

# Stroke: environmental barriers

Julie Swann is an Independent Occupational Therapist

A stroke can affect any part of the brain and can cause dysfunctions including a loss of physical abilities and cognitive and perceptual problems. Physical problems increase if there is spasticity (increased muscle tone) or if compensatory patterns of movement occur.

## Physical problems

Problems can arise owing to reduction of muscle power, limitation of the range of active movement, loss of joint-position sense (the ability to know where a limb is in relation to one's body), sensory impairment, and impaired co-ordination. Many aspects of mobility can be adversely affected, such as:

- Balance
- The ability to transfer
- Standing tolerance
- Bending
- Walking
- Step and stair management.

In particular, ankle instability or a limitation in the range of ankle movements can occur and will increase difficulties managing uneven or ramped walking surfaces. Some people may use walking aids or a wheelchair and require greater room to manoeuvre.

Upper-limb problems can cause difficulties with activities including tasks that require fine finger movements or the use of two hands. This can affect management of tasks such as opening doors, managing light switches and operating call-systems.

## Cognitive and perceptual problems

Strokes can also cause cognitive and perceptual problems, such as apraxia (difficulty carrying out a previously learned task) or agnosia (difficulty recognizing a familiar object). The Intercollegiate Working Party for Stroke (2000) noted the significance of cognitive-perceptual problems on functional abilities stating that:

**'25% of long-term survivors have such severe generalised impairment that they may be diagnosed with dementia.'**

There is a multitude of complex perceptual and cognitive dysfunctions, ranging from being unable to work out the correct orientation of an item to coping with the sequence of an action or task. Understanding complex instructions or using unfamiliar items can be difficult.

Golisz and Toglia (1998) identified difficulties with the

## Abstract

A stroke can have a devastating effect not only on a person's physical function but also on their cognitive and perceptual abilities. This article concentrates on difficulties that can occur for people who have suffered from a stroke that cause problems managing their environment. It will describe ways to make access easier and facilitate the management of tasks.

### Key words

■ Strokes ■ Barriers ■ Environments ■ Part M

following aspects of cognition and perception:

- Orientation
- Insight and awareness
- Attention
- Visual processing (visual discrimination and visual motor skills)
- Unilateral inattention (neglect)
- Motor planning
- Memory
- Executive functions such as organization and problem-solving skills.

Cognitive and perceptual problems will make negotiating unfamiliar environments even more problematic. Healthcare staff should be aware of the problems that may arise and try to simplify a task for their patients if problems occur.

## Visual neglect or inattention

Healthcare staff should be aware of any visual problems, such as hemianopia or inattention. Visual inattention, also termed 'visio-spatial neglect', is defined as:

**'the inability to perceive a stimulus in a visual field when a similar stimulus is presented and perceived simultaneously in the homologous visual field'** (MediLexicon, 2007)

Inattention is more common in a right-sided parietal or parieto-occipital brain damage (affecting the left side of the body).

Staff may notice that patients are unable to see them if they stand to one side, or the patient may bump into objects or seem to ignore items on one side. All items should be placed within the range of vision, but patients should be encouraged to look towards the neglected side. Items like books, the TV remote-control, glass of water or other necessities can be placed on the neglected side (Davies, 2008). Talk to a patient as you approach them to

**Table 1. Functional problems**

Problem	Suggestions
<b>Mobility</b>	
Difficulty rising from a low chair or chair without arms	Chairs with higher seats with arms
Poor or limited standing balance	Adequate provision of seating including a fold-down seat inside a lift
Problems walking over uneven surfaces or loose stone coverings on driveways, car parks and paths	Replace with Tarmac, brick or concrete
The need to use a walking aid which necessitates the need for a larger turning circle	Adequate space to manoeuvre with walking aids; ensure that toilet and bathroom doors open outwards and there is sufficient turning space
Poor gait, for example owing to hip-hitching, dragging the affected leg, or ankle instability causing problems walking on thick-pile carpet	Suitable floor that is slip-resistant
Difficulty managing thresholds	Removal of thresholds
Difficulty managing steps and stairs	Installation of bilateral handrails; replace with a low-rise ramp (gradient 1:20) with platform at the top Provide a passenger lift with a drop-down seat for ambulant disabled people.
The need to use a wheelchair	Doors should have built-in visibility panels at the correct height Avoid the need to negotiate narrow doorways and passages Ensure all essential fixtures can be used by both wheelchair and ambulant disabled users
Managing a lift	A lift should have a mirror on the far wall to facilitate manoeuvring Control and emergency calls should be within reach Install a lift that allows forward access and egress
<b>Reduced arm function</b>	
Unable to reach alarm pull-cords	Place to one side within forward (not sideways), reach of toilets (as an affected arm may not be able to pull the cord) Use enlarged end-pulls on cords
Difficulty reaching light switch	Replace light switch with a sensor-operated light or with a rocker plate that is accessible for a wheelchair user or ambulant person.
Unable to reach pull-cord above bed	Re-site within reach or use an extension lead (Figure 1)

encourage them to turn towards the neglected side.

