

**Supporting**  
*Excellence*  
**in Stroke Care**



# STROKE EDUCATION WORKBOOK FOR DIETITIANS

Name:

## ACKNOWLEDGMENTS

The original workbook was designed by a team of St George's Hospital physiotherapists.

This version has been adapted and amended for use with dietitians and students.

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## RESOURCES

### You will need to read and refer to the following documents:

#### FOOD Trials

Dennis et al, 2005. Routine oral nutritional supplementation for stroke patients in hospital (FOOD): A multicentre randomised control trial. Lancet. 365 February 26 pp755-763

Dennis et al, 2005. Effect of timing and method of enteral tube feeding for dysphagic stroke patients(FOOD): A multicentre randomised control trial. Lancet. 365 February 26 pp 764-772

NICE guidelines for Stroke 2008: [www.nice.org.uk/http://guidance.nice.org.uk/C968/niceguidance/pdf/english](http://www.nice.org.uk/http://guidance.nice.org.uk/C968/niceguidance/pdf/english)

Royal college of physicians 2008: Access through NICE website [www.nice.org.uk](http://www.nice.org.uk)

### Suggested reading:

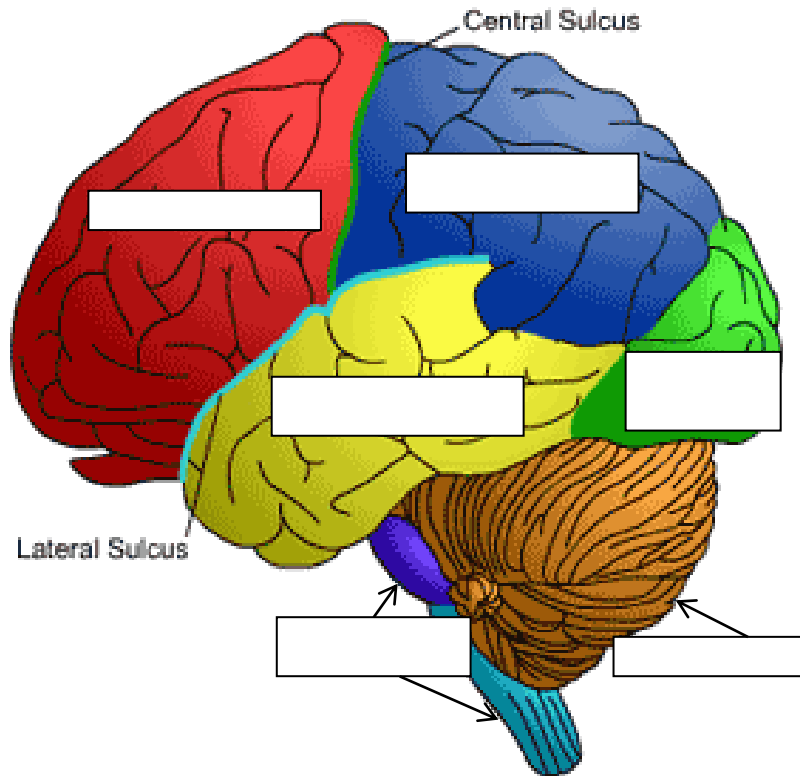
- Nutrition and Dietetics Concise Guide for Stroke; extracted from NICE guidelines for Stroke 3<sup>rd</sup> edition, 2008 (obtain via internet search)
- Stroke Medicine, Hugh Markus, Anthony Pereira & Geoffrey Cloud. Oxford Specialist Handbooks.
- STARS competencies: [www.strokecorecompetencies.org/node.asp?id=home](http://www.strokecorecompetencies.org/node.asp?id=home)
- Chapter on stroke in Dietetics Manual 4<sup>th</sup> Edition. Section 4.23.
- National Descriptors for Texture Modification in Adults, revised April 2011

## TASKS FOR COMPLETION

	Date completed	Supervisor signature
Task 1: MDT	.....	.....
Task 2: Modified consistency diet	.....	.....
Task 3: Modified fluids	.....	.....
Task 4: Patient observation at meal times	.....	.....
Task 5: Videofluoroscopy	.....	.....
Task 6: NG placement	.....	.....
Task 7: PEG placement	.....	.....
Task 8: Communication	.....	.....

## BRAIN ANATOMY

Label the parts of the brain:



What are the basic functions of each part of the brain?

Frontal lobe:

Parietal lobe:

Temporal lobe:

Occipital lobe:

Brainstem:

Cerebellum:

## Complete the following stroke related definitions

TIA (Transient Ischaemic Attack):

Cerebral infarct:

Cerebral haemorrhage:

What percentage of strokes are ischaemic?

What percentage of strokes are haemorrhagic?

What proportion of all strokes are fatal?

What type of stroke is more fatal, ischaemic or haemorrhagic?

