<sup>[62, 63]</sup>. Recent evidence suggests that suturing may not be effective in providing additional haemostasis but should be considered on a case by case basis<sup>[64]</sup>

### 4.4 Periodontal Disease

The periodontal health of people with stroke is poorer than for individuals unaffected by stroke. There is evidence that they have higher levels of plaque, bleeding on probing and increased periodontal pocketing<sup>[65]</sup>. Periodontal health and stroke are both associated with smoking<sup>[66]</sup>, therefore individuals affected by stroke may have underlying periodontal disease.

There has been much interest in recent years on the association between periodontal disease and the incidence of stroke. Atherosclerosis is the main aetiological factor of embolic stroke and is the result of chronic inflammation in arteries. Periodontal disease is also a chronic inflammatory disease. It has been proposed that the inflammatory response to and pathogens associated with periodontal disease may actually contribute to atherosclerosis and thereby increase the risk of stroke. Several epidemiological studies have shown that a link exists<sup>[67-70]</sup>. However, it is difficult to prove conclusively that periodontal disease increases the degree of atherosclerosis (and thereby the risk of stroke) because they are both complex multi factorial conditions which share a common aetiological factor in smoking.

Epidemiological surveys such as the first National Health and Nutrition Examination Survey (NHANES I). have investigated the association between periodontal disease and Stroke<sup>[69]</sup>. In this survey it was concluded that periodontal disease was a significant risk factor for non haemorrhagic stroke. Patients with periodontal disease were judged to be twice as likely to have a non haemorrhagic stroke as those without. The method used to classify periodontal disease was crude but the authors felt that this would lead to an underscoring of the risk.

The third National Health and Nutrition Examination Survey (NHANES III)<sup>[71]</sup> compared stroke history with the degree of periodontal attachment loss. Some degrees of attachment loss were associated with an increased risk of stroke. The authors were unable to conclude that the periodontal disease was a definite risk factor as the strongest association was not demonstrated in those with the greatest degree of attachment loss. It may be that periodontal disease is a risk marker for stroke.

The 'Inflammation and Carotid Artery Risk for Atherosclerosis Study' (ICARAS) showed a small but significant correlation between progression of carotid artery stenosis and higher DMFT and plaque index. In particular the number of missing teeth showed a strong correlation with disease progression. There was no correlation between increasing stenosis and higher CPITN scores which the authors attributed to the high number of edentulous patients involved in the study. The authors concluded that 'oral hygiene and particularly tooth loss are associated with the degree of carotid stenosis and predict future progression of disease'<sup>[68]</sup>. However, it is important to be cautious when interpreting the results of a single study. In a separate study, McMillan et al<sup>[7]</sup> found that there was no significant difference in DMFT scores of stroke survivors and a comparison group.

It is possible that good dental health may reduce the incidence of stroke and the dental team may help in this respect by careful management of periodontal disease and offering lifestyle advice such as smoking cessation.

Patients who have had a stroke should be viewed as a priority for periodontal treatment and recall intervals should be reduced to assist continual maintenance in accordance with NICE guidance<sup>[72]</sup>.

## **4.5 Prosthodontic Management**

There is limited evidenced based research relating to prosthodontic management of people who have had stroke. Clinical experience and anecdotal case reports indicate that hemiplegia following a stroke may present particular problems with denture wearing. People who wear dentures need to develop a degree of muscular control to maximise stability. Muscular control develops partly as a result of tactile feedback which may be diminished following a stroke. Edentulous people with facial paralysis following a stroke have a reduced ability to correctly detect the shape of objects placed in the mouth in comparison to an edentulous control group<sup>[73]</sup>. Providing such patients with new dentures can improve this ability. In a similar study people who had strokes took longer to detect the shape of objects placed on the tongue than a control group. Wearing dentures improved the response time<sup>[74]</sup> suggesting that patients should be encouraged to wear their dentures following a stroke and that improvement in the fit of the denture will assist with chewing and swallowing.

### **4.5.1 Complete Dentures**

#### **Rebasing**

Where the fit surface or extension of an otherwise favourable denture is deficient a reline or rebase may be indicated. Rebasing an existing denture is a relatively straightforward procedure and this may be a distinct advantage for the debilitated patient. However, care must be taken to avoid extensive changes to a denture where the adaptive ability of the patient is in doubt. In these situations it may be better to remake a denture using a copy technique.

