**Stroke 3: life after stroke, assessment and rehabilitation**

"My year off began with a headache, a glass of champagne – and a question. First, for reasons which are still mysterious, a surreptitious clot began to form in one of my cerebral arteries, cutting off the blood supply to part of the one organ in the body, next to the heart, which is most greedy for blood.” (McCrum, 2015)

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so starts Robert McCrum’s account of his experience of having a stroke. This article follows his journey to demonstrate the range of therapeutic interventions that can aid recovery from stroke, using extracts from his book about his experience to discuss the key areas of stroke rehabilitation.

**Key points**

- **Developments in technology, such as mapping visualisations of the brain, are changing stroke rehabilitation**
- **After a stroke, the brain actively rebuilds itself, which has implications for rehabilitation**
- **Long-term consequences of stroke include physical disability, cognitive impairment, fatigue, depression and anxiety**
- **Stroke rehabilitation starts with an objective assessment of the person’s function**
- **Stroke rehabilitation requires multidisciplinary involvement and needs to be tailored to the individual’s needs**

**Authors** Peter Jones and Rosetta West are senior lecturers in the department of adult nursing and midwifery at London South Bank University.

**Abstract** Despite advances in the diagnosis and treatment of acute stroke, rehabilitation is still a key part of stroke care, as most patients experience some level of functional deficit. Patients and families will need help with a range of cognitive, physical, psychological and emotional sequelae, sometimes for many years, and their needs will vary greatly. This article - the third in our five-part series on stroke – discusses stroke rehabilitation, covering current guidelines and tools, and emphasises the need for thorough assessment and reassessment. It is built around the autobiography of Robert McCrum, who gives a glimpse into the patient experience.

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- as such, the need for stroke rehabilitation is likely to remain a vital part of stroke care.

Stroke rehabilitation is not a stagnant backwater. Many recent developments in technology, such as mapping visualisations of the brain (Puthenpurakal and Crussell, 2017), provide an enormous impetus to practice development. Once seen as inert, the brain after injury has now been shown to be an active rebuilder of its damaged self. This plasticity (its ability to change) has far-reaching implications for rehabilitation.

**Principles of rehabilitation**

The future functional and physical abilities of patients after a stroke are difficult to predict, as they depend on the type of stroke experienced, how soon treatment was administered, pre-stroke health including comorbidities, and rehabilitation programmes and facilities. A Scottish report suggests that 30% of patients could be fully independent within three weeks of their stroke, rising to nearly 50% within six months (Scottish Intercollegiate Guidelines Network, 2010). However, many patients and their families are left coping with long-term consequences such as physical disability, cognitive impairment, fatigue, depression or anxiety (Crichton et al, 2016; Moorley et al, 2016a). Table 1 shows the most common disabilities after a stroke.

The World Health Organization’s International Classification of Functioning, Disability and Health (bit.ly/WHOClassification) provides a framework for considering the impact of stroke on the individual:

- **Pathology (disease or diagnosis):** operating at organ/organ-system level;
- **Impairment (symptoms and signs):** operating at whole-body level;
- **Activity limitations (disability):** observed behaviour or function;
- **Participation restriction (handicap):** individual’s social position and roles.

This framework shapes how clinicians and others approach the continued management of people requiring stroke rehabilitation.

The National Institute for Health and Care Excellence’s (2013) guidelines for stroke rehabilitation recommend that people who have had a stroke initially be cared for in specialised stroke centres called hyper acute stroke units (HASUs). This may mean patients are cared for farther away from home, but their outcomes may be improved because of the specialist knowledge and experience available. Rehabilitation should start as soon as possible after stroke, even when patients are still in the HASU, depending on their condition.

<table>
<thead>
<tr>
<th>Disability</th>
<th>Incidence (%)</th>
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<tbody>
<tr>
<td>General movement</td>
<td>80</td>
</tr>
<tr>
<td>Arm movement</td>
<td>70</td>
</tr>
<tr>
<td>Inability to use one arm in the long term</td>
<td>40</td>
</tr>
<tr>
<td>Spasticity</td>
<td>19-38</td>
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<tr>
<td>Altered sensation</td>
<td>Up to 80</td>
</tr>
<tr>
<td>Swallowing</td>
<td>40</td>
</tr>
<tr>
<td>Aphasia</td>
<td>33</td>
</tr>
<tr>
<td>Visual problems</td>
<td>Up to 66</td>
</tr>
<tr>
<td>Depression</td>
<td>29</td>
</tr>
<tr>
<td>Emotionalism in first six months</td>
<td>20</td>
</tr>
<tr>
<td>Ongoing emotionalism</td>
<td>10</td>
</tr>
<tr>
<td>Dementia six months after stroke</td>
<td>20</td>
</tr>
<tr>
<td>Central pain after stroke</td>
<td>5-20</td>
</tr>
<tr>
<td>Bladder control on admission to hospital</td>
<td>50</td>
</tr>
<tr>
<td>Bowel control on admission to hospital</td>
<td>33</td>
</tr>
<tr>
<td>Incontinence one year after stroke</td>
<td>15</td>
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</tbody>
</table>

