Technology and Aphasia Review

Completed in 2018 by:

Kathy Cann: Clinical Lead for Communication
County Durham and Darlington NHS Trust

Louise Bulman: Professional Context Student
Newcastle University Speech Sciences.

This report has been designed to meet accessibility standards and guidelines with support from Aphasia Friendly Resources.

Introduction:

This study aimed to explore:

- What technology is being used with aphasia?
- What technology is being used for aphasia therapy?
- What technology is being used to support communication?
- How is technology being used socially in relation to aphasia?
- Is there any difference between use of technology by people with aphasia, their family and friends, speech and language professionals and others?
- What are the barriers to using technology?
Method:

We used the World Health Organisation ICF framework to think about aphasia and how technology interfaces with it.

The ICF is a:
- **universal** model – for all people, not just people with disabilities
- **holistic** model - focuses on the whole person + their environment
- **strengths-based** model – highlights what people can do!
- **interactive** model – shows the interaction between a person + their environment

We asked *7 key questions* about technology:

- What **hardware** you used
- Which apps you used for **therapy**
- Which apps you used to **support communication**
- If any **accessibility functions** were helpful
- What online tools you use to **access information**
- If you use **social media** and if so; what and how
- Are there any **barriers** that stop you using technology

We used our experiences at CDDFT NHS Trust to frame our questions. We encouraged you to share your experiences via free text boxes.
The survey was built in the Newcastle University form builder and disseminated by:

- **Email** to CDDFT staff and other Trusts in the UK
- **Face to face** with conversational support via the CDDFT, Aspire groups and friends and family.
- **Twitter:** @KathyCann1
- **Facebook pages:** Aphasia Friendly Resources and Aphasia Recovery Connection

![Calendar Image]

We promoted the survey for **4 weeks** between the 5th November and 1st of December 2018:
Two hundred and seventy two people replied from all over the world.

The others:

Twenty two people checked the other box. They included:
- Stroke Practitioner Nurses - 3x
- Staff Nurses - 5x
- Occupational Therapists - 2x
- Stroke Co-ordinators - 4x
- AT Specialist - 1x
- Volunteers - 2x
- Students - 1x
- Case manager - 1x
- Therapy assistant - 1x
- Researcher - 1x
- Music Therapy student - 1x

Because of how the survey was formatted the ‘other’ professional has been included with speech and language professionals. However, ‘other’ free text responses have been analysed separately.

This survey was circulated via face to face sessions and email but most of our respondents were from the UK and sourced via social media. Therefore, there is a bias towards English speaking users who are already familiar with technology. Ideally this data should be benchmarked against other sources of data on this subject.
<table>
<thead>
<tr>
<th>The following sections contain the results, evidence and discussion for each question asked in the survey:</th>
</tr>
</thead>
<tbody>
<tr>
<td>What hardware is being used?</td>
</tr>
<tr>
<td>What apps/software is being used for therapy?</td>
</tr>
<tr>
<td>What apps/software is being used to support communication?</td>
</tr>
<tr>
<td>Do you use any accessibility functions on device?</td>
</tr>
<tr>
<td>Where do you source information online?</td>
</tr>
<tr>
<td>Do you use social media?</td>
</tr>
<tr>
<td>What barriers are there to using technology</td>
</tr>
<tr>
<td>Appendices - disclaimer and key</td>
</tr>
<tr>
<td>Appendix 1: List/links to apps/software is being used for therapy.</td>
</tr>
<tr>
<td>Appendix 2: List/links to apps/software used to support communication.</td>
</tr>
<tr>
<td>Appendix 3: List/links to social media referenced</td>
</tr>
<tr>
<td>References</td>
</tr>
</tbody>
</table>

Contributions from people with aphasia are in green text box

Contributions from friends and family of people with aphasia are in purple box

Contributions from speech and language professionals are in blue text box

Contributions from other people orange box text
Tablets are the most commonly used device across all surveyed groups. Phones, desktop computers and laptops were also popular.

What hardware is being used?

General population statistics show desktop and mobile ownership is much more common than tablet. However, this survey suggested people with aphasia are most likely to have access a tablet.

Further analysis suggests this discrepancy is linked to device ownership. Privately owned device stats reflect global statistics whereas service provider owned devices do not.