Rebasing or relining a denture may be done at the chairside or using a laboratory stage. A laboratory reline will have a better surface finish and be more durable, however it does involve the patient being without the denture for a period of time. Chairside materials are marketed as permanent but they usually require replacement after one year due to their deterioration.

Temporary soft lining materials or tissue conditioners are useful to provide an improvement in the fit surface of a denture. This may allow a patient to continue wearing a denture in the period immediately after a stroke where loss of muscle control is at its greatest. If tissue conditioners are used to extend dentures and are well tolerated the denture may then be copied. Tissue conditioners may be used as rebase impressions if left in situ for six hours. These materials are porous and difficult to keep clean so regular review is required.

Denture fixatives may occasionally be recommended for use with an unretentive upper denture particularly in the early stages of rehabilitation. However, any underlying cause for the lack of retention should be addressed as soon as is feasible.

### **Sulcus Elimination**

Food may collect on the buccal surface of a lower complete denture on the side of facial paralysis. This may be prevented by adding an acrylic resin which is suitable for intra oral use, such as temporary crown material, to the buccal polished surface of the denture on the affected side<sup>[75, 76]</sup> to fill the sulcus. Acrylic is added to the level of the lower teeth so it may be necessary to adjust the buccal surfaces of the upper denture teeth. If the sulcus eliminator is well tolerated and facial paralysis does not improve the denture can be copied with the alteration to the polished surface intact. Placing the lower posterior denture teeth further buccally on the affected side, when making new dentures, may also reduce the problem of food stagnation.

## Replacement Dentures

Careful consideration needs to be given as to whether replacement dentures are necessary. It is important to establish the benefit that the individual may obtain from new dentures and weigh this up against potential problems in adjusting to the new prosthesis. Replacement dentures should ideally be extended as much as possible on the denture bearing area in order to maximise their retention, support and stability. This is often done using a special tray made on a primary cast which requires two visits for the impression stage. Tooth position is determined by carving wax occlusal rims to approximate the position of the patient's natural teeth. Biometric guidelines may be used for the adjustment of the rims. A neutral zone technique (piezography) for recording the shape of the lower arch and polished surfaces may be particularly helpful where muscle control is reduced.

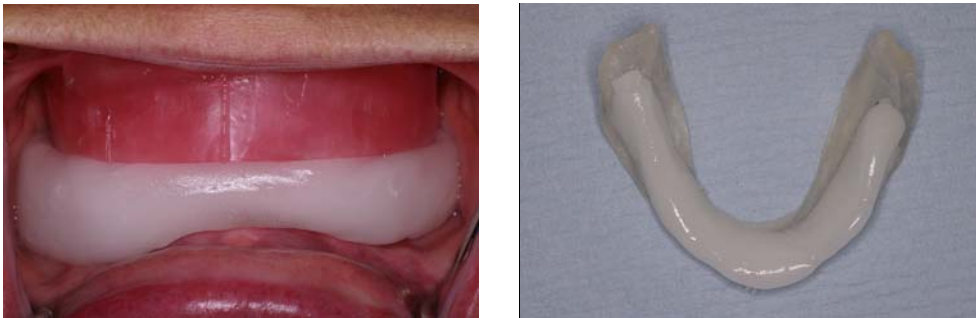


Fig2 a & b. Lower piezograph in situ against carved upper rim. Note the buccal position formed by tongue pressure

A conventional technique is not always the ideal approach for making new dentures. Some patients may have dentures that they have worn successfully for a number of years or they may not be able to cope fully with the procedures required for conventional replacement dentures. In these situations a copy technique is helpful. It is unusual to make a copy denture without making some changes in the design such as improving the fit surface or increasing the vertical dimension. This can be done on a trial basis on the existing denture prior to the copy being made. It is therefore possible to assess the affect of these changes while retaining successful features of the old denture. Different methods are available for copying dentures<sup>[77, 78]</sup>.

Whichever method is chosen it is important to pay attention to careful technique to prevent the introduction of unwanted errors.