Source: Stroke Association (2013)

NICE found that early discharge – as soon as patients have some degree of stability and independence – is important. This gives a real benefit, provided it is accompanied by appropriate planning and support. Discharge planning should be carried out with patients and their friends and family. Emphasis is placed on good communication and clinical teams need to help patients make informed decisions based on the principles of person-centred care.

Follow-up should still be provided by a specialist stroke rehabilitation team, even after discharge.

**Rehabilitation needs**

“I did not die of course, and I was never in any pain, but physically speaking I’d been poledax. My left leg was immobilized and my left arm hung from its socket like a dead rabbit: the left side of my face, which drooped badly for about a week, felt frozen as if my dentist had just given me a massive Novocaine injection. I could not stand upright, my speech was slurred: to cope

with my incontinence my penis was attached to a Convene, a condom like device that drained my urine into a plastic bag. In place of pain there was a hallucinatory sense of detachment but I was also oppressed by an overwhelming fatigue.” (McCrum, 2015)

McCrum needed a range of clinical support in his rehabilitation. NICE (2013) guidelines recommend that stroke units and teams adopt an interdisciplinary approach involving consultant physicians, nurses, physiotherapists, occupational therapists, speech and language therapists, clinical psychologists and rehabilitation assistants. This core team can also draw on continence advice, dietetics, electronic aids, liaison psychiatry, orthotics (treatment of eye problems) and orthotics (for example, splints and shoe supports).

Rehabilitation also requires energy and determination. By definition, the stroke will have destroyed brain cells that cannot be regrown. Instead, the brain has to reorganise itself to refashion its lost functions. It is a little like a child learning new skills, except the brain learns within an existing structure that has been damaged. It is an exhausting process and can lead to post-stroke fatigue.

**Initial assessment**

The management of stroke and its sequelae is complex (Moorley et al, 2016b). What is fundamental to rehabilitation is that solutions are found by a multidisciplinary team working not only between specialties, but also with patients and their networks. Throughout his account, McCrum shows the central role played by his wife, not only in his rehabilitation but also in negotiating the care plan with the clinical team.

The study by Moorley et al (2014), undertaken in an outpatient stroke clinic in East London demonstrated that the use of objective assessments and reassessments is central to rehabilitation. Any rehabilitation care plan starts with an assessment; Box 1 lists what needs to be considered at this time. The person’s function and progress need to be measured objectively, using a tool such as the Barthel Index (Mahoney and Barthel, 1965) or the National Institutes of Health Stroke Scale (Fagge, 2011).

**Emotional lability**

“I cried a lot in hospital. Sometimes the tears were slow and weepy, at others uncontrolled and desperate. I could cry for any reason and none.” (McCrum, 2015)
In that extract, McCrum described an emotional liability that many patients experience. Stroke is a life-changing event usually occurring without warning and, hence, without psychological preparation. Hildebrandt (2015) suggests that as many as 50% of patients may experience a stroke-related psychological or emotional disorder, classified into four groups:

- Mood disorders – depression, post-stroke emotional anxiety;
- Behavioural and personality changes – anger, irritability, apathy, sexual changes, obsessive compulsive disorder;
- Cognitive and behavioural disintegration – acute confusional state and delirium;
- Perception identity disorders of the self or of other people and places.

Some are short term, some longer-lasting, but all are likely to compromise rehabilitation. They also cause suffering both to the person and those close to them.

The management of depression and anxiety after stroke is the same as in general practice: psychosocial support, cognitive behavioural therapies and medication. Hildebrandt et al (2012) stressed that staff should treat psychological problems with the same degree of attention as physical symptoms. Emotional wellbeing should be reassessed at formal six-monthly reviews.