### Impairment and disability

There is an important distinction between impairment and disability. The Department of Health (DH) (2003) explains that:

**‘Disability is shown as being caused by barriers or elements of social organisation that take little or no account of people who have impairments. Society disables people who have impairments because**

**the way it has been set up prevents disabled people taking part in everyday life.’**

The report emphasizes the need to pay attention to organizing and structuring society by removing barriers to enable disabled people to participate fully.

### Barriers

Barriers are often construed as physical but also include:

- Prejudice
- Stereotypes

- Inflexible organizational procedures and practices
  - Inaccessible information
  - Buildings and transport. (Department of Health, 2003)
- Barriers prevent the successful negotiation of public environments and hinder rehabilitation. Physical barriers (Table 1) to participation can be removed, or not made in the first place, by good inclusive design of buildings and their surroundings.

The concept of a Lifetime Neighbourhood is outlined by the Communities and Local Government (2008). Lifetime Neighbourhoods have transport, shops, green spaces, toilets, and benches consciously planned with people of all ages and conditions in mind. This will be of benefit to anyone with access problems. These are problems that are encountered by people carrying bags or luggage, parents struggling with prams or when accompanying young children. Safe access makes sense and it will lead to advantages for all groups of people, particularly our ageing society.

Planning and implementation guidance on lifetime neighbourhoods will be developed on practical features to promote accessibility, such as:

- Paving and kerb design
- Access to public amenities
- Public toilets
- Street lighting
- Accessible public transport
- Appropriately located bus stops
- Disabled parking bays
- Green spaces
- City design (including information, finding one's way and obtaining services). (Communities and Local Government, 2008)

## Problem areas

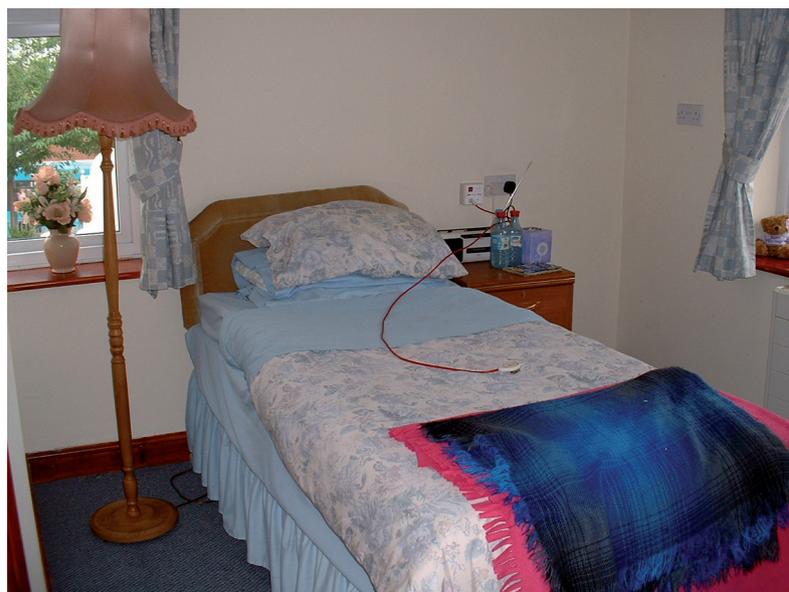
Some problems are identified in Table 1 and some solutions are offered. Often a combination of suitable furnishings, the removal of environmental obstacles, and positioning items within reach is needed to overcome access problems within a hospital or clinic.

## Building regulations

The Disability Discrimination Act (1995) was strengthened on 1 October 2004 when the providers of businesses, services and other organizations were required to make 'reasonable adjustment to overcome physical barriers' for disabled people who want to gain access to their services or use a public building and its facilities. Details are in the Approved Document M - *Access to and Use of Buildings*, which is Part M of the *Building Regulations* (see *Further Information*). This Act applies to all new buildings or major refurbishments, e.g. extensions to buildings, or where an entire washroom or bathroom is being refurbished with a new product. Design considerations include the following:

- A new-build house must have one entrance that is accessible by a wheelchair user

Figure 1: Carers can be alerted if alarm-cord extensions are used



- If a gradient is present, this should be minimal (less than 1:20)
- Revolving doors are no longer recommended in public buildings
- The opening force at the lead edge of a door should be no greater than 20N (Newton).