*Fig3. Lower complete denture modified with wax and compound prior to copying. Corrections have been made to the level of the occlusal plane and border extension*

#### **4.5.2 Partial Dentures**

Partial dentures should be designed to be as hygienic as possible by reducing coverage of gingival margins. Coverage of gingival margins by denture components has been demonstrated to increase the amount of plaque in the wearer's mouth <sup>[79, 80]</sup>. Hygienic design is best achieved by using a metal framework which can incorporate features to maximise tooth support and avoid excess coverage<sup>[81]</sup>. The design may need to incorporate features such as metal backing on teeth with a doubtful long term prognosis. This will facilitate the addition of prosthetic teeth to the denture if further tooth loss occurs.

Acrylic resin dentures may be more suitable if the remaining natural teeth are of a poor prognosis. They should be designed to be clear of the gingival margins where possible although this is usually only achievable in the upper arch. The junction between acrylic and tooth surface should be sited as high on the lingual / palatal tooth surface as possible to provide some degree of support. Coverage at the gingival margin should be minimised to prevent the 'gum stripping' action of poorly supported dentures. This is achieved by asking the technician to block out such areas with plaster prior to processing the denture.

People with hemiplegia may find it difficult to insert and remove dentures with one hand. This will be particularly evident if the stronger side is affected. Guide planes on the teeth should be used to facilitate a smooth path of insertion and withdrawal. Consideration should also be given to reducing the number of clasps if sufficient abutment teeth remain. The labial flange of a denture may be notched to allow the insertion of a finger nail or 'pick' to facilitate removal.

Marking new or existing dentures with the patient's name or initials may be considered and should only be done with consent. This may assist recovery of the denture in the event that it is lost. Denture marking kits are commercially available and are quick and easy to use. Markings made with these kits tend not to be as long lasting but may be sufficient for an extended stay in hospital.



*Fig 4. Denture Baseplate with name in situ for identification*

#### **4.6 Dry Mouth (Xerostomia)**

Evidence suggests that the prevalence of xerostomia in the elderly population is approximately 30%<sup>[82]</sup>. Prescribed drugs are the most common cause of xerostomia and may be a side effect of up to 80 % of the most commonly prescribed medications<sup>[39]</sup>. Anti hypertensive drugs which are commonly prescribed to people who have had or who are at risk of a stroke may lead to xerostomia.

Frequent oral complaints of xerostomia include altered taste, difficulty in chewing and swallowing<sup>[83]</sup> and insufficient retention of or discomfort under

removable dentures. The issue of swallowing is particularly relevant for people who have had a stroke as it can compound the dysphagia that result directly from the cerebral damage caused by the stroke. Chronic burning sensation, intolerance of spicy foods and halitosis may also occur as a result of xerostomia.

Clinical signs of xerostomia can include:

- Dryness of the mucosa
- Absence of pooling of saliva
- Frothy appearance to the saliva
- Thick 'ropey' saliva
- Furrowing and/or furring of the tongue.

The soft tissues are at particular risk of infection, notably candidiasis. Lips may become dry and cracked so will need protection especially prior to dental treatment. If teeth are present they are at risk of caries as the protective influence of both the washing and buffering effects of saliva are reduced and clearance of food from the mouth may be poor. Root surface caries (decay) is more prevalent in a dry mouth. Surfaces which are not usually at risk of caries such as the incisal edges of anterior teeth and the cusps of premolars and molars may also be affected.



*Fig 5. Extensive caries associated with Xerostomia*

Dental management of people with xerostomia is difficult. Occasionally it may be possible to alter the person's medication to one with reduced xerostomic



side effects although this should only be done in consultation with their medical practitioner. The National Clinical Guidelines for Stroke (2008)<sup>[84]</sup> advises that blood pressure should be controlled by Thiazide diuretics or Angiotensin Converting Enzyme (ACE) inhibitors or a combination of both. Therefore the options for altering anti hypertensive medication are limited. If medication is in a syrup-based form, liaison with the practitioner to change to a sugar-free medicine can at least reduce the risk of dental caries. Taking medication during the daytime may reduce nocturnal xerostomia which is a particular patient complaint.