Cognition

“I was[…] terribly confused about what had happened, confused and stunned, though unimpaired intellectually. I still have no recollection of where the hospital actually was, or how I got there.” (McCrum, 2015)

Despite this early disorientation, McCrum did not experience any long-term cognitive impairment. However, such impairment – with memory, orientation, language and attention issues – is experienced by many patients; more than a third are affected at three and 12 months after stroke (Winstein et al, 2016).

NICE (2013) recommends that cognitive function be assessed by valid tools, such as the Mini Mental State Examination or the function be assessed by valid tools, such as stroke (Winstein et al, 2016).

There are two types of communication problems patients may experience: dysarthria (a problem with the control of the movement involved in speaking) and aphasia, which results from damage to the brain’s language centres (Bowen et al, 2012).
Clinical Practice
Review

There is strong evidence that speech and language therapy can reduce language difficulties but no consensus on the exact provision of therapy (Bowen et al, 2012). NICE (2013) recommends:

- Referring people with suspected communication difficulties after stroke to a speech and language therapist (SLT) for detailed analysis of impairments and impact assessment;
- Providing appropriate information, education and training;
- Minimising environmental barriers to communication (for example, making sure signage is clear and background noise is minimised);
- Ensuring all written information relating to medical conditions and treatment (appointment letters, menus, rehabilitation timetables etc) is adapted for people with aphasia;
- Teaching those who talk to patients with aphasia communication skills, such as speaking more slowly, not interrupting and using communication props, gestures or drawing.

NICE's recommended interventions aim to reassert independence, building on the work of the occupational therapy team and using carefully chosen mobility aids. Shoulder damage is a constant threat to anyone with hemiparesis. As muscle control is affected, the dead weight of the arm can stretch the tendons or even cause dislocation. Pain in the shoulder is extremely common, as experienced by McCrum:

"Even the good nurses have no idea how much pain they can cause by wrenching my left arm, which is still totally paralysed and helpless, at the wrong moment." (McCrum, 2015)

All clinicians working with patients who have should pain or weakness need to be skilled in dealing with it. Techniques, such as dealing with the weakened arm first when dressing patients, can be helpful.

Movement

"My physical restrictions lessened but with excruciating slowness [...] the terrible frustration of trying to make a connection between my brain and my fingers, of imagining movements, while staring hopelessly at an immovable hand, was unquestionably amongst the lowest moment of these weeks..." For the first 12 weeks after my stroke I had to be pushed around in my wheelchair by Sarah [Robert’s wife] or by one of the nurses. The prevailing sense of helplessness was very difficult to come to terms with." (McCrum, 2015)

The effects of stroke on the body can be contralateral (experienced on the opposite side to where the damage occurred in the brain or ipsilateral (on the same side). Hemiparesis is unilateral weakness on the right or left side of the body. Occasionally, the term hemiplegia is used but this refers to a more profound lack of movement. These problems require their own detailed assessment and interventions. NICE (2013) and Winston et al (2016) recommend:

- For upper-limb weakness – repetitive training of reaching, grasping, moving and manipulating objects, and pointing;
- For lower-limb weakness – sit-to-stand transfers, walking and using stairs;
- For people able to walk (with or without help) – walking training, such as treadmill exercise.

Stroke recovery continues well after discharge and the last third of McCrum’s account focuses on life after leaving hospital. He noticed how the joy of being at home was tempered by a realisation that his disabilities were going to be part of his daily life, at least for a while. His marriage needed readjustment and he remained dependent on his wife to help him wash and dress for months – but his life did begin to come together. He continued with physiotherapy as an outpatient. Orthotics provided a brace for his leg and he experienced excitement when he could move his left arm again.

Eventually he was able to go back to work, but could not resume his former job. Patients may be unable to do this and must, instead, take on a different role.

NICE (2013) lists a set of priorities regarding return to work. Potential problems should be identified as soon as possible after the stroke, regularly reviewed and actively managed by:

- Identifying the job’s physical, cognitive, communication and psychological demands;
- Identifying factors that may impair work, such as physical limitations, anxiety or fatigue;
- Identifying those cognitive impairments that may affect multitasking and communication;
- Tailoring an intervention to the individual in the work setting.

Conclusion

This article covers the most common interventions in stroke rehabilitation. It illustrates that the real-world picture is complex – every patient may have a different set of problems, or similar problems that affect them in different ways. NT

References
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