## STROKE CLASSIFICATION

A stroke is caused by the interruption of the blood supply to the brain, usually because a blood vessel bursts or is blocked by a clot. This cuts off the supply of oxygen and nutrients, causing damage to the brain tissue. (WHO)

Stroke is clinically defined by:

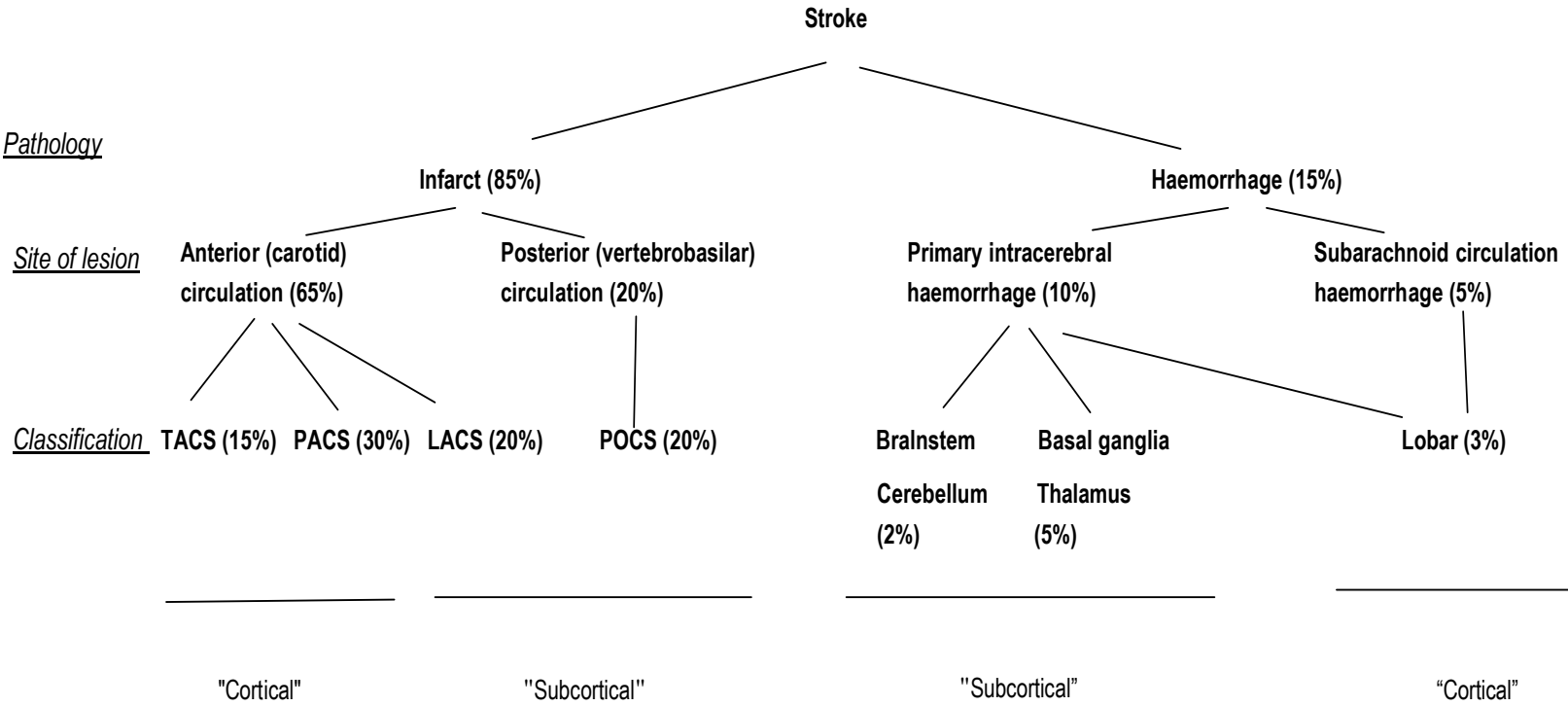
- Pathology; infarct or haemorrhage
- Mechanism; Ischaemic or embolic
- Syndrome

The stroke syndromes are defined using a classification system known as Oxford Acute Stroke Classification system or Bamford or Oxford classification. You will see stroke syndromes referred to as; **TACS, LACS, PACS or POCS**. This definition brings together the pathology of the stroke and site of the lesion. Each classification has a collection of signs associated with it. For example a patient diagnosed with the stroke syndrome TACS (Total Anterior Circulation Syndrome) will have exhibited the following symptoms;

- Motor and/or sensory deficit on one side of the body (ipsilateral) and in at least two areas out of the face, arm and leg
- Homonymous visual field deficit
- New higher cerebral dysfunction e.g. aphasia



### Stroke Classification



Key: **TACS** -total anterior circulation syndrome    **PACS** - partial anterior circulation syndrome,  
**LACS** -lacunar syndrome    **POCS** - posterior circulation syndrome

**Cortical versus subcortical definition of problems is less precise for haemorrhage**

Reference: Hospital Education Learning Programme (HELP) for Stroke

## THROMBOLYSIS

**Thrombolysis: a pharmacological intervention which results in the lysis or breakdown of a clot. In stroke patients' the aim of the intervention is to increase the chances of a full recovery**

- In patients diagnosed with an acute ischaemic stroke thrombolysis has been shown to significantly improve outcome in selected patients. It will benefit up to 10% of all stroke patients.
- Patients who are admitted to a HASU (hyper acute stroke unit), which is a specialised unit with appropriately trained medical and nursing staff, are assessed for thrombolysis. The unit must also have quick access to CT imaging.
- The drug used is called alteplase (also known as tissue plasminogen activator or tPA)
- . The following criteria are considered:
  - Haemorrhagic stroke must be definitively excluded
  - The patient must present within 3 hours of a stroke event
  - The patients age and past medical history
  - Are there any contraindications to the drug administration (see the following link for more information; <http://www.medicines.org.uk/emc/document.aspx?documentId=308>)
- Nasogastric tubes and other invasive devices are not placed within the first 24hours post thrombolysis due to the increased risk of bleeding secondary to trauma.

