

AbilityNet Factsheet – April 2018

Stroke and computing

Each year in the UK, around 150,000 people have a stroke. Most of these strokes are caused by a blockage cutting off the blood supply to part of the brain, but they can also be caused by bleeding in or around the brain.

Without blood, brain cells become damaged or die. Depending on where it happens, this damage can have different effects. A stroke can affect how your body works, and also how you think, feel and communicate.

All strokes are different. For some people, the effects may be relatively minor and/or short-lived; for others, the problems may be more serious and/or longer-term. Whatever the effects, there are many ways that assistive technology can help to improve confidence and the quality of life for people affected by stroke, including by:

- making computers and tablets easier to use
- supporting physical therapy
- helping with cognitive difficulties
- making communication more effective.

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1 Making computers and tablets easier to use

Physical problems after a stroke

Most people will have weakness in their muscles after a stroke. This affects how well you can move different parts of your body. It is quite common for muscle weakness to affect a whole side of your body, or you may only have it in just one arm or leg.

Other physical effects of stroke can include:

- problems with stamina – this can make you clumsier and make it harder to control your movements as you become tired more quickly
- spasticity – this makes it more difficult to move your arms and legs because your muscles have become very stiff and tight.

Such problems can prevent you from being able to use ‘normal’ computing equipment, especially if it has not been properly adapted to match your needs.

Practical alternatives to using standard input devices are summarised below. These options are covered in more detail in our free factsheet on *Keyboard and mouse alternatives and adaptations*.

Further advice is also available at *My Computer My Way*. This gives easy-to-follow instructions on how to adapt your computing equipment to meet your particular needs. It is an interactive tool developed by AbilityNet that makes any computer, tablet and smartphone easier to use. You can use *My Computer My Way* for free at www.abilitynet.org.uk/mcmw

Keyboard adaptations and alternatives

For some users, adapting your existing keyboard may be all that is necessary to enable you to continue to use it successfully. There are a number of ways you can do this, including by:

- modifying the keyboard’s response – for example, by using ‘StickyKeys’ which allows you to input any command by pressing only one key at a time
- using a keyguard over your keyboard – to make it impossible to press two keys at once
- using mounting equipment – to raise up or tilt a keyboard (or tablet), or to attach it to a wheelchair (or something similar).

Possible alternatives to the standard computer keyboard that might better suit someone experiencing more substantial motor difficulties include:

- keyboards with a smaller number of larger keys – like the *BigKeys LX*
- single-handed keyboards
- chording keyboards – like the *Cykey*, which work well for one-handed users with independent movement in their fingers
- customisable adaptive keyboards – for example, like the *Helpikeys*
- typing without a keyboard – for example, by using an on-screen keyboard or your voice.

Mouse adaptations and alternatives

A standard computer mouse can be difficult to use if you have motor problems. However, for some people, it may be sufficient to adapt the way you use it, including by:

- making more use of the keyboard
- adjusting how the mouse works – including its speed and how the click buttons operate
- using ‘drag lock’ – to make it easier to cut/copy and paste text or pictures.

If you do need a different type of mouse, there are many alternatives. It is important to choose one that feels comfortable and easy to use. Possible options include:

- an ergonomic or vertical mouse – to relieve strain on the hand and wrist
- a bar mouse – to eliminate the need to reach sideways
- a trackball mouse – to reduce wrist movement
- a joystick – with buttons for left, right and double clicks
- a touchpad – like those often found on laptops
- a touchscreen monitor or computer.

Using head (or eye) movement to control the pointer, together with an on-screen keyboard, can also be an effective solution if you have very little or no use of your hands.

Our factsheet on *Keyboard and mouse alternatives and adaptations* also provides information on alternative ways of clicking. External switches, for example, can be operated in a variety of ways by using different parts of the body or a mouth tube. The factsheet also gives contact details for several specialist suppliers of assistive technology.

Voice control

Continuing advances in technology are enabling growing numbers of people to use voice control to operate their computer, tablet, smartphone or smart speaker.

Using simple spoken commands, you can now quite easily:

- open and run different software and apps
- produce and format documents and notes
- write and send texts and email
- make calendar appointments and programme reminders
- play music, videos and photo displays.
- make telephone and video calls
- get directions
- stay connected through social media
- control smart home appliances
- search the internet and browse individual websites.