Are speech and language professionals using devices which are service provider owned or service user owned?
10.7% of people reported using wearable technologies. This survey did not clarify how wearables are being used to support communication. However, research is showing they are potentially a useful means to promote participation by increasing motivation/awareness of the time spent communicating.

For example:
- CommFit paired with bluetooth headphone; Bradenburg et al (2015)
- Streachable sensors that can provide feedback on daily communication habits, Mischke (2018).

Service providers may prefer tablets due to
- finance and security constraints
- larger screen size maximizing accessibility for multiple users with varying visual/motor skills
- specific aim of speech and language therapy activity use and ability to ‘lock down’ to this use
- more speech and language specific apps being available on tablet than mobile.

**Research** exploring whether device type has an impact on accessibility for people with aphasia is limited.
- Manzoor et al (2018) explored which digital services facilitate social integration for people with various disabilities. A literature review of papers over 6 years, found no concrete patterns regarding the type of technology or technological trends supporting individuals with disabilities.
- Greig, C. et al (2008) explored barriers and facilitators to mobile phone use for people with aphasia. Results indicated design was a key factor but also written support, access to training, and communication partners had a significant impact.
Do you use apps/software for therapy?

The use of apps/software for therapy was most common amongst speech and language professionals (81%). People with aphasia were least likely to be accessing apps to support therapy (56%).

This may suggest technology use for therapy is most beneficial/ accessible/ preferred in conjunction with a speech and language therapist as suggested in some research.

Which of these therapy apps/software do you use?

Amongst the apps surveyed, Tactus apps were used most by all groups.

Constant Therapy was also mentioned frequently in the comments.

Speech and language professionals were using online software packages such as React2 and Step by Step significantly more than people with aphasia. This maybe due to the subscription format for accessing these resources and higher/repeated cost to individuals, compared to apps which are usually a lower and one off cost.
A huge variety of software and apps are being used to support aphasia therapy by all groups. Many of these apps are not specifically designed for use with aphasia - for example; Farmville for conversation opportunities, power point for creating interactive exercises, Lumosity, Elevate and Brain Yoga for cognitive and language activities.

Some software can be set up remotely by therapists and some provides feedback/results.

Research into the effectiveness of online/digital therapy is limited. Many of these resources are described as ‘evidence based’ but few have featured in research such as randomised control trials.

Exceptions include:

**Constant Therapy** which was used in a study exploring the effectiveness of impairment based individualized rehabilitation using a software platform (Roches et al (2017)) and provides preliminary evidence for the usefulness of a tablet based platform to deliver tailored language and cognitive therapy to individuals with aphasia

**Lumosity** showed improvement in trained tasks in research completed by Finn and McDonald 2011.

**Step By Step** used in the BIG Cactus study (Palmer et al 2015) showed improvement in word finding that lasted for at least 6 months post intervention. However, the study did not show carry over of improved use of words in conversation for most participants or change their perceived quality of life.

**EVA Park** a virtual reality software co-designed by people with aphasia in collaboration with researchers in human-computer interaction and speech and language therapy has shown some functional communication improvements in preliminary studies (Marshall 2016).

Some research highlights the benefits of therapist support when participating in computer therapy (Kurland etal 2014, Roches et al 2015), whilst other recognises self managed computer therapy programmes as having positive outcomes (Pederson et al. 2001; Stark 2018, Zheng et al. 2014).
Do you use apps/ software to support communication?

These results, combined with respondents choices of which apps they use most, and participants comments, suggest perceptions of what it means to 'support communication via technology' vary.

People with aphasia significantly favoured apps which were integral to their device - photo, video, text and video call much more than apps designed to specifically augment communication; such as Proloquo2go or Predicatable.

The apps people with aphasia said they also found helpful were nearly all ones that were non speech and language specific. Apps such as Grammarly, predictive texting, Uber, Find a friend. Apps which reduce the demand on speech and language skills whilst enhancing access to life participation activities. Mainstream apps, without disability focus. A number of comments from people with aphasia referred to a dislike of apps that they associated with disability.

Friends and family also reported their friend/ relative with aphasia used photo, text and video call apps the most.

This group reported a higher use of apps that augment communication (e.g. Proloquo, Predicatable), possibly because this group represent people with more severe aphasia than the group who completed the survey for themselves. However, information on the type/ severity of aphasia was not specifically recorded in this survey. The majority of the friends and family group (73%) said they didn't use any tech to support communication. Reporting a preference for direct verbal/ non verbal communication by and with the aphasic person.