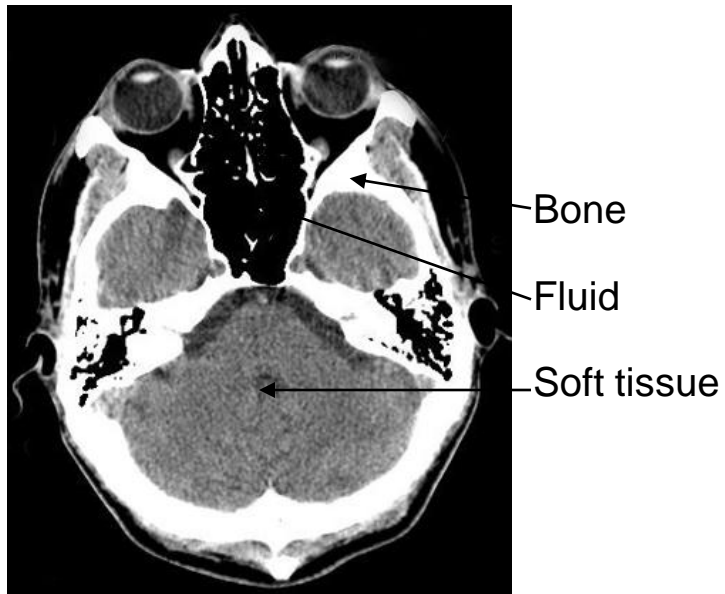
## INVESTIGATIONS

- **CT (computerised tomography) scan**
  - A detailed X ray of the brain which indicates the location of the stroke and identifies the presence of a haemorrhage (used in an emergency setting as it is quicker than a MRI)
  - Can be carried out with contrast to identify the blood vessels in brain and neck and is then know as a CT angiogram
- **MRI (magnetic resonance imaging) scan**
  - A more detailed scan of the brain which is used when more information on location and extent of damage is needed.
  - Can be carried out with contrast to identify the blood vessels in brain and neck and is then known as a MR angiogram
- **Carotid Doppler ultrasound scan (often referred to as a doppler)**
  - It is a ultrasound of the carotid arteries and looks at the flow of blood into the brain. The results are described as X% stenosis (blockage). It gives the medics an indication of whether a CEA is needed
- **CEA (carotid endarectomy)**
  - A vascular surgical procedure which removes artheromas from the carotid artery
- **Echocardiogram (often referred to as an echo)**
  - To assess cardiac function and rule out a cardiac source to the stroke

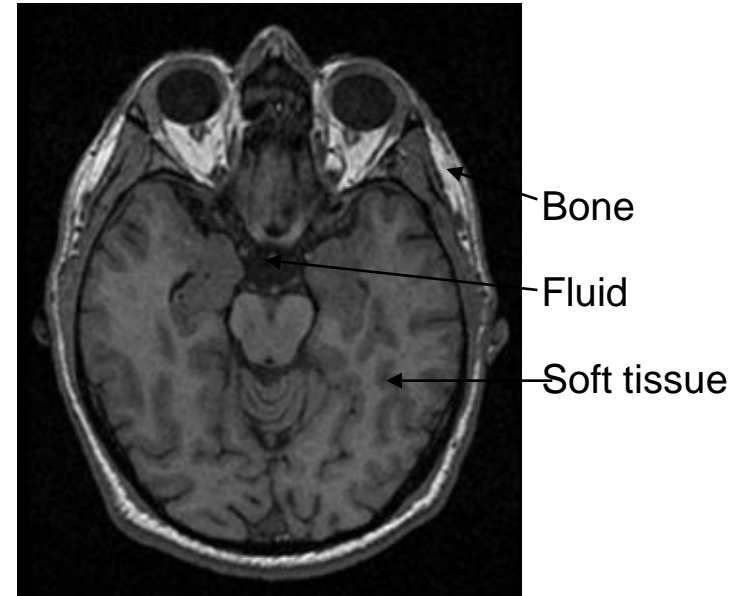
## SCANS

Below is an image of a normal CT scan and an MRI scan.