Some operations require specialist voice recognition software – for example, like *Dragon NaturallySpeaking* (for Windows) or *Dragon Dictate* (for Mac). However, quite powerful speech recognition programmes are now built into new computers, tablets, smartphones and smart speakers.

Advances in ‘natural voice’ technology and artificial intelligence have also seen the continuing development of ‘virtual personal assistants’ like *Siri* (for Apple devices), *Alexa* (for Amazon Echo devices) *Google Assistant* (for Android devices) and *Cortana* (for Microsoft devices). These are further opening up the world of productive possibilities for everyone who struggles to use more traditional computer technology.

See our free factsheet on [Controlling the computer with your voice](#) for more detailed information.

Vision problems after a stroke

Around 60% of stroke survivors have vision problems immediately after their stroke, with this proportion reducing to about 20% after three months. There are a number of different vision problems a stroke can cause, and these can add to any sight impairment you might already have.

Our free factsheet on [Vision impairment and computing](#) gives an overview of how computers can be adapted to help anyone with vision problems. However, for many stroke survivors, voice control may offer a more practical way forward.

Increasing numbers of people with impaired vision now use their smartphone more than any other computing device, and our factsheet highlights a number of particularly useful apps. The more recent development of smart home speakers has further negated the need for many to work with more traditional computing devices.

2 Supporting therapy

Physical therapy

Most stroke survivors experience significant improvements in any physical problems within the first few months. Recovery usually slows down after this but, with physiotherapy, many people continue to gain in strength, balance and fitness over the longer-term.

The NHS ‘mytherapy’ team have identified the best, and mostly free, apps for supporting you to regain strength, movement and fine dexterity in your arms and fingers after a stroke and, also, to help improve your stamina and energy levels. These are:

- *Balloon Frenzy!*
- *Hit It* (Android only)
- *Dexteria*
- *iOT*
- *Couch to 5K*
- *SitFit* (iOS only)
- *Squeezy*
- *Mind App for Alzheimers, Parkinsons and Neurological Disorders* (iOS only).

Vision therapy

An orthoptist (an eye care specialist) or ophthalmologist (medical doctor specialising in eye diseases) can advise you on possible treatments if you have problems with your vision after a stroke.

mytherapy have also identified some of the best apps that could help you to strengthen the muscle movements in your eyes, learn how to overcome a visual inattention or neglect or compensate for a visual deficit. The team recommends:

- *Attention Test* (Android only)
- *Vision Tap* (iOS only)
- *VisionSim* (iOs only)
- *Visual Attention Therapy*.

3 Helping with cognitive difficulties

Cognitive impairment is very common after a stroke and most people experience some difficulties with their thinking, especially in the first few months. The kind of cognitive problems that affect many stroke survivors are:

- memory problems – many of which are actually caused by difficulty concentrating
- concentration problems – getting easily distracted and finding it hard to focus
- problems with planning and problem-solving – potentially affecting your ability to work out how to do some things, complete tasks or ‘read’ people

- other problems – including difficulty finding your way around, not recognising things and feeling confused.

Such cognitive problems are likely to improve very quickly over the first few months of recovery. There are also many ways that assistive technology can help make them easier to live with, including by using computers, tablets or smartphones to:

- help you relax – for example, by playing restful music or meditating
- remind you to take your medications at the right time
- keep track of appointments and set alerts for important events – using built-in calendars
- create labels and signs, and print pictures, to help you remember what to do and where things go
- make notes before and after medical appointments, create ‘to do’ lists for the next day and write out instructions for you to follow when you do things
- make voice recordings if ‘typing’ is difficult.

Although it is an entirely different and progressive illness, people with (early-stage) dementia face quite similar cognitive problems. Our factsheet on *Dementia and computing* provides more detailed information on the many ways that assistive technology can help to support key aspects of daily life for anyone who has problems with memory and thinking.

mytherappy recommendations

The mytherappy team have identified a number of useful apps to help stroke survivors with cognitive impairment. These include *Headspace* and *Jon Kabat Zinn* series for **mindfulness and meditation**; and *Tic Tac Toe*, *ColorMe* (for iOS only) and *Breathe2Relax* to aid **relaxation**.