Speech and language professionals used/ recommended an extensive range of SLP specific and general apps to support communication but they could further expand their repertoire by learning from the people with aphasia group who are really using apps holistically when considering how they support communication e.g. uber, meditation, find a friend.

There is a huge diversity of apps available with potential to enhance quality/ access to life for people with aphasia. Unsurprisingly this survey has found people with aphasia are the most dynamic and adaptable at finding tech solutions to communication barriers. Speech and Language professionals/ researchers need to follow their lead.
Which of these apps/software do you use to support communication?

People with aphasia

You also use:
- White board
- Lyft/Uber
- Find a friend
- Read2go
- iWordQ
- meditation
- Sprint IP relay
- Cambridge English Grammar
- Grammerly
- Encarta
- Dragon dictate
- Predictive texting
- Google assistant
- Email
- Voice mail transcription

Professionals

Friends and family

You also use:
- chattable and whiteboard.
  Lots of you said your friend/relative didn’t need or want to use technology to support communication.

See Appendix 2 for more information and links to these resources.

These responses show how technology can enhance access to activities of daily life (Kelly et al. 2015).
Do you use any accessibility functions on your device?

People with aphasia

You said you also use the iBook app with the accessibility feature ‘speak screen’

Speech & Language Professionals

You said you find accessibility features work well with:
- apple notes app
- e-mail
- news

The most commonly used accessibility functions were:
- text to speech
- calender
- speech to text
- reminder
- drawing

These were being used by just over a third of all respondents. All accessibility functions listed were being used to some extent.
People with aphasia
You also use:
- Talk Path News
- Google search

All the sources of information listed, were used to some extent by all groups.

Friends and family
You also use:
- Australian Aphasia Association
- Communicate WA
- Voices of America

Speech & Language Professionals
You also use:
- One skill videos
- NZ Aphasia Association
- New Zealand Speech Therapy Assoc
- IPA (Instituto Português da Afasia)
- Aphasia Access
- Aphasia United
- Different Strokes
- Enableme
- Newsy
- Tex X
- News in levels
- Map apps
- News apps (with filters)

Again, these results suggest people with aphasia are preferring general apps that support life participation over specific aphasia ones.

Friends and family most commonly sourced information via social media.

The popularity of social media as a source of information amongst friends and family may suggest this group is looking for support/validation of their experiences with others, as much as basic facts.

Westerman et al (2014) stress the importance of validating the credibility of information sourced online and suggest the responsibility of this lies with the information consumer, not the provider.
According to Statista, of the 7.6 billion people in the world, 4.2 billion were active internet users in October 2018 and 3.4 billion of these use social media.

Although the following results are biased towards social media users because of how the data was collated, these global statistics show social media is very much part of the majority of our lifestyles.

Across all three groups the most respondents said they used social media.

Of the sites listed the Aphasia Recovery Connection (ARC) was the most popular site, followed by the National Aphasia Association and Aphasia Friendly Resources. Again, data biased by collection methods.

See Appendix 3 for more information and links.
Sixty Eight percent of speech and language therapists reported using social media for their own clinical professional development but only 44% said they would recommend social media sites to people with aphasia/their friends/family. Reasons cited included information governance and not having thought of it.

See Appendix 3 for more information and links.
Aphasia is linked with reduced social networks, isolation, loneliness. Simmons-Mackie (2018) White Paper reports 20% of people with aphasia have no friends six months post onset and that reduced social contact has a significant impact on health and longevity (equivalent to smoking 15 cigarettes a day).

Fotiadou, D. et al (2014) and (Northcott 2016) completed a systematic review of blogs written by people with aphasia, to explore the impact of aphasia on social relationships. Social networks of people with aphasia were found to be negatively affected, and suggested social media should be explored as a platform to support the maintenance of people with aphasia’s social network.

These results suggest social media has a role play in augmenting isolation and acting as a platform for networking with friends and family, finding support, advice and information.

A few studies have explored the barriers to accessing social media (Roper et al 2018, Baier et al 2017). This survey shows people with aphasia, their freinds/ family and speech and language therapists are using social media to facilitate interactions with and about aphasia and that their are mutiple benefits from doing this.