**CT scan:**



**MRI scan:**

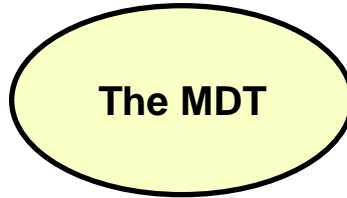


## COMMON MEDICATIONS USED IN STROKE CARE

Drug name	Main use	Dietetic implications
<b>Statins</b>	Cholesterol lowering	Simvastatin & lovastatin: Avoid grapefruit juice Atorvastatin: Limit grapefruit juice intake (occasional glass) or avoid
<b>Fibrates</b>	Triglyceride lowering (with some cholesterol lowering effect)	
<b>Ezetimibe</b>	Cholesterol lowering :Inhibits intestinal absorption of cholesterol	Licensed as an adjunct to dietary measures
<b>ACE inhibitor e.g. Ramipril or Lisinopril</b>	Blood pressure lowering : vasodilator	
<b>Angiotensin-II receptor blockers e.g. Candesartan</b>	Blood pressure lowering : vasodilator	
<b>Beta-blockers e.g. bisoprolol</b>	Blood pressure lowering: reduces the affect of stress hormones including adrenaline Heart rate control (slows it down)	
<b>Dihydropyridine calcium-channel blockers e.g. amlodipine</b>	Lower blood pressure: vasodilator	
<b>Diuretics: Furosemide,bendroflumethiazide Spironolactone</b>	Lower blood pressure: promotes water & salt (+ electrolytes) excretion Potassium sparing	
<b>Antiplatelet: Aspirin , dipyridamole, clopidogrel</b>	Inhibits clot formation in arteries (by reducing platelet aggregation)	
<b>Anticoagulant : e.g. warfarin, dalteparin</b>	Thins the blood	
<b>Alteplase</b>	Breaks up clots	

**THE MULTIDISCIPLINARY TEAM**

**TASK 1:** Fill in the members of the MDT:

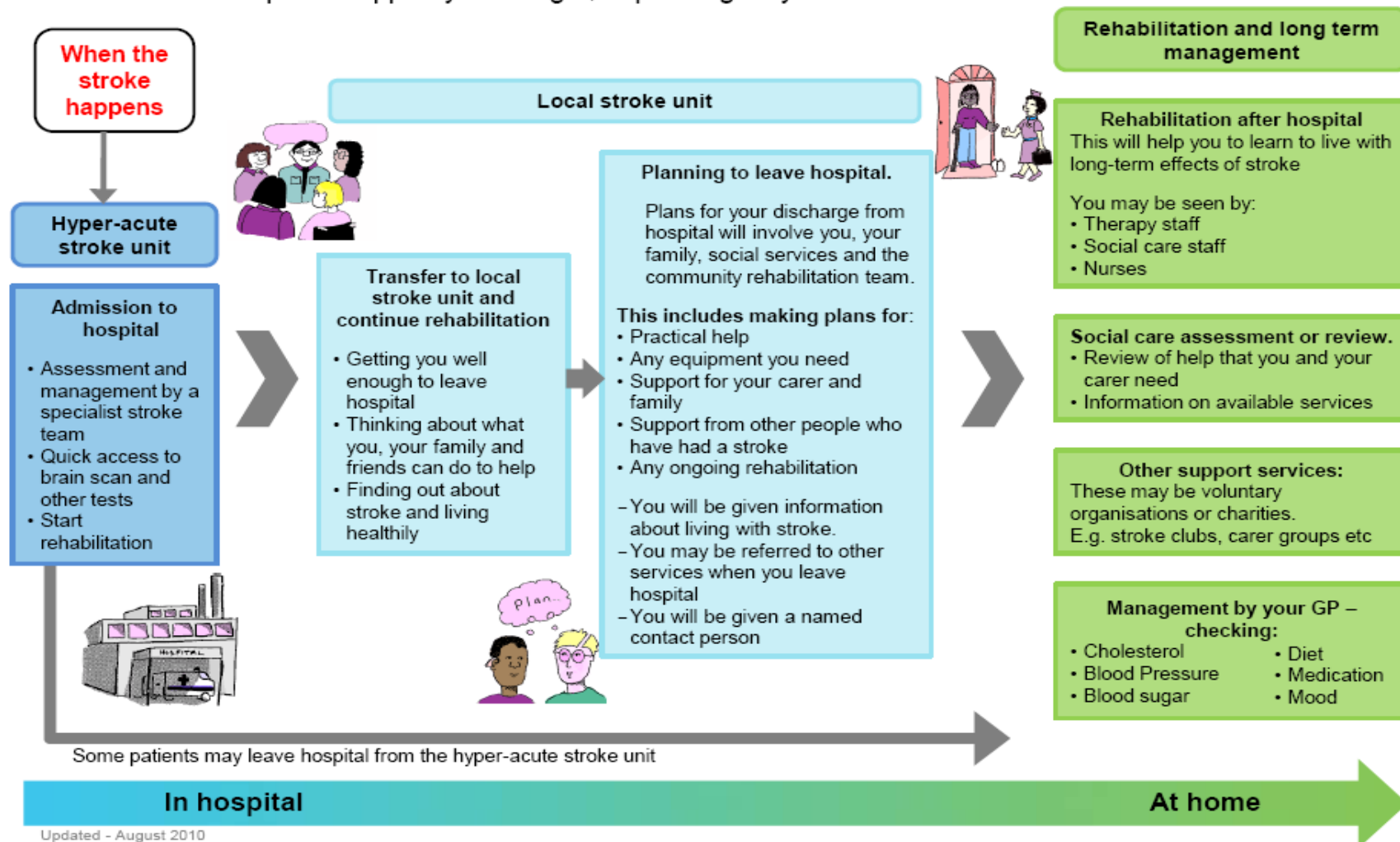


During your time on the Acute Stroke Unit arrange a joint session with a SALT and one other member of the MDT and give three examples of how a dietitian would work with each professional:

<p>Date: _____ MDT member: _____</p> <p>Main learning points:</p>	<p>Date: _____ MDT member: _____</p> <p>Main learning points:</p>
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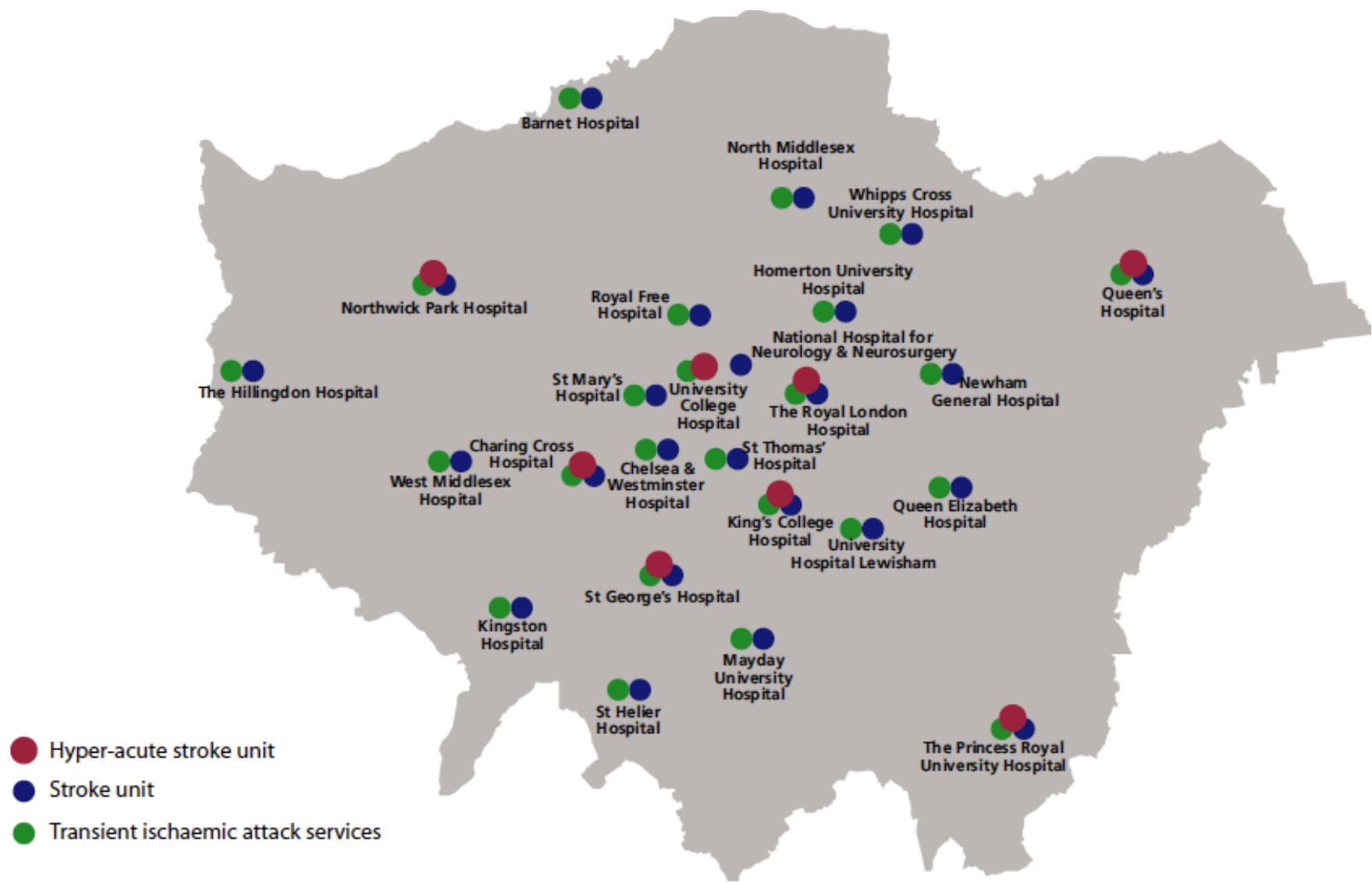
## Stroke Pathway

This is to help you understand what may happen to you after you have had a stroke. It also tells you what kind of help and support you can get, depending on your needs



## London HASU AND ASU MAP

South London  
Cardiac and Stroke Network





## NUTRITION AND STROKE

Stroke is a devastating event which can result in significant cognitive and physical deficits. Each year over 130,000 people in England and Wales have a stroke of which a significant proportion are elderly (Stroke association 2011). The incidence of malnutrition following a stroke varies from 6.1%-62% (Foley 2008) with no universal definition of malnutrition for stroke patients. Undernutrition for this population group is associated with poor outcome. It is compounded by pre-existing malnutrition, difficulties with eating and drinking. It is critical for the recovery of these patients to implement the most appropriate nutritional intervention to prevent malnutrition and improve functional outcomes including activities of daily living. The most common nutritional interventions and dietary modifications used in stroke patients are:

- Modified consistency diet and fluids as part of dysphagia management
- Oral nutrition support
- Enteral Feeding

## Dysphagia

**What is Dysphagia?:** Difficulty swallowing.

- 64-70% of stroke patients have dysphagia (Martino et al 2005)
- 64-90% (National clinical guidelines for stroke 2004)
- 22-42% of stroke patients seen to aspirate on videofluoroscopy (National clinical guidelines for stroke 2004)
- Swallow recovers in >80% within 2-4 weeks (Smithard et al 1997)

### The Normal Swallow

#### Oral Stage:

Keeping the food/fluid in the mouth, forming a cohesive bolus, moving it to the back of the mouth in preparation to swallow

#### Pharyngeal Stage

The trigger of the swallow, protection of the airway and opening into the oesophagus (elevation of the larynx leads to opening of the cricopharyngeal sphincter at the top of the oesophagus)

#### Oesophageal Stage

Food/fluid passing to the stomach via peristalsis

### The Disordered Swallow. What you might see..

#### Oral Stage:

##### **Poor lip closure**

Drooling

Inability to take food from a fork

Leakage of food/fluid from the mouth whilst chewing/drink

##### **Poor tongue movement may lead to:**

Inability to form a food bolus or control liquid

Inability to propel food/drink to the back of the mouth ready for swallowing

Food falling and pocketing in the cheeks and unable to clear it out

##### **Other problems affecting the oral stage:**

Reduced sensation: patient can't feel the food in the mouth and is at risk of biting the cheek or lip without realising

Reduced tone in facial muscles : will result in food pocketing in the affected side, also harder for dentures to stay secure in the mouth

#### Pharyngeal Stage

**Swallowing reflex:** may be delayed to trigger or absent. The bolus will then fall into the pharynx and then into the unprotected airway

**Laryngeal elevation and vocal cord closure:** may be absent, or incomplete leaving the airway unprotected, increasing the risk of aspiration

**Pharyngeal muscles:** weakness may lead to food &/or fluid being left behind after the swallow and subsequently falling into an unprotected airway after the swallow

## Aspiration

The aim of managing dysphagia is to reduce/minimise the risk of aspiration and therefore avoid the complications that occur with aspiration pneumonia

### ASPIRATION IS:

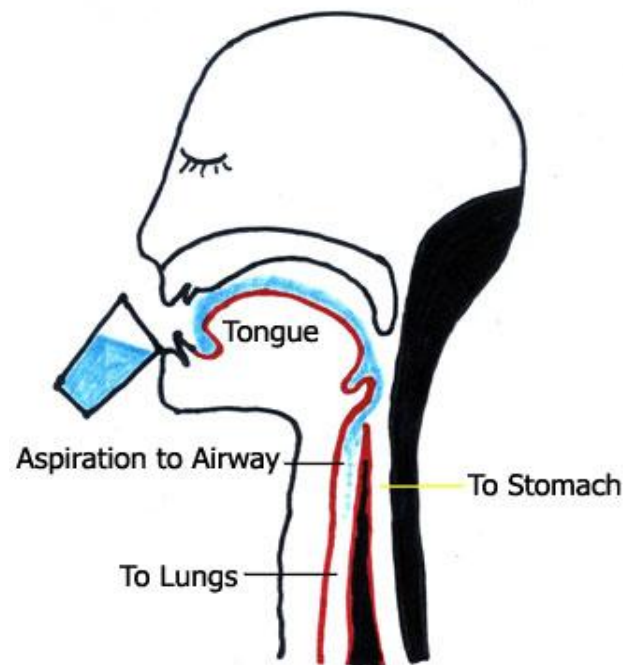
Food or fluid entering the airway below the level of the vocal cords

#### Acute signs (immediately following oral feeding)

- Coughing and choking
- Change of colour
- Sounds of respiratory difficulty – wheezing or gurgling
- Wet sounding/ gurgly voice
- Rapid respiratory rate

#### Chronic signs

- Weight loss – unintentional
- Hunger
- Recurrent chest infections
- Frequent coughing/choking
- Avoidance of food &/or drink



## Management of Dysphagia

**Thickened fluids:**

Stage 1 (Syrup)  
Stage 2 (Custard)  
Stage 3 (Pudding)

} Used when oral control is poor  
and/or there is a delay in the  
trigger of the swallow

**NBM**

When there is a high risk of  
aspiration on ANY oral intake

**Modified Diet**

Puree: (C)  
Soft fork mashable (D)  
Normal Diet

} usually used when a  
patient has difficulty in the oral stage

**STRATEGIES**

Used when there are different postures  
that can reduce or minimise the risk of  
aspiration

**Videofluoroscopy**

Continuous video x-ray (modified barium swallow).  
Patient is given liquid barium to swallow in various  
consistencies to assess the anatomical and  
physiological function of the swallow. Aspiration  
can be detected during this study.

**Oral Trials**

It is possible to have both oral intake and enteral  
feeding. The aim of this intervention is to maintain  
the patients nutritional status whilst minimising the  
risk of aspiration secondary to weakness/fatigue.