The team also recommends a larger number of apps to help with **thinking and cognitive rehabilitation**. These work on your concentration and ability to take in information to increase your mental speed, memory and problem solving.

Titles include:

- | | |
|--------------------------------|---|
| ▪ <i>Peak</i> | ▪ <i>Jigsaw Puzzle</i> (Android only) |
| ▪ <i>Matches 2</i> (iOS only) | ▪ <i>Visual Memory</i> (Android only) |
| ▪ <i>Flow Free</i> | ▪ <i>Brain Training</i> (Android only) |
| ▪ <i>Memorise</i> (iOS only) | ▪ <i>Word Search</i> (Android only) |
| ▪ <i>Lumosity</i> | ▪ <i>Puzzler Word Search</i> (iOS only) |
| ▪ <i>Jigsaw Box</i> (iOS only) | |

4 Making communication more effective

Stroke is the biggest cause of aphasia – a communication disorder resulting from damage to the language centres of the brain. Aphasia causes difficulty speaking or understanding what is being said. Around one third of people who have a stroke will experience aphasia and, while many recover, about half will have long-term communication problems.

There is an extensive range of both low- and high-tech communication aids that can help to improve communication for someone with aphasia by supporting:

- augmentative and alternative communication (AAC)
- speech and language therapy.

Some of the options utilising assistive technology are outlined below, and further information is available in our factsheet on *Communication aids*.

Augmentative and alternative communication

AAC describes various methods of communication that can ‘add-on’ to or replace speech to help people express themselves and aid understanding. It includes simple, everyday methods such as pictures, gestures and pointing, as well as more complex techniques involving computer technology.

There is no single ‘best’ type of AAC system, and the most suitable one for an individual will depend on their own specific needs, abilities and preferences. With so many (often costly) options available, it is important to seek specialist advice, training and support from a local speech and language therapist (who can refer you on to a specialist centre if necessary).

Voice output communication aids (VOCAs)

VOCAs use a computer-generated voice to play electronically-stored speech. They can be operated easily in a variety of ways to select pre-recorded messages. Sentences and longer messages can be strung together from individual words or phrases, and the vocabulary can contain several thousand words. If you can still use a keyboard, some VOCAs will convert typed text into synthesized speech – the quality of which has much improved.

There are many factors to consider in determining whether a VOCA would benefit an AAC speaker, and also in selecting the most suitable option. A local or regional AAC assessment service can advise on possible equipment that could be tried as part of an assessment. Some centres (and suppliers) are also able to lend equipment for you to try out before buying.

Software and apps

An extensive range of software and apps for communication is available for computer, tablet and smartphone. Many of these use symbol sets to augment communication, with different sets available to match different communication needs and abilities. You can form personalised messages by selecting and grouping symbols together, and some applications will let you add text, photos, videos and sound.

Comprehensive symbol and text communication packages with speech output, catering for beginners to advanced users, include:

- *Grid 3* (for PC)
- *Grid Player* (for iPad)
- *Proloquo2Go* (for iPad)
- *Predictable* (for iOS and Android)
- *Talking Mats* (for iPad).

Speech and language therapy

Computer-based therapy can also help to improve your communication skills after stroke, especially when this is tailored to your individual needs. It is very important that anyone with aphasia has a thorough assessment from a speech and language therapist to determine which particular tools and techniques will best support their personal recovery.

mytherappy recommend a variety of communication apps that might be used to support a personal treatment programme:

- *I have Aphasia* (iOS only)
- *Bla Bla Bla* (iOS only)
- *Oro motor – small talk* (iOS only)
- *Speech tutor* (iOS only)
- *Speech therapy for Apraxia*
- *Reading Rehabilitation Toolkit* (iOS only)

The team also recommend a large number of language and speech therapy apps produced by Tactus Therapy Solutions (for iOS devices). These may be bought individually or as part of a bundle. The *Language Therapy* toolkit, for example, encourages a rounded approach with four complementary apps focusing on reading, writing, speaking, and listening. For more information, visit www.tactustherapy.com

Other recommended apps

To help you find your way through an ever-expanding range of potentially useful media, a number of organisations have developed their own lists and tools to help people with aphasia find apps and software that may be useful to them.

