Role of the nurse in stroke rehabilitation

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Abstract
Stroke is a leading cause of death and adult disability in the UK. A stroke can have significant negative effects on the lives of patients and their families and carers. While improved stroke management has contributed to a reduction in mortality and improved outcomes following rehabilitation, the incidence of stroke continues to rise in the UK, partly because of the ageing population. Stroke rehabilitation involves a multidisciplinary approach, with nurses performing a central role. This article describes the risk factors and types of stroke, the main areas of stroke rehabilitation and the role of the nurse. It emphasises that providing support to families and carers is a particularly important element of caring for people who have experienced a stroke.

Aims and intended learning outcomes
The aim of this article is to provide information about stroke for nurses who may not regularly care for patients who have experienced a stroke, and for those about to undertake a role in this area. After reading this article and completing the time out activities you should be able to:

- Define the main classifications of stroke.
- Outline the causes and primary risk factors for stroke.
- Identify the primary guidance in stroke care and rehabilitation.
- Discuss the important elements of nursing care in the rehabilitation of people who have experienced a stroke.
- Explain the main areas of stroke prevention.

Introduction
The World Health Organization (1978) defined the term ‘stroke’ as a clinical syndrome involving rapidly developing focal (affecting a specific area of the body such as the left arm) or global neurological deficits of presumed vascular origin, lasting for 24 hours or more. Transient ischaemic attacks (TIAs), also known as mini-strokes, are defined as an acute loss of focal neurological function lasting less than 24 hours, and, following a TIA, patients have a high risk of stroke for up to one year (Hankey and Warlow 1994). Stroke is the third leading cause of death and a leading cause of adult-acquired disability in the UK (Newton et al 2015, Office for National Statistics 2017), and a leading global cause of death and acquired disability (Feigin et al 2017).

A guideline for stroke care has been developed by the Intercollegiate Stroke Working Party in the UK and published by the Royal College of Physicians (RCP) (2016). This guideline provides comprehensive, evidence-based guidance on all aspects of stroke care in combination with guidance from the National Institute for Health and Care Excellence (NICE) (2013, 2017a). Prompt initial management, timely admission to hospital, and coordinated multidisciplinary care and rehabilitation, will result in optimal outcomes for a patient experiencing a stroke.

Causes and risk factors
Stroke occurs when the blood supply to the brain is interrupted, leading to death of brain tissue (Markus 2016). Ischaemic strokes are caused when a thrombus or embolus blocks the cerebral arteries, which impedes the passage of oxygen and nutrients, and results in brain tissue death.

Why you should read this article:
- To assist you to provide effective, holistic nursing care to patients who have had a stroke, as well as their families and carers
- To understand the causes and risk factors for stroke, and implement effective stroke prevention strategies
- To count towards revalidation as part of your 35 hours of CPD, or you may wish to write a reflective account (UK readers)
- To contribute towards your professional development and local registration renewal requirements (non-UK readers)
The impairments associated with stroke can be varied and it can take months or even years of rehabilitation for an individual to return to their normal functioning, if at all. Impairments can include swallowing difficulties (dysphagia) and pain, hemiplegia (unilateral weakness), speech and communication difficulties, and extreme tiredness known as post-stroke fatigue (Cross 2008).

Patients who have experienced a stroke should initially receive 45 minutes of therapy at least five days per week from each of the relevant therapy teams, such as physiotherapy, occupational therapy, and speech and language therapy, to work on areas such as mobilisation, cognition, speech and communication, and swallowing (NICE 2013). Patients should also be actively involved in the rehabilitation process.

It is important for the nurse to set realistic targets for recovery and, working in partnership with the patient, to achieve those targets through a self-management approach (NICE 2013). A patient’s rehabilitation can change over time as the challenges of living with stroke-acquired impairments are revealed. Structured health and social care reviews should take place annually after the patient’s initial discharge from inpatient services to evaluate whether further intervention or referral to specialist assessment is required (RCP 2016).