**FEES:** Fiberoptic endoscopic evaluation of the Swallow. A flexible  
nasendoscope is used to visualise the pharynx whilst the patient is  
given food and fluids to swallow.

## Mental Capacity, Communication and Dysphagia

- After a Stroke a patient may not be able to communicate their wishes regarding non-oral feeding due to acquired communication and/or cognitive impairment
- It is important to be aware of the patients ability to make a decision as to whether they accept non-oral feeding and that all attempts have been made to enable the patient to consent to the procedure, particularly for long-term non-oral feeding ( i.e. PEG)
- It is important that all information regarding the non-oral feeding or modified diets or about nutrition in general is made accessible to the patient. This may mean simplifying the information or using picture formats

### Who to involve?

The Speech Therapist and/or the psychologist and the family or those who know the person best.

## MENTAL CAPACITY/ADVOCACY

### Mental Capacity Act

Applies to all adults over the age of 16 The Mental Capacity Act (2005) provides a statutory framework to empower and protect vulnerable people who are not able to make their own decisions. It makes it clear who can take decisions, in which situations, and how they should go about this. It enables people to plan ahead for a time when they may lose capacity. The Act replaces previous statutory schemes for Enduring Powers of Attorney and Court of Protection Receivers with reformed and updated schemes.

### Assessing Mental Capacity

- The Act sets out a single clear test for assessing whether a person lacks capacity to take a particular decision at a particular time.
- It is a 'decision-specific' test. No one can be labelled 'incapable' as a result of a particular medical condition or diagnosis.
- A lack of capacity cannot be established merely by reference to a person's age, appearance, or any condition or aspect of a person's behaviour which might lead others to make unjustified assumptions about capacity.
- To test if the person has capacity:
  - Does the person have an impairment of the mind or brain, or a disturbance of mental function?
  - If so does that impairment or disturbance mean that the person is unable to make the decision in question at the time it needs to be made?
- To have capacity to make a decision someone must be able to:
  - Understand the information relevant to the decision.
  - Retain the information.
  - Use that information as part of the process of making the decision.
  - Communicate his/her decision either by talking, signing, or any other means.

## MODIFIED CONSISTENCY DIETS

**TASK 2** : Order a puree meal from catering and comment on the following

1. Appearance:

2. Taste and texture:

3. What is the nutritional content (Kcal/ protein)?

4. Any other comments:

## TASK 3: MODIFIED FLUIDS

CONSISTENCY (DESCRIPTION)	QUANTITY OF THICKENER REQUIRED? (D/W SALT)	THICKEN THE FOLLOWING DRINKS TO TO CORRESPONDING CONSISTENCY	TASTE AND COMMENT.
<b>Stage 1</b> :Syrup •Can be drunk through straw. •Leaves a thin coat on the back of a spoon.		Supplement e.g. Fortisip compact, Fortijuice	
<b>Stage 2:</b> Custard •Cannot be drunk through a straw. •Leaves a thick coat on the back of a spoon.		Water Squash Milk	
<b>Stage 3:</b> Pudding/ Semi solid •Needs to be taken with a spoon.		Tea/ Coffee	



## TASK 4: PATIENT OBSERVATION AT MEAL TIME

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What affects the patients oral intake?

What helps to increase the patients oral intake?

What aids are available to assist people with intake? (Discuss with OT)

## TASK 5: OBSERVE A VIDEOFLUROSCOPY OR DISCUSS PROCEDURE WITH A SALT

Write a short reflective piece including the purpose of the investigation and patient experience.

## ENTERAL FEEDING IN STROKE PATIENTS

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Name the most common methods of artificial feeding used for this patient group

What considerations determine which method is most appropriate?

List at least 4 advantages/disadvantages of each method

## ENTERAL FEEDING IN STROKE PATIENTS

What are some of the common complications of enteral feeding and their causes?

Name three interventions that could be considered with patients who persistently remove NG tubes.

## TASK 6

Observe a nasogastric tube being placed in a patient and write a short reflective piece to include patient experience, ease and confirmation of correct placement.

## ENTERAL FEEDING IN STROKE PATIENTS

### TASK 7

Observe a PEG tube being placed in endoscopy and write a short reflective piece to include patient experience, risks and contra-indications.

## COMMUNICATION

Communication problems are one of the most common effects of stroke. Losing the ability to speak or understand is frightening and frustrating, and it happens to about a third of people who have had a stroke. Reading and writing may also be affected.

The most common communication related conditions related to stroke are:

- » Aphasia (sometimes called dysphasia)
- » Dysarthria
- » Dyspraxia

(Stroke Association 2011)

For more information on the above conditions see the following section on aphasia/dysphasia, the glossary of this workbook and the stroke association website; [www.stroke.org.uk](http://www.stroke.org.uk)

## Aphasia (sometimes called dysphasia) and Dysarthria

### Aphasia

- This is a term used to describe a disorder of language which affects a person's ability to understand what is being said, and or to express thoughts in words. It is caused by damage to the language centre of the brain.
- Aphasia can affect all modes of language including speaking, writing, gesture, reading, using numbers and understanding what people say.
- For some people with dysphasia, their main difficulty is in **understanding words and sentences**- Receptive aphasia.
- Some people with aphasia have difficulties with **finding words and putting sentences together**- Expressive aphasia.