Dehydration is an underreported problem in older people and may contribute to dry mouth. Assuming that the swallow is unimpaired, people should be encouraged to drink water frequently to mitigate dehydration. Sugar free varieties of chewing gum, sweets and mints may all be used to stimulate saliva production. Sialogogues (drugs that increase salivary flow) such as Pilocarpine are not indicated for the management of xerostomia related to the use of other medication.

Saliva substitutes are helpful in the management of xerostomia, however, their effects can be short-lived. They are available in the form of mouthrinse, spray or gel. As they serve to moisten and lubricate the mouth they may be particularly helpful before eating or before an important conversation. A comparison of a saliva substitute with sugar free chewing gum showed that both were effective in managing xerostomia, however, patients tended to prefer gum<sup>[85]</sup>. A more recent study<sup>[86]</sup> found chewing gum to be more effective than artificial saliva although the former should only be proposed in people with a normal swallow. For dentate patients a saliva substitute, if prescribed, should contain fluoride and have a neutral pH. Similarly a spray containing casein phosphopeptide and amorphous calcium phosphate (Dentacal) has been shown to be an effective mouth moistener with the added benefit of anti caries activity<sup>[87]</sup>. This product is not yet commercially available in the UK at the time of writing.

Acupuncture may be of some use in the management of dry mouth. Acupuncture has been shown to increase salivary flow in healthy individuals<sup>[88]</sup> and is a treatment modality which may be practiced by dentists who have undergone appropriate training.

#### **4.7 Barriers to Oral Healthcare**

A range of stroke symptoms affect mobility. These include muscle weakness, paralysis, disturbances in sensation, spasticity, balance problems and visual impairment. Balance is affected by muscle strength and joint flexibility. Fall related injuries are among the most common complications after a stroke and inevitably have an impact on mobility. After a year, approximately two thirds will have regained the ability to walk<sup>[89]</sup>; however this still leaves a significant number with severe mobility impairment, and others with mobility limitations and at risk from falls.

Information, access and transport are consistently quoted by disabled people as being the key to independence and choice<sup>[40]</sup> and these will also influence the uptake of oral health care<sup>[41, 90-95]</sup>. Removing barriers to disabled people's participation and access to services is now a legal requirement of the Disability Discrimination Act (1995)<sup>[96]</sup>. RCP Guidelines provide a useful audit tool for assessing accessibility and barriers to disabled people using health care facilities<sup>[97]</sup>. The implications of the Disability Discrimination Act for dental services are summarised<sup>[98]</sup> and where premises create a physical barrier to accessing oral health care, it is requirement that a reasonable alternative service is offered eg domiciliary oral health care.

Mobility impairment is not the only barrier to accessing oral health care. Inability to express need due communication and/or cognitive impairment, fear and anxiety, inability to cooperate, and dependence on others to access mainstream services are problems that disabled people experience<sup>[50, 99]</sup> including impairment or disability caused by a stroke. Within residential and

continuing care facilities, negative attitudes to oral care and inadequate knowledge of health care professionals and health care workers militate against access to oral health care<sup>[50, 51]</sup>. Guidelines for the nursing profession to develop standards for oral health care in residential care facilities (Appendix 6) and for the development of local standards (Appendix 7) are required to address these barriers.

## 5. Useful Resources

### Websites:

- AgeUK [www.ageUK.org](http://www.ageUK.org)
- British Society for Disability and Oral Health [www.bsdl.org.uk](http://www.bsdl.org.uk)
- National Stroke Strategy  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationPolicyandGuidance/DH\\_081062](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationPolicyandGuidance/DH_081062)
- National Clinical Guidelines for Stroke 2004:  
[http://www.rcplondon.ac.uk/pubs/books/stroke/stroke\\_guidelines\\_2ed.pdf](http://www.rcplondon.ac.uk/pubs/books/stroke/stroke_guidelines_2ed.pdf)
- National Institute for Health and Clinical Excellence [www.nice.org.uk](http://www.nice.org.uk)
- Stroke Association [www.stroke.org](http://www.stroke.org)

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## 7. Appendices

### **Appendix 1. Oral Management Of Dependent Or Dysphagic Patients**

#### **Summary of oral care for the dependent patient**

Prepare appropriate oral hygiene materials  
Place the patient in a sitting or semi-fowler's position to protect the airway  
Protect clothing  
Remove dentures or other removable appliances