Rehabilitation can take place in the patient’s home, where it can be more appropriate and cost-effective than in an inpatient setting (Department of Health 2010). Early supported discharge is a community-based intervention run by specialist stroke teams, including physiotherapists, occupational therapists, and speech and language therapists. These interventions are often nurse-led and enable care to be transferred from an inpatient setting to the community. This service provides rehabilitation therapy in the patient’s home at the same intensity as expected in the inpatient setting, with the advantage of reducing length of hospital stay and the institutionalisation of patients (NICE 2013). However, only 35% of those discharged home have access to this support in the
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Nursing rehabilitation

Continence care

Incontinence of the bladder and/or bowel is common during the acute stroke phase and can persist in up to one quarter of patients one year following a stroke, while constipation can develop in more than half of patients who have had a stroke during the acute phase (Lim and Childs 2013, Mehdi et al 2013). Incontinence increases the risk of skin breakdown, and can complicate the healing of pressure ulcers or moisture lesions. It can also have a detrimental effect on the psychological well-being of individuals in areas including self-image, confidence and engagement in rehabilitation (Woodward 2014).

There is no one cause of post-stroke incontinence, and routine urethral catheterisation should be avoided unless indicated for urinary retention or critical fluid balance measurement. Nurses should be educated in the use of standardised assessment and management techniques for both incontinence and constipation, for example bladder diaries, pelvic floor muscle training and regular toileting schedules (Lim and Childs 2013, Mehdi et al 2013). If there is a continued loss of bladder and/or bowel control after two weeks of initial management, a full reassessment should take place. Care plans should be discussed with the patient and include: treatment of any identifiable cause of incontinence; training in management of incontinence; arrangement for continued supply of continence aids such as pads; and specialist referrals, where appropriate (Mehdi et al 2013, Woodward 2014). Lim and Childs (2013) identified that a structured, nurse-led bowel management programme may be effective for those with constipation. This can be undertaken by any competent nurse and includes advice on diet, fluid intake, exercise and routine toileting to encourage regular bowel movement.

Dysphagia, nutrition and hydration

Early identification and management of nutrition and hydration issues are vital in post-stroke rehabilitation. Challenges in providing adequate nutrition, weight maintenance and swallowing can persist for months following a stroke and must be reviewed regularly.

Dysphagia is a common complication of stroke that can have significant consequences if not managed appropriately. Between 40% and 78% of patients will present with some form of dysphagia after a stroke, and while many of these patients will make a full recovery, some will be left with permanent swallowing difficulties (Foley et al 2008, Vose et al 2014, RCP 2016). Dysphagia has been linked to suboptimal outcomes such as aspiration pneumonia and respiratory difficulties, longer hospital stays, chest infection and death; therefore, early identification and effective management is essential in stroke care (Roth et al 2001). While speech and language therapists will be responsible for regular assessment of patients with dysphagia, including providing guidance on interventions such as textured food and fluids, they will rely on nurses to undertake day-to-day care and report any new swallowing difficulties (Smithard 2016).

On admission to hospital, patients should be screened for risk of malnutrition and receive weekly reviews thereafter using a validated tool (NICE 2017b), such as the Malnutrition Universal Screening Tool (British Association for Parenteral and Enteral Nutrition 2018). Patients should also be screened for dysphagia within four hours of admission using a validated screening tool such as the Gugging Swallowing Screen (Trapl et al 2007) before any food and/or drink is given or medicines are administered (RCP 2016). Nurses should educate patients on the need to avoid eating and drinking until they have been assessed and had initial dysphagia screening undertaken by a suitably trained nurse.

Patients who are unable to swallow safely are at risk of pulmonary aspiration and should be considered for an alternative feeding method such as nasogastric tube feeding within 24 hours of experiencing a stroke, with referral to a dietitian for a full assessment of any feeding prescriptions (Vose et al 2014, NICE 2017b). Nurses are responsible for insertion and ongoing care of nasogastric tubes, feeding and medicines administration. All patients at risk of malnutrition, regardless of the feeding method, should be offered nutritional support, including referral to a dietitian if required.