### Dysarthria

- This is a term to describe speech that sounds slurred, quiet and dysfluent.
- Is caused by weakness, slow movement and in-coordination of the muscles associated with speech.
- Individuals with dysarthria do not necessarily have language impairment. They know what they want to say and how they want to say it. They understand what is being said to them.
- For stroke patients it may be associated with swallowing difficulties.



## COMMUNICATION

### Task 8

**Talk to a patient with a communication impairment due to their stroke, and answer the following questions:**

1. Before you speak to the patient, what do you need to consider about your own communication style?
2. How has the patient's communication been affected?
3. What term is used to describe the communication impairment?



## Secondary Prevention of Stroke

### Dietary and lifestyle changes to reduce risk of further stroke:

- Lose weight if overweight (BMI > 25)
- Consume at least 5 portions of fruit and vegetables daily
- Reduce salt consumption
- Eat regular well balanced meals
- Reduce saturated fats and replace with mono and polyunsaturated fats.
- Include 2 portions oily fish per week
- Keep within safe alcohol limits as recommended by the DOH
- Engage in regular physical activity as tolerated

## GLOSSARY

**A**

ASU	Acute Stroke Unit
Agraphia	Inability to write.
Alexia	Inability to read
Aphasia (sometimes called dysphasia)	The inability to use language. It can either be a problem understanding language (receptive) or speaking it (expressive).
Apraxia	Loss of ability to do well practiced tasks (e.g. dressing).
Ataxia	Lack of coordination, unsteadiness.

**C**

Cerebellum	The part of the brain at the back which is responsible for coordinating voluntary muscle movement.
Cerebral Haemorrhage	Bleeding into the brain tissue (intracerebral haemorrhage) or into surrounding areas (subarachnoid haemorrhage)
Cerebral Infarct	Blood supply to a part of the brain has been disturbed resulting in an area of brain dying. This area is referred to as the infarct. Cerebral refers to the brain
Contralateral	The opposite side of the body.

**D**

Duplex carotid scan	An ultrasound scan of the carotid arteries in the neck (also termed carotid Doppler).
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## GLOSSARY

**D**

Dysarthria	A motor disorder of the tongue, mouth, jaw or voice box resulting in slurred speech
Duplex carotid scan	An ultrasound scan of the carotid arteries in the neck (also termed Carotid Doppler).
Dysarthria	A motor disorder of the tongue, mouth, jaw or voice box resulting in slurred speech.
Dyslexia	Difficulty reading.
Dysphagia	Difficulty swallowing.
Dysphasia	See Aphasia
Dysphonia	Impairment of the voice.
Dyspraxia	Difficulty with performing skilled or purposeful voluntary movement even though the person is physically able to do it.

**E**

Echocardiogram	Ultrasound scan of the heart.
Electrocardiogram	A test that measures electrical activity (ECG) and rhythm of the heart.
Electroencephalogram	A test used to record electrical activity (EEG) in the brain by placing electrodes on the scalp.

**G**

Gait	Manner of walking
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## GLOSSARY

**H**

HASU	Hyper-Acute Stroke Unit
Hemianaesthesia	Loss of sensation down one side of the body.
Hemianopia	Loss of the field of vision in each eye.
Hemi-inattention	Ignoring space on the side of the body, sometimes called unilateral neglect.
Hemiparesis	Weakness of one-half of the body.
Hemiplegia	Complete paralysis of half of the body.
Homonymous hemianopia	Loss of vision that effects the nasal half of the field of vision of one eye and the temporal half of the other.
Hydrocephalus	Raised pressure within the skull caused by excess fluid on the brain.

**L**

Lacunar stroke	A small stroke less than 1.5cm in diameter when measured on the brain scan.
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**M**

Middle cerebral artery	The artery that most frequently becomes blocked, to cause stroke.
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## GLOSSARY

**N**

Neglect, one sided

A term sometimes used for lack of awareness of one side of the body.

Neuroplasticity

After stroke, dead brain cannot regrow. Unaffected brain tissue that surrounds the dead area takes over part of the lost function. The process is called neuroplasticity.

**P**

Paraesthesia

An abnormal sensation, such as of burning, pricking, tickling, or tingling.

Paraphrasia

Producing unintended phrases, words or syllables during speech.

Paresis

Muscle weakness.

PEG

Percutaneous endoscopic gastrostomy feeding tube inserted through the abdominal wall into the stomach.

**S**

SALT

Speech and Language Therapist

Subarachnoid

Bleeding between the brain pial surface and the covering membranes, often caused by a ruptured aneurysm.

## GLOSSARY

**T**

Thalamus (thalamic)

A part of the brain where the nerves carrying information about sensation from the body join with other nerves.

Thromboembolic

A blood clot which was embolised

Thrombolysis

The use of drugs to break up a blood clot.

TIA

Transient ischaemic attack – a short lived mini stroke that lasts from a few minutes up to 24 hours.

**V**

Videofluoroscopy

A video X-ray of the swallowing mechanism.