- **Dentate patient**

If necessary insert a mouth prop to gain access  
Floss interproximal surfaces of teeth, taking care not to traumatise gingivae  
Brush all surfaces using Fluoride toothpaste or Chlorhexidine gel.  
(Remember that traditional foaming agents in tooth-paste inactivate chlorhexidine so use one or other or alternate their use, at different times of the day).  
Rinse or aspirate to remove saliva and toothpaste

- **Dentate and edentulous patients**

Gently retract cheeks and brush inside surfaces with soft, gentle strokes  
Using gauze to hold the tongue, gently pull the tongue forward and brush surface gently from rear to front  
Gently brush palate  
Towel or swab mouth if toothbrushing is not possible  
Aspirate throughout procedures if airway is at risk

- **Dentures and removable appliances**

Brush vigorously with unperfumed household soap  
Pay particular attention to clasps  
Rinse well in cold water  
Saliva substitute may be required before replacing denture in the mouth

- **Intubated patients**

Reposition tube frequently to prevent lip soreness  
Ensure tube is secure before proceeding with oral care  
Proceed with oral care as appropriate.

*Reproduced from Griffiths and Boyle, 1993*

## **Appendix 2. Tips for communicating with individuals with Aphasia**

- Avoid being condescending, treat the aphasic person as the mature adult that (s)he is
- Choose a quiet place with few distractions. Background noise and more than one person speaking at once can make it hard to follow a conversation
- Ensure eye contact before starting to speak, so that facial expressions and gestures will provide clues about the message you are trying to get across, even if (s)he finds the words hard to follow
- Use short sentences; allow plenty of time for her/him to absorb what you have said and to respond
- Be comfortable listening to periods of silence without feeling the need to speak
- Talk with a normal voice but at a slightly slower speed than usual
- Ask direct questions, for example "Do you want a cup of tea?" rather than, "What would you like to drink?"
- Give only one piece of information at a time
- Check you have both understood. Don't pretend you have understood when you haven't!
- Repeat statements where necessary and emphasize key words
- If you are not understood the first time, try saying the same thing using alternative words
- Do not finish the person's statements for them. However if they get stuck for long periods of time help them to search for words
- Augment speech with gesture and visual aids where possible
- Have a pen and paper handy, as some people can read or write better than they can speak. Sometimes drawing the message or using other 'props' (pictures, photographs and real objects) can help
- Ask closed 'yes' / 'no' questions as they are easier to answer than open questions that need a full answer
- Use gestures (thumbs up or down) or point to a symbol (tick, cross, smiley face, unhappy face) to check meaning, as it is common for people with aphasia to mix related words (such as 'yes' and 'no' or 'he' and 'she')

Source: Access to Special Care Dentistry Part 2: Communication. BDJ 2008 Vol 25(1): 11- 21



### Appendix 3: Basic Oral Health Assessment

A response in a highlighted box may signify a need for action.

Name: \_\_\_\_\_ Date of birth: \_\_\_\_\_  
 \_\_\_\_\_  
 Mr / Mrs / Miss / Ms  
 Address: \_\_\_\_\_  
 \_\_\_\_\_  
 Telephone: \_\_\_\_\_

1. Does the client have natural teeth? No  Yes

2. Does the client have dentures? No  Yes  Specify: Upper  Lower   
 a) If Yes, are dentures labelled? Yes  No  Don't Know   
 b) If Yes, how old are dentures? Less than 5 yrs  More than 5 yrs  Don't Know

3. Does the client have any problems? No  Yes  Don't Know   
 e.g pain, difficulty eating, decayed teeth, Teeth  Gums  Denture  Other   
 denture problems, dry mouth, ulcers, halitosis, other etc. If Yes, describe problem

4. Has the client ever smoked? No  Yes  Current smoker  Don't know

5. Is the client on medication with oral side effects? No  Yes  Don't Know

6. Does the client need urgent dental treatment? No  Yes  Don't Know

7. When did the client last see a dentist? Less than 1 year  More than 1 year  Don't know

8. Is the client registered with a dentist? Yes  No  Don't Know   
 If Yes, record name and address of dentist: \_\_\_\_\_  
 \_\_\_\_\_

Signature:.....(Job title).....