Futher data from Statista shows the age range and topic diversity of social media use in the general Uk and US population:

Supporting access to this mainstream communication platform should be part of a speech and language role. Baier (2017), de Sandt-Koenderman (2011) emphasise the need for training/ support to facilititate access to this type of technology
What barriers to using technology do you experience?

People with aphasia:
- Fatigue
- Stress
- Problem solving when things go wrong
- Apps not pitched at right level
- Difficulty of use

Friends and family:
- Writing skills
- Apps that require voice
- Remembering passwords
- Need assistance to navigate
- Few aphasia apps designed for children
- Little support
- No how to use manual with apps
- No good resources for finding things out

Others:
- Availability of apps/ tech
- Awareness
- Difficulty of use
- Knowledge
- Lack of training

Speech & Language Professionals:
- Time
- Motivation
- Cognitive/ motor/ visual skill
- Older ppl unfamiliar with tech
- Knowledge-Keeping upto date
- Difficulty of use
- Cost/ funding for tech/ funding for apps on pwa own device
- It support/ consent to use tech
- Wi-Fi firewall, security
- IG support/ consent to use tech
- Limited ability to personalise apps
Knowledge and money were the greatest barriers to accessing technology as identified by all groups. Wi-Fi access also remains a significant issue for speech and language professionals.

Resources for finding out about apps/software include:

- The website: aphasia software finder http://aphasiasoftwarefinder.org
- App and google play stores using search terms
- Appendix 1 and 2 of this document


A number of speech and language professionals in this survey advocated having a computer/technology lead in their teams to help with addressing barriers and promoting knowledge.

Several people with aphasia and their friends and family requested written accessible guidelines for using specific technologies and apps. Some app developers do provide these e.g. Proloquo2Go, but many currently don’t.

Cognition, visual, motor skills, stress and fatigue were also all recognised as factors compromising access for people with aphasia, as well as, unfamiliarity with using technology prior to becoming aphasic.

Finding the right app pitched at the right level, ability to personalise apps, remembering passwords were also mentioned as limitations.

Professionals in the ‘other category’ reported difficulty knowing what was available and lack of access to training on using technology to support communication as key barriers.
Appendices:

The software and apps listed here were all recommended by the survey participants. The evidence base behind these apps has not been explored by the authors and they are not specifically endorsed by the authors. Where possible we have added links to relevant research.

This is not a conclusive list. To source more information, or explore further try software search tools such as:

My Therappy: https://www.my-therappy.co.uk/medical-condition/stroke-brain-injury

Accessibly designed site listing apps reviewed by NHS specialists including those to help recovery following a Stroke or Brain Injury.

Aphasia Software Finder: https://www.aphasiasoftwarefinder.org

Where possible we have provided links to the developers website and an indication of cost:

- $$$$$ $1000+
- $$$$$ $500 - 1000
- $$$$$ $100 - 500
- $$$ $50-100
- $$ $25-50
- $ $1-25

We have provided this information to the best of our knowledge, however, if you find any of the information on these pages to be incorrect and would like to request amendments please contact Kathryncann@nhs.net
## Appendix 1a: Software used in therapy