## Areas covered in Part M

This Act covers all types of access for all people including:

- Wheelchair users
- Those who are ambulant disabled
- People with learning difficulties
- Anyone with a hearing or visual impairment
- Anyone who lacks tactile sensitivity
- People of either sex with babies and small children.

Perhaps the term 'accessible' instead of 'disabled' facilities should be used, as this starts from the assumption that you want everybody to use the facilities. If creativity is applied,



Figure 2: Assisted door openings

Figure 3: Toilet that complies to Part M of building regulations



accessibility issues can be solved with relatively little cost. The three main areas that patients have problems with are way-finding, and accessing buildings and accessing toilets.

### Entrances and doors

Assisted door opening or automatic doors are becoming increasingly used (Figure 2) to help with door opening. Level access is easier to negotiate than stairs, steps or a ramp.

### Way-finding

Within a hospital or clinic, signage should be easy to read and understand to assist with way-finding. Colour contrast is often used to help way-finding or to aid identification of corridors and doors. It is easier to see a differently-coloured door than to look for a small identification plate.

### Toilets and washrooms

All public toilets should have at least one 'ambulant' cubicle with a door that opens outwards. Space inside cubicles can be confining necessitating moving to the side

## Key Points

- Cognitive and perceptual problems add to difficulties managing mobility and self-care.
- Barriers hinder a person's rehabilitation and re-integration.
- The environment should be inclusively designed to be a Lifetime Neighbourhood.
- Removing physical barriers will help people with children as well as those who have access issues.
- Good planning will avoid the need for later expensive adaptations.

## Further information

Approved Document M:  
**Access to and Use of Buildings (2004)**  
 RIBA Bookshops Mail Order, 15 Bonhill Street,  
 London, EC2P 2EA.  
 Tel: 020 7256 7222 Fax: 020 7374 2737  
 www.ribabookshops.com  
 Free to download at <http://tinyurl.com/5mbbq6>  
 Website: [www.bbsf.org.uk](http://www.bbsf.org.uk)

of the toilet to shut or open the door. There should be two horizontal grab rails (to assist to stand and sit) and at least one vertical rail (to steady when standing) (Figure 3). The suggested height of a toilet is 480mm from the floor. Taps ideally should be single-lever and placed in mid-line or be sensor operated. Often soap dispensers, toilet-paper dispensers, hand-drying machines or paper-towel dispensers are out of reach.

If a pull-cord alarm is installed, the bangle should be within reach and extend to 100mm above the ground so that if a person falls on the floor the cord is within reach.

'Disabled' toilets that are specially designed for wheelchair users often do not have any mirrors, implying that 'disabled' people are not concerned about their appearance.

## Conclusion

The environment can hinder or help activities such as personal care. All staff should be aware of the problems that the patient has; particularly any impairment of their physical, cognitive and perceptual abilities. Healthcare staff can help to ensure that patients are assisted to manage their environment and ensure that problems coping with the environment have not been overlooked. This can be achieved simply by placing items within reach and by bringing problem areas to their line-managers.

When alterations are being carried out, it is sensible to make sure that the position of items like lighting, switches or door handles are accessible for most people. With a little forethought, life can be made easier for people and enable them to maintain and improve their level of independence.

BJHCA

Communities and Local Government (2008) *Chapter 8 Lifetime Neighbourhoods in Lifetime Homes, Lifetime Neighbourhoods: A National Strategy for Housing in an Ageing Society*. <http://tinyurl.com/3lq9bm> (Accessed 14 October 2008)

Davies J (2008) *One-side Neglect: Improving Awareness to Speed Recover*. American Stroke Association, Online. <http://tinyurl.com/3hy5du> (Accessed 14 October 2008)

Department of Health (2003) *Independence matters: an overview of the performance of social care services for physically and sensory disabled people*. DH, London. <http://tinyurl.com/43a569> (Accessed 14 October 2008)

Golisz KM, Togliola JP (1998) Evaluation of perception and cognition. In: Neistadt ME, Crepeau EB (eds) *Willard and Spackman's Occupational Therapy*. (9th ed) Lippincott, Philadelphia

Intercollegiate Working Party (2000) *National Clinical Guidelines for Stroke*. Royal College of Physicians, London. <http://tinyurl.com/3jkdrrj> (Accessed 15 October 2008)

MediLexicon (2007) 'Visual Inattention'. <http://tinyurl.com/3ux8m6> (Accessed 14 October 2008)