Oral hygiene

Suboptimal oral care is linked to ulceration, soreness and cracked lips in patients who have experienced...
A stroke. Suboptimal oral care can also lead to the development of bacteria, increasing the risk of aspiration pneumonia, especially for patients with dysphagia (Brady et al 2006, Sørensen et al 2013). The discomfort resulting from suboptimal oral care means that patients are less likely to eat and achieve adequate nutrition (Foley et al 2008). Optimal oral hygiene includes the cleaning and brushing of teeth and gums, removal of excess secretions, and application of lip balm. Nurses should undertake oral hygiene for patients who have experienced a stroke, or provide guidance on self-care for those who are able to undertake this independently. Oral hygiene interventions should be administered at least three times per day (RCP 2016).

**TIME OUT 3**
Consider the role of venous thromboembolism in stroke. How does venous thromboembolism relate to immobility and what potential treatments are available? Discuss with your colleagues whether these treatments are available in your area of practice.

Positioning, mobilisation and falls

Following a stroke, patients can be left with varying levels of physical impairment and are at increased risk of developing pressure ulcers, limb swelling, contractures, joint pain and injuries. These factors can significantly increase recovery time, reduce the amount of physiotherapy patients can undertake, and become a negative influence on patients’ mood and well-being (AVERT Trial Collaboration group 2015).

Suboptimal positioning during feeding can lead to aspiration pneumonia, especially for those with dysphagia, and general suboptimal positioning also increases the risk of respiratory infections. Hemiplegic shoulder pain, involving paralysis and suboptimal recovery of arm movement, which affects as many as one quarter of patients following a stroke, is often caused by suboptimal positioning (Smith 2012). The focus of treatment is on encouraging patients to mobilise as soon as possible to reduce the risks associated with extended periods of immobility, restore functionality, and improve rehabilitation outcomes and independence (AVERT Trial Collaboration group 2015).

Patients should be assessed within 24 hours of experiencing a stroke by an appropriately trained healthcare professional to determine the safest and most appropriate means of transfer and mobilisation, for example their ability to move from a bed to a chair or toilet (RCP 2016). This is a role often undertaken by physiotherapists in conjunction with nurses. During the moving and handling of patients who have experienced a stroke, nurses should ensure that safe techniques such as the use of slide boards and hoists are used, and that appropriate support is provided for individuals with weakened limbs to reduce the incidence of pain and subluxation (incomplete or partial dislocation of a joint) (Smith 2012). Positioning should also support optimal respiratory function to minimise the risk of respiratory infections, for example the patient should be positioned upright and supported by pillows to enable optimal lung expansion (RCP 2016). Patients, especially those with dysphagia, should be assisted into the appropriate position for feeding, either orally or enterally, to reduce the risk of aspiration (Vose et al 2014).

The rehabilitation process should include ongoing assessment and management of falls. Patients who have limited mobility associated with stroke have an increased risk of falls, with up to 73% likely to experience a fall (Sackley et al 2008). Fear of falls, either from healthcare staff or patients, should not be a barrier to mobilisation, and effective rehabilitation and short frequent periods of mobilisation should be provided daily (AVERT Trial Collaboration group 2015). Patients who are sufficiently mobile should be encouraged to transfer themselves to the bathroom, which can assist in resolving incontinence (Woodward 2014).

Venous thromboembolism

Deep vein thrombosis (DVT) and pulmonary embolism are recognised complications of immobility, and patients who have been left immobile as a result of a stroke are at high risk of these conditions. However, the risk of a symptomatic intracranial bleed after an ischaemic stroke outweighs the benefits of prophylactic treatment of venous thromboembolisms by low-molecular-weight heparin, and anticoagulation therapy can worsen an existing haemorrhagic stroke (Geeganage et al 2013). The CLOTS (Clots in Legs Or Stockings after Stroke) Trials Collaboration (2014) demonstrated that compression stockings were ineffective at preventing DVT in patients who had experienced a stroke, while intermittent pneumatic compression (a technique that provides mechanical compression, for example by using an air pump) was effective in reducing the incidence of DVT and improving survival rates. Therefore, it is advised that intermittent pneumatic compression should be commenced within three days of admission to hospital for immobile patients and be continued for 30 days or until the patient is mobile and discharged, whichever is sooner (RCP 2016).