Date.....

Adapted from BSDH Guidelines - Gerodontology (2000), 17(1): 62

## **Appendix 4. Specific Oral Hygiene Protocols**

### **Dentate persons (with natural teeth)**

Lips should be kept clean and moist. If dry or cracked, clean with water moistened gauze and protect with a suitable lubricant.

All patients should have their own toothbrush that should be replaced every three months.

Natural teeth should be cleaned with fluoridated toothpaste after every meal, but at least twice daily.

Partial dentures must be removed and cleaned separately.

A dental hygienist or dentist should provide professional instruction and advice on oral hygiene for people with complex dental work eg bridges.

If a patient is too unwell for normal oral hygiene techniques, professional dental advice should be sought.

Consider use of Chlorhexidine mouthwash, spray or gel (Corsodyl) for additional plaque control.

### **Edentulous persons (with no natural teeth)**

Lips should be kept clean and moist. If dry or cracked, clean with water moistened gauze and protect with a suitable lubricant.

Remove dentures before carrying out oral hygiene.

Check that the lining of the mouth is clean.

Brush oral mucosa with a small soft toothbrush moistened with water.

If brushing is difficult, clean oral mucosa with gauze.

## Care of dentures

Dentures should be brushed twice daily to remove all plaque and food debris.

Dentures should be rinsed thoroughly after meals.

Brush dentures over a sink of cold water using un-perfumed household soap or Chlorhexidine.

Rinse thoroughly in cold running water before replacing in the mouth.

Check dentures regularly for cracks, sharp edges or missing teeth; if necessary, seek dental advice.

Dentures should not be worn at night and soaked in a suitable cleansing solution

1 part Milton 1% to 80 parts of water for plastic dentures

Chlorhexidine solution (Corsodyl 0.2%) for dentures with metal parts.

All dentures should be marked with the owner's name.

## Management of dry mouth

Ask the patient on a daily basis if their mouth feels dry or uncomfortable.

If lips are dry or cracked, clean with water moistened gauze and protect with a suitable lubricant.

Ensure that oral mucosa is kept clean.

Provide oral lubrication eg

Water (sips or spray)

Sucking ice chips

Artificial saliva substitutes.

Encourage sugar free lubrication for dentate persons.

Lips should be kept clean and lubricated.

Check for development of oral infections and seek dental advice.





## ROUTINE MOUTH CARE – KEY POINTS

Explain the importance of good oral hygiene.

When possible, teach and encourage patients to carry out their own oral hygiene.

Use a torch when examining the mouth.

Wear disposable gloves and check first for latex allergy.

Note any unusual appearances inside the mouth and seek advice as necessary.

If dental treatment is required, ask for dental advice. Dentists may be able to make a home visit if necessary.

Patients with complex dental work should be seen by a dentist for advice on mouth care.

Mouth care may seem difficult and unrewarding, particularly for very ill patients. Sometimes the patient's condition does not allow complete mouth care to be carried out. However, it is essential to provide as much care as the patient can tolerate, in order to prevent soreness of the mouth and permit comfortable eating, drinking and speech.

*Source: BSDH Guidelines*

## ***Appendix 5. Oral care for people on food supplements and sip feeding***

Adequate nutrition is essential for health and function. Malnutrition predisposes to disease, delays in recovery from illness and is essential for tissue viability. If insufficient energy cannot be achieved by normal food and drink intake, nutritional food supplements may be prescribed. Patients with natural teeth who take oral food supplements have a greater risk of developing dental decay. This is partly due to the content of the food supplement and recommendations to 'sip' feed throughout the day; the risk of dental caries increases if the patient is taking medication that causes dry mouth.

It is essential that professional nutritional advice is followed. The potential harmful effects on the patient's teeth can be minimised by a preventive programme.