<table>
<thead>
<tr>
<th>Software</th>
<th>Website</th>
<th>Description</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constant Therapy:</strong> <a href="https://www.constanttherapy.com">https://www.constanttherapy.com</a></td>
<td>Available as an app or software package. Over 100,000 exercises, 10 difficulty levels, to practice speech, language, cognition, memory, reading, attention and comprehension skills with more than 75 task categories. Can be personalised. Provides progress reports against goals.</td>
<td>Free trial</td>
<td>$ but upto 3 free games/day. signup required</td>
</tr>
<tr>
<td><strong>Bungalow:</strong> <a href="https://www.bungalowsoftware.com">https://www.bungalowsoftware.com</a></td>
<td>Available as an app or software package. Twenty Programmes Over 100,000 exercises for speech, language, cognition.</td>
<td>Free trial</td>
<td>$ but upto 3 free games/day. signup required</td>
</tr>
<tr>
<td><strong>REACT 2:</strong> <a href="https://www.react2.com">https://www.react2.com</a></td>
<td>9000 graded exercises covering auditory processing, visual processing, semantics, memory / sequencing and life skills. Exercises can be set remotely Provides progress reports against goals. Runs on desktop and tablet.</td>
<td>$ subscription cancel any time</td>
<td>$ but upto 3 free games/day. signup required</td>
</tr>
<tr>
<td><strong>Step by Step:</strong> <a href="https://aphasia-software.com">https://aphasia-software.com</a></td>
<td>StepByStep aphasia therapy has been developed to allow a range of language skills to be practised. Each of these skills can be practised in isolation, with the objective being that a core set of words are targeted for therapy in the MyWords program, which combines all of the other programs. Tablet/ touch friendly. Voice recognition.</td>
<td>$ subscription $$$$ license for life</td>
<td></td>
</tr>
<tr>
<td><strong>Lumosity:</strong> <a href="https://www.lumosity.com">https://www.lumosity.com</a></td>
<td>Available on computer, ipad and android. Brain teaser games targeting cognition and language + mindfulness for relaxation.</td>
<td>$ but upto 3 free games/day. signup required</td>
<td></td>
</tr>
<tr>
<td><strong>Neolexon:</strong> <a href="https://neolexon.de/">https://neolexon.de/</a></td>
<td>Thousands of exercises for understanding, reading and writing, fully personalisable, remote set up. Scientifically based therapy, neolexene is certified as a medical device. German language app</td>
<td>various subscription options</td>
<td></td>
</tr>
<tr>
<td><strong>Look and Learn:</strong> <a href="https://thinksmartbox.com/product/look-to-learn/">https://thinksmartbox.com/product/look-to-learn/</a></td>
<td>Activities to support getting used to using eyegaze technology</td>
<td>$$$$</td>
<td></td>
</tr>
</tbody>
</table>
EVA Park is a multi-user online virtual world that gives people with aphasia unique opportunities to practise their speech and establish social connections. EVA Park contains a variety of virtual locations including shops, restaurants, a hairdressers, houses, a bar and disco, together with fun and fantastical elements. Users are represented by personalised avatars and communicate by talking to each other.


<table>
<thead>
<tr>
<th>Parrot Software - <a href="https://www.parrotsoftware.com/index.html">https://www.parrotsoftware.com/index.html</a></th>
<th>Personalised programmes for aphasia with feedback on progress. Includes exercises for cognitions, language and speech.</th>
<th>Free trial $ subscription $$$$$ software packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>GeST -</td>
<td>Computer gesture therapy tool targeting skills with using gesture and naming. Video demo</td>
<td>Currently in research phase Not currently available.</td>
</tr>
</tbody>
</table>

Touch Type Read and Spell TTRS: http://www.readandspell.com/about

TTRS is modular in design and contains 24 levels with 31 modules in each level. TTRS uses a multi-sensory approach to repetition learning. Focused on reading and spelling skills also covers maths and memory. Not designed specifically for aphasia.

| Touch Type Read and Spell TTRS: http://www.readandspell.com/about | TTRS is modular in design and contains 24 levels with 31 modules in each level. TTRS uses a multi-sensory approach to repetition learning. Focused on reading and spelling skills also covers maths and memory. Not designed specifically for aphasia. | $ subscription |

SWORD: https://www.propellertherapy.com/store/c7/SWORD.html

SWORD is software designed for the treatment of word production difficulties in APRAXIA and APHASIA. Contains 70 highly functional words with associated images, audio recording of the word and a video of a speaker producing the word.

| SWORD: https://www.propellertherapy.com/store/c7/SWORD.html | SWORD is software designed for the treatment of word production difficulties in APRAXIA and APHASIA. Contains 70 highly functional words with associated images, audio recording of the word and a video of a speaker producing the word. | $$$ subscription |

Aphasia Therapy online: http://www.aphasiatherapyonline.com/main.html

Exercises for listening, reading, writing and spelling.

| Aphasia Therapy online: http://www.aphasiatherapyonline.com/main.html | Exercises for listening, reading, writing and spelling. | free |

Power Point

Power point has capacity to develop quizzes that can be used as basis for aphasia exercises. See https://forms.office.com

| Power Point | Power point has capacity to develop quizzes that can be used as basis for aphasia exercises. See https://forms.office.com | |

---

**Eva Park** - https://evapark.city.ac.uk


**GeST** -

**Touch Type Read and Spell TTRS:** http://www.readandspell.com/about

**SWORD:** https://www.propellertherapy.com/store/c7/SWORD.html

**Aphasia Therapy online:** http://www.aphasiatherapyonline.com/main.html

**Power Point**
### Tactus Therapy: [https://tactustherapy.com](https://tactustherapy.com)
**Large range of apps** relevant to aphasia. Available on App store and Google Play. Some available in multiple languages.