These include the *Aphasia Software Finder* – a website developed with the support of the Tavistock Trust for Aphasia – that allows you to:

- search for specialist software and apps that work on different aspects of communication
- get information about a particular app or piece of software
- compare the key features of available apps and software
- find other general apps and software that may be useful for someone with aphasia.

To use the Aphasia Software Finder, visit www.aphasiasoftwarefinder.org

Call Scotland have produced two 'wheels' of AAC apps – one for iOS, one for Android. These provide categorised guides to useful apps for people with complex communication support needs. You can download both the wheels at:

- www.callscotland.org.uk/downloads/posters-and-leaflets/

Other recommended apps for people with aphasia include:

- *Constant Therapy* – an award-winning app that can help improve speech, language, cognition, memory, reading, attention and comprehension skills.
- *Virtual Hope Box* – a smartphone app designed as an accessory to treatment to help patients with coping, relaxation, distraction, and positive thinking.

5 Other resources

My Computer My Way

It is essential that your computing equipment is set up the best way possible to suit your particular needs.

My Computer My Way can help you achieve your optimum setup. It is a free, interactive tool developed by AbilityNet that makes any computer, tablet and smartphone easier to use. It covers all the accessibility features built into your computer, laptop, tablet or smartphone, and all the main operating systems – Windows, Mac OS X, iOS and Android.

My Computer My Way shows you how you can adjust your computer to assist with vision and hearing impairments, motor issues and cognitive problems. You can use it for free at www.mycomputermyway.com

AbilityNet factsheets

AbilityNet's factsheets provide practical advice about specific conditions, and the hardware and software adaptations that can help people of any age use computers to fulfil their potential. Relevant topics covered include:

- *Communication aids*
- *Dementia and computing*
- *Vision impairment and computing*
- *Controlling the computer with your voice*
- *Keyboard and mouse alternatives and adaptations.*

All these resources are free to download from www.abilitynet.org.uk/factsheets

6 Useful links

Stroke Association

The Stroke Association is a UK-wide charity dedicated to conquering stroke. It provides information and support to anyone affected by stroke and campaigns for better stroke care and to find better treatments.

It operates the Stroke Helpline on 0303 3033 100, or you can email info@stroke.org.uk

The Association has also produced a self-management tool called *My Stroke Guide*. This provides practical tools to help stroke survivors understand stroke and deal with its effects alongside peer support to combat feelings of isolation. The guide is available online at www.mystrokeguide.com and can also be downloaded as a printable PDF.

Aphasia Now

Aphasia Now is a social initiative run by and for people with aphasia – to promote independence and communication with other aphasic people.

For more information, visit www.aphasianow.org

mytherappy

The mytherappy app toolkit has been developed and is maintained by impartial NHS specialists and patient reviews. Approved apps to complement your rehabilitation and therapy are tested against a 50-point objective scale.

For more information, visit www.my-therappy.co.uk

Communication Matters

Communication Matters supports people with little or no clear speech. It works to promote the best possible communication for people with complex communication needs, and aims to involve people using AAC in all its work. The charity maintains a database of AAC Assessment Centres across the UK.

For more information, visit www.communicationmatters.org.uk

Living Made Easy

Living Made Easy is an online guide developed by the Disabled Living Foundation. It provides impartial advice about independent living for disabled adults and children, older people, their carers and families. Its section on AAC provides extensive information about available products in different categories – including prices, manufacturers' details and suppliers.

For more information, visit www.livingmadeeasy.org.uk

Inclusive Technology

Inclusive Technology is a supplier of software and hardware for special educational needs – including a range of communication aids and communication software.

For more information, visit www.inclusive.co.uk or call 01457 819790.

7 About AbilityNet

AbilityNet is the national charity that supports people with any disability, of any age. Our specialist services help disabled people to use assistive technology and the internet to improve their lives, whether at work, at home or in education. We offer:

- free advice and information
- accessibility services
- DSA/student assessments
- workplace assessments
- consultancy services
- IT help at home
- IT volunteers.

Support us

Visit www.abilitynet.org.uk/donate to learn how you can support our work.

Contact us

- Telephone 0800 269 545
- Email enquiries@abilitynet.org.uk
- Web: www.abilitynet.org.uk

We are always keen to help share knowledge about accessibility and assistive technology. If you have any questions about how you may use the contents of this factsheet, please contact us at AbilityNet and we will do all we can to help.

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