Should a patient who has experienced an ischaemic stroke develop a DVT, the guidance advises that anticoagulation therapy should be commenced because of the risks associated with pulmonary embolism (RCP 2016). No evidence exists to guide management of DVT in intracerebral haemorrhage, therefore individual healthcare professionals should undertake their own risk-benefit assessment.

**Psychological services**

Mood disturbances are common following a stroke, with up to one third of patients experiencing depression and one fifth of patients experiencing emotionalism (an increase in emotional behaviour with minimal stimulus) (Hackett et al 2010, NHS Improvement 2011, Mitchell 2015). Patients who have experienced a stroke are also at risk of anxiety and nurses should undertake an initial mood screening assessment, which may include questions about the patient’s age, cognitive ability and whether they have experienced any suicidal ideation (Kneebone et al 2010).

Nurses should adopt a multimodal approach to mood disturbances that includes brief...
interventions and motivational interviewing. These are patient-centred counselling approaches that use non-judgemental open questions and reflective listening (Hackett et al 2008, Mitchell 2015). Nurses are also well-placed to provide straightforward information and advice, support patients to engage socially, and assist them to undertake exercise and physiotherapy. Nurses should ensure that they report any concerns, such as patients who are not engaged with exercise programmes, to the multidisciplinary team so that these individuals’ care can be reviewed (Healthcare Quality Improvement Partnership 2017).

**TIME OUT 4**
Take time to consult with various members of the multidisciplinary team involved in stroke rehabilitation in your healthcare organisation. Enquire about their methods for assessing patients, how they set targets for individual patients, and how they involve families and carers.

**Pain management**
Up to 46% of patients who have experienced a stroke report post-stroke pain, which can take the form of musculoskeletal pain or neuropathic pain, and can have a negative effect on rehabilitation and quality of life (Hansen et al 2012). Central post-stroke pain (CPSP) is a form of chronic neuropathic pain that develops following damage to neural tissue. CPSP is estimated to affect 5-20% of patients, with little research to demonstrate a universal approach for effective pain relief, given its resistance to conventional analgesia (Oh and Seo 2015). Nurses have a pivotal role in: informing patients about the nature of CPSP and how it can affect quality of life; explaining the aims of its management; exploring pain relief methods; and supporting them to develop an individual plan for pain management (Oh and Seo 2015). Prolonged immobility, suboptimal posture, and inappropriate moving and handling techniques can cause musculoskeletal pain, as well as exacerbating pre-existing conditions (Hansen et al 2012).

**TIME OUT 5**
Sexual health can be a sensitive issue for patients and nurses. Consider how this issue is discussed in your practice area with patients who have experienced a stroke, and whether the subject is being adequately addressed. For example, are patients directed to local sexual health services?

**Sexual health**
Sexual dysfunction is not uncommon following a stroke and can develop because of a combination of factors, for example altered sensation, side effects of drug therapy and immobility, as well as changes in mood and self-identity (Stein et al 2013). The partners of patients who have had a stroke may also report sexual dysfunction, including feeling unable to discuss sexuality and being unwilling to engage in sexual activity, in some cases for fear of causing further harm to their partner (Korpelainen et al 1999). Reluctance among nurses to discuss sexual relationships can also be a factor in patients not wanting to discuss their sexual health following a stroke (Bates 2011). Nurses should be prepared to discuss sexual health with patients who have experienced a stroke soon after discharge or during regular subsequent reviews. Box 2 provides some guidance for discussing sexual health with patients.

**Tracheostomy care**
A tracheostomy is a surgical procedure that forms an airway through an incision in the trachea (Myatt 2015). An estimated 1-3% of patients who have experienced a stroke will require a tracheostomy (Seo et al 2017). While a tracheostomy is reversible, a patient who has experienced a stroke may require one for an extended period of their rehabilitation, and it may ultimately be permanent (Myatt 2015, Seo et al 2017). Tracheostomies are used either for maintaining airway and breathing during the acute phase of a stroke, or in severe ongoing dysphagia where repeated aspiration significantly affects the patient’s rehabilitation (Bösel 2014, Seo et al 2017).