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | lite versions<br>$ single app<br>$$$ bundle apps |}

Targetting apraxia/ dyspraxia - The aim of this app is to increase the intensity of treatment for people with apraxia, combining J. Rosenbek’s integral stimulation approach with B. Hill’s carrier phrase facilitation drills. Available in Australian/ English/ US accent.

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | lite versions<br>$ single app<br>$$$ bundle apps |}

### Aptus: [http://aptus-slt.com](http://aptus-slt.com)
**Large range of apps** relevant to aphasia/ dysarthria/ reading/ writing/ understanding/ naming/ inference etc. Available on App store and Google Play.

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | lite versions<br>$ single app<br>$$$ bundle apps |}

### Cue Speak: [http://cuespeak.com](http://cuespeak.com)
Highly customisable exercises relevant to aphasia/ dyspraxia/ cognition, all within a single app. Available on App store. Only for iPad

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | Voluntary subscription |}

### Phrasal Verbs:

- **Phrasal Verbs: Explanations and practice tests**
  A phrasal verb is a combination of a verb with a preposition or particle. Also see Phrasal Nerds and Phrasal Rings. Link for [reviews](#).

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | $ |}

### Farmville:
Build your own farm. Play with friends - used for conversation practice

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | |}

Flash card app, includes voice recorder and capacity to create your own flash cards. 40 flash cards. Provides feedback reports. Available on app store.

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | Lite version<br>$ free |}

### Lingraphia: [https://www.aphasia.com/smalltalk-apps/](https://www.aphasia.com/smalltalk-apps/)
Range of apps including articulation, numbers, common phrases. Uses video demo. Available on app store.

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | |}

### Speak Up for Parkinson’s: [https://itunes.apple.com/gb/app/speak-up-for-parkinsons/](https://itunes.apple.com/gb/app/speak-up-for-parkinsons/)
Although designed for Parkinson’s, also useful for dysarthria. Focus on inc volume. Exercises at word - conversation level

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
</table>
| Free  | |}

### Elevate: [https://www.elevateapp.com](https://www.elevateapp.com)
35+ games for reading/ writing/ spelling. Performance tracking. App store and Google play

<table>
<thead>
<tr>
<th>Price</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ subscription</td>
<td></td>
</tr>
</tbody>
</table>
Evidence for outcomes following use of aphasia apps: see discussion page page 10

<table>
<thead>
<tr>
<th>App Name</th>
<th>Website/Details</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain Yoga</td>
<td><a href="https://www.elevateapp.com">https://www.elevateapp.com</a></td>
<td>free $ in app purchases</td>
</tr>
<tr>
<td>Chain of thought</td>
<td></td>
<td>free $ in app purchases</td>
</tr>
<tr>
<td>4 pics 1 word</td>
<td></td>
<td>free $ in app purchases</td>
</tr>
<tr>
<td>Look and Learn</td>
<td><a href="https://thinksmartbox.com/product/look-to-learn/">https://thinksmartbox.com/product/look-to-learn/</a></td>
<td>$$$  free $ in app purchases</td>
</tr>
<tr>
<td>Word Vault</td>
<td><a href="https://www.home-speech-home.com">https://www.home-speech-home.com</a></td>
<td>free $ in app purchases</td>
</tr>
<tr>
<td>STAPP</td>
<td>Speech and language exercises in Dutch. Available in app store.</td>
<td></td>
</tr>
<tr>
<td>Elllo</td>
<td><a href="http://www.ello.org">www.ello.org</a></td>
<td>free</td>
</tr>
<tr>
<td>Lyrics Training</td>
<td>Aimed at ppl learning English - learn language through music. App store and google play. Available on google play.</td>
<td>free $ in app purchases</td>
</tr>
<tr>
<td>Cambridge English</td>
<td><a href="https://www.cambridgeenglish.org/learning-english">https://www.cambridgeenglish.org/learning-english</a></td>
<td>free</td>
</tr>
</tbody>
</table>