- **The most effective behaviour is twice daily tooth-brushing with fluoride toothpaste. The patient may need assistance with this.**
- **After brushing, spit out or aspirate toothpaste. Avoid rinsing in order to maximise the effect of fluoride.**
- **Use toothpaste that contains 1450ppm fluoride. Specialist Fluoride toothpaste containing 2500-5000 ppm fluoride can be prescribed by a dentist.**
- **Fluoride varnish may be applied to the teeth by the dental team.**
- **Frequent sips of water throughout the day and rinsing with water after taking food supplements is beneficial.**
- **If the patient has a dry mouth, frequent sips of water, ice chips and appropriate**
- **Saliva substitutes are recommended.**
- **Using a straw can help to minimise contact between food supplement and the tooth surface, and reduce the risk of decay.**

Source: BSDH Guidelines

## **Appendix 6. Nursing Standards For Oral Health In Continuing Care**

### **Standards for oral health must address:**

- Needs of residents / clients
- Knowledge
- Environment
- Equipment
- Oral hygiene practices
- Resources

### **STANDARD**

Residents will have equal opportunity for good oral health as the self-caring individual.

### **STRUCTURE**

All qualified nurses will have a basic knowledge and understanding of the importance of oral health and disease.

Oral assessment will be used to identify oral status and oral hygiene needs. There will be a clear referral procedure for routine and emergency dental advice and treatment.

Oral hygiene equipment appropriate to a resident's needs will be available.

Standard equipment will include:           Tooth brushes

                                                          Toothpaste

                                                          Denture brush

                                                          Denture bowl

Specific oral hygiene aids recommended by the dental team will be available.

Residents will have access to privacy for oral hygiene.

Information will be available for residents / staff.

### **PROCESS**

A baseline oral assessment will be carried out to identify the resident's oral status and risk factors.

After assessment, the resident will be provided with equipment appropriate to their oral needs.

Oral assessment will be repeated at specified intervals to monitor the effectiveness of oral care.

Oral hygiene will be carried out as specified and according to resident's needs.

Staff will support, motivate and assist residents to carry out oral hygiene as necessary.

### **OUTCOME**

Identified oral care plan for resident's needs.

Provision of appropriate oral hygiene equipment and regular oral assessment will seek to maintain and prevent deterioration in the resident's oral status.

To maintain oral health, enhance oral comfort, prevent oral disease and

handicap.

*Source: BSDH Guidelines - Gerodontology (2000), 17(1): 63*

## **Appendix 7. Recommendations To Develop Local Standards For Oral Health In Residential And Continuing Care**

1. Liaison between health, social and voluntary agencies to identify residential and continuing care establishments without a dental service or with inadequate access to dental services.
2. Screening programmes to identify base line data for dental service planning and oral health promotion strategies appropriate to residents' needs.
3. Oral assessment criteria on admission to identify:
  - a) risk factors for oral health
  - b) individual oral care needs and develop an oral care plan
  - c) appropriate oral hygiene equipment
  - d) preventive and palliative measures
  - e) need for and access to dental services
4. A policy on the care and safe-keeping of a resident's dentures to include:
  - a) denture labelling on admission with the resident's consent
  - b) responsibility for the cost of replacement dentures if lost or mislaid.
5. Dental input to multi/inter-disciplinary assessment where appropriate including
  - a) procedures for access to pain relief, appropriate general and specialist dental services, oral hygiene advice and support
  - b) support for health professionals and carers in oral care
  - c) procedures for ensuring continuity of dental care on discharge.
6. Training for health care professionals in:
  - a) the scientific basis of oral health and disease
  - b) oral assessment criteria and tools for oral assessment
  - c) identification of risk factors and stressors for oral health
  - d) current oral care practices appropriate to individual needs
  - e) practical oral care to motivate, encourage, support and assist residents to carry out oral, dental and denture hygiene
  - f) eligibility for free or partial exemption for the cost of NHS dental care
  - g) accessing local dental services.
7. Oral health advice and support for residents, family and carers, appropriate to their needs.
8. Oral health education and promotion for residents, carers and health professionals which address:
  - a) the oral health needs of residents
  - b) dietary issues in the context of healthy eating for oral and general health.
9. Facilities for privacy, dignity and comfort for personal oral hygiene and on site dental screening, assessment and treatment.
10. Negotiated standards and procedures for oral health which promote a structure and process for putting theory into practice and which can be monitored / audited.

Source: BSDH Guidelines - Gerodontology (2000), 17(1): 64