Nursing care of a patient with a tracheostomy includes (Myatt 2015):

* Assessment of their swallowing and respiratory function.
* Assessment of their ability to clean and maintain the tracheostomy site and inner cannula, including changing the inner tube.
* Undertaking endotracheal suctioning and oral care.
* Supporting their communication needs. Nurses can educate patients with a tracheostomy on how to undertake self-care where it is safe and viable to do so, further promoting independence. Suboptimal management of a tracheostomy can have serious and even fatal consequences; therefore, healthcare organisations should have established protocols for the daily care of patients with a tracheostomy and should provide relevant training (National Confidential Enquiry into Patient Outcome and Death 2014).

**Supporting carers**
As well as caring for patients who have experienced a stroke, it is important for nurses to remember that holistic care also includes family members and carers. Carers can include formal paid carers as well as the patient’s partners, friends and family members. The sudden, unexpected nature of stroke can place partners, friends and family members into a carer role with

**BOX 2. Discussing sexual health with patients**

* Consider patients’ sexual health needs as part of a holistic approach to care
* Be aware of your own assumptions, beliefs and values about sexual health
* Use neutral language such as ‘your partner’, rather than terms such as ‘husband’ or ‘girlfriend’
* Consider using the Extended-PLISSIT model (Taylor and Davis 2006) to promote discussions about sexual health with patients. This is a framework used to explore the sexual health of patients, and describes four levels of intervention that healthcare practitioners can provide: Permission-giving; Limited Information; Specific Suggestions; and Intensive Therapy, such as psychosexual counselling
* Refer patients to experts such as sexual health nurse specialists, if necessary

(Adapted from Bates 2011)
little warning or support. When discharging patients who have experienced a stroke, nurses should assess the needs of carers separately, identifying areas where they might require practical or emotional support, for example with increased domestic workloads (Bulley et al 2010, Ceci et al 2010). Signposting services such as local care agencies and charities should be a part of this process, as well as referral to stroke units, rehabilitation centres or practice clinics, where necessary.

**TIME OUT 6**

Consider the support services such as charities available for the carers of a patient who has had a stroke in your practice area. Is information about local support services routinely provided during the patient’s discharge, or do carers have to request it?

**Stroke prevention**

Patients who have experienced a stroke or TIA are at significant risk of further stroke events. For example, 26% of patients will have a recurrent stroke within five years of the initial stroke, and 39% of patients will have a recurrent stroke within ten years (Mohan et al 2011). The aim of stroke prevention is to identify modifiable risk factors and, in concordance with the patient, develop an individualised care plan that will reduce the risk of additional stroke events. For example, optimal glycaemic control in diabetes can decrease the risk of stroke.

Optimal practice in stroke prevention should enable patients to self-monitor and manage their risk factors, with only occasional intervention by healthcare professionals. However, some risk factors may require regular contact with healthcare professionals and pharmaceutical intervention, for example atrial fibrillation requires appropriate anticoagulation therapy alongside regular blood testing.

Stroke prevention and health promotion should involve the

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**References**


multidisciplinary team providing support for patients to make lifestyle changes that can reduce mortality and disability should stroke occur (Birns and Bhalla 2015). Nurses have an important role in encouraging patients to undertake self-care in relation to modifiable lifestyle factors such as stress, alcohol consumption, smoking and obesity (Lawrence et al 2011). The aim of lifestyle management in stroke prevention is for nurses to motivate patients to consider the advantages and disadvantages of their lifestyles and, in doing so, modify their health beliefs, attitudes and behaviours (Lawrence et al 2011).

Conclusion
The nurse is an important member of the multidisciplinary team and can contribute to the essential day-to-day care and support for patients who have experienced a stroke, throughout their treatment and rehabilitation. Nurses are responsible for a range of rehabilitation interventions, including pain management, assistance with mobilisation, nutrition and hydration, and continence care. Nurses are also well placed to provide emotional support for patients who are undertaking physical rehabilitation, and can provide specific advice around sexual health and the self-care of tracheostomies.