Nakano D (2015) **Elevate Effectiveness Study**

Eleven puzzle games to train your memory, vocabulary, numeracy, spatial ability and pattern matching. No timer pressure, no high scores. App store and google play.
## Appendix 2a: Software to support communication

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedicated hardware and software includes voice output, environmental control, eye gaze, symbol based software (e.g. snap + core, look and learn). Runs mainly on windows but some products available for Mac/ iOS. Support and training available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Penfriend:</strong> <a href="http://www.penfriend.biz">http://www.penfriend.biz</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Penfriend offers a powerful word predictor with screen reader, text magnification, and on-screen Keyboards in many languages. There are versions for Windows desktop installation and portable USB drives. It works in many languages.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Grammerly:</strong> <a href="https://www.grammarly.com/">https://www.grammarly.com/</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammer checker for desktop and tablet.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Boardmaker:</strong> <a href="https://www.tobiidynavox.com">https://www.tobiidynavox.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Create picture based communication boards. 44 languages. Desktop and tablet. From Tobi dynavox.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Nova chat:</strong> <a href="https://www.liberator.co.uk/products/communication-aids/nova-chat-range">https://www.liberator.co.uk/products/communication-aids/nova-chat-range</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware communication device with symbol based chat software.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>OCR scanner</strong> <a href="https://mashtips.com/ocr-scanner-ios-apps/">https://mashtips.com/ocr-scanner-ios-apps/</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal Character Recognition hardware/ software/ apps recognises paper based (inc whiteboards) text and images and converts to digital</td>
</tr>
</tbody>
</table>
## Appendix 2b: Links/ descriptions for apps that support communication

<table>
<thead>
<tr>
<th>App Name</th>
<th>URL</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>$$ subscription</td>
</tr>
<tr>
<td>Pictello</td>
<td><a href="https://www.assistiveware.com/products/pictello">https://www.assistiveware.com/products/pictello</a></td>
<td>Build stories with photos, videos and text to speech. Available on iOS in multiple languages.</td>
<td>$$ single app</td>
</tr>
<tr>
<td>Notions</td>
<td><a href="https://www.notion.so">https://www.notion.so</a></td>
<td>Tools to support planning and organisation. Includes calender and ability to collaborate with others. Available for desktop and iOS and android.</td>
<td>Free - $</td>
</tr>
<tr>
<td>ClaroRead</td>
<td><a href="https://www.clarosoftware.com/portfolio/">https://www.clarosoftware.com/portfolio/</a></td>
<td>Read any on screen text outloud - PC, Mac, iOS, android. Claro read pro also includes spell check/ word prediction.</td>
<td>$$$$$</td>
</tr>
<tr>
<td>Flip writer</td>
<td><a href="https://www.flipwriteraac.org">https://www.flipwriteraac.org</a></td>
<td>Flips inputted text to be read by listener. Includes word prediction, text to speech and speech recognition.</td>
<td>$$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>free</td>
</tr>
<tr>
<td>Whiteboard</td>
<td><a href="https://awwapp.com">https://awwapp.com</a></td>
<td>Drawing space for PC/Mac/tablet, includes PDF upload. Board are deleted after 2 hours in free version but save unlimited numbers in premium version. Can collaborate with others. Includes voice call facility.</td>
<td>Free</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Listening Library</td>
<td><a href="https://www.booksontape.com/listening-library/">https://www.booksontape.com/listening-library/</a></td>
<td>Thousands of audiobooks to download.</td>
<td>Varies</td>
</tr>
<tr>
<td>Doodle buddy</td>
<td><a href="https://sites.google.com/site/hpusoeit/doodle-buddy---handrigan">https://sites.google.com/site/hpusoeit/doodle-buddy---handrigan</a></td>
<td>Drawing app. Can import photos and email doodles. iOS and android.</td>
<td>Free</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>in app purchases</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>Text based, can add images. Organise into folders. Integral app on most devices</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td><strong>Map apps</strong></td>
<td>Search for anywhere with name or postcode, map/ satellite views. Real time directions to destination drive/walk/public transport. Shows nearby sites of interest - shops/ bank etc. Integral app on most devices</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td><strong>Google images</strong></td>
<td>Google search facility for images</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td><strong>Speaking E-mail</strong></td>
<td>Read emails outloud. Dictate emails. Fully voice controlled. Available in app store.</td>
<td>$ in app purchases</td>
<td></td>
</tr>
<tr>
<td><strong>Compass</strong></td>
<td>Symbols based communication from Tobi Dynavox. Available for windows and iOS. Research based.</td>
<td>$$$</td>
<td></td>
</tr>
<tr>
<td><strong>Pictello</strong></td>
<td>Create and share visual stories and schedules. Add your own pictures, videos and recordings. iOS</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>Touch Chat HD</strong></td>
<td>Symbol based communication. Fully customisable page sets/ buttons/ messages. Spanish and English. iOS</td>
<td>$$$</td>
<td></td>
</tr>
<tr>
<td><strong>Scene and Heard:</strong></td>
<td>Communicate by visual scenes. Upload picture/ photo and hotspot items within in to speak message on touch. Also create visual timetables and printable communication books Available in English German/ Danish/ Swedish/ Icelandic. From Therapybox. On iOS</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>Speak for yourself</strong></td>
<td>Word and symbol based app (11000 symbols, 14000 words) iOS</td>
<td>$$$</td>
<td></td>
</tr>
<tr>
<td><strong>Chatter boards</strong></td>
<td>Fully customisable communication boards with vocabulary, images and sentence building capacity. Supports text and image only buttons. Can upload photos iOS</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>Voice recording apps:</strong></td>
<td>Often free with device or download from google play/ app store</td>
<td>free</td>
<td></td>
</tr>
<tr>
<td><strong>Parkinson's Easy Call:</strong></td>
<td>Enables phone calls to be made with a single touch to the smartphone</td>
<td>free</td>
<td></td>
</tr>
<tr>
<td><strong>Leeloo AAC:</strong></td>
<td>Designed for autistic kids. Symbols based words and phrases. Google Play</td>
<td>free</td>
<td></td>
</tr>
<tr>
<td>Product Name</td>
<td>Description</td>
<td>Pricing</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>---------</td>
<td></td>
</tr>
</tbody>
</table>
| **Proloquo for text** https://www.assistiveware.com/products/proloquo4text | Text to speech app with predictive words | $$$$
| **Co writer** https://learningtools.donjohnston.com/product/cowriter/ | Predicts words and phrases in real time. Includes speech recognition. Facility to record amount of time spent on app. | Free trial $ subscription
| **Seeing AI** https://www.microsoft.com/en-us/seeing-ai | Read text (inc handwritten), describes scene from camera. iOS | Free
| **Talk and photos** | Numerous apps on google play and app store - recorded messages can be added to photos e.g. Face Talker, Chatterpix, Speakpic, Photo Talk | Free In app purchases
| **All about me - story book** | Create your own personal information storybooks by using your own custom photos, text and audio. | $
| **Email and notes + accessibility** | Use accessibility features in your device settings/ voice transcription | Free
| **Chattable** | Grid and scene symbol based AAC. English, from Therapy Box Ltd | $$$
| **Find a Friend** | The “Find My Friends” app is a location sharing tool. It allows people to locate friends and family using their iPhone, iPad or iPod touch. The app uses a device's GPS capabilities to “find” other friends using the app. | Free
| **Read2go** | Accessible e-book reader. Full control over visual choices for font size and color, background and highlighting color, and text-to-speech preferences. Read2Go features word-by-word highlighting for multi-modal reading. | $
| **Meditation** | Numerous available across all platforms. Eg: Headspace guided meditation, Calm, Zen, Stop, breathe and think. | Free

---

**Note:**
- Pricing information is as of the last update and may change. Please check official websites for the latest details.
- Free trail or subscription fees are subject to change.
- In app purchases and additional fees may apply for some features.
<table>
<thead>
<tr>
<th><strong>Sprint IP relay</strong></th>
<th><a href="https://www.sprintrelay.com/sprintiprelay">https://www.sprintrelay.com/sprintiprelay</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Text message to operator who speaks your message to listener and vice versa</td>
<td>$$$$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Grammerly</strong></th>
<th><a href="http://www.grammerly.com">www.grammerly.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic grammer checker for mobile and desktop.</td>
<td>Free</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Predictive texting</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>On all texting apps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Google Assistant/ Siri</strong></th>
<th><a href="https://www.apple.com/siri/">https://www.apple.com/siri/</a>  <a href="https://assistant.google.co">https://assistant.google.co