TIME OUT 7
Consider how the nursing care of patients who have experienced a stroke relates to The Code: Professional Standards of Practice and Behaviour for Nurses and Midwives (Nursing and Midwifery Council 2015) or, for non-UK readers, the requirements of your regulatory body.

TIME OUT 8
Now that you have completed the article, reflect on your practice in this area and consider writing a reflective account: rcni.com/reflective-account
Stroke rehabilitation
TEST YOUR KNOWLEDGE BY COMPLETING THIS MULTIPLE-CHOICE QUIZ

1. Stroke involves:
   a) Rapidly developing focal or global neurological deficits of presumed vascular origin
   b) Gradually developing focal or global cognitive deficits of presumed vascular origin
   c) Rapidly developing focal or global cardiac deficits of presumed vascular origin
   d) Gradually developing focal or global respiratory deficits of presumed vascular origin

2. What is the most common type of stroke?
   a) Intracerebral haemorrhagic
   b) Subarachnoid haemorrhagic
   c) Ischaemic
   d) Transient ischaemic attack (TIA)

3. How long does a TIA or ‘mini-stroke’ last for?
   a) Less than 24 hours
   b) 24-48 hours
   c) 48-72 hours
   d) More than 72 hours

4. Which of the following is a primary risk factor associated with stroke?
   a) Hypertension
   b) Diabetes mellitus
   c) Excess alcohol intake
   d) All of the above

5. Which statement is true?
   a) Stroke rehabilitation is always more appropriate and cost-effective in an inpatient setting than in the patient's home
   b) Stroke rehabilitation focuses on engaging the patient with therapy as early as their clinical condition allows, using a person-centred, multidisciplinary approach to provide the optimal level of functional recovery
   c) A patient's rehabilitation must remain the same over time, no matter what stroke-acquired impairments they have
   d) Patients who have had a stroke will return to their normal level of functioning within six months

6. One advantage of early supported discharge is:
   a) It is available to all patients in the community
   b) It enables care to be transferred from the community to inpatient settings easily
   c) It reduces lengths of hospital stay and the institutionalisation of patients
   d) It focuses on providing emotional support to patients

7. Which of the following is not a potential complication of dysphagia?
   a) Aspiration pneumonia
   b) Atrial fibrillation
   c) Longer hospital stays
   d) Chest infection

8. What is recommended to prevent deep vein thrombosis in patients who have experienced a stroke?
   a) Intermittent pneumatic compression
   b) Anticoagulation therapy
   c) Compression stockings
   d) Hormone replacement therapy

9. As part of the care of a patient with a tracheostomy, nurses should:
   a) Assess their swallowing and respiratory function
   b) Assess their ability to clean the tracheostomy site
   c) Undertake endotracheal suctioning
   d) All of the above

10. What is the aim of lifestyle management in stroke prevention?
    a) To assess the needs of the patient’s family members and carers
    b) To discuss any sexual health issues the patient may be experiencing, and refer them to specialist services where necessary
    c) To motivate patients to consider the advantages and disadvantages of their lifestyles and, in doing so, modify their health beliefs, attitudes and behaviours
    d) To improve patients’ quality of life through enhancing functional ability and increasing social participation

How to complete this quiz
This multiple-choice quiz will help you to test your knowledge. It comprises ten questions that are broadly linked to the CPD article. There is one correct answer to each question.
- You can test your subject knowledge by attempting the questions before reading the article, and then go back over them to see if you would answer any differently.
- You might like to read the article before trying the questions.
Subscribers making use of their RCNi Portfolio can complete this and other quizzes online and save the result automatically. Alternatively, you can cut out this page and add it to your professional portfolio. Don't forget to record the amount of time taken to complete it.

Further multiple-choice quizzes are available at rcn.com/cpd/test-your-knowledge

This multiple-choice quiz was compiled by Jason Beckford-Ball

The answers to this multiple-choice quiz are:
1. a 2. c 3. a 4. d 5. b 6. c 7. b 8. a 9. d 10. c

This activity has taken me __ minutes/hours to complete. Now that I have read this article and completed this assessment, I think my knowledge is:
Excellent □ Good □ Satisfactory □ Unsatisfactory □ Poor □

As a result of this I intend to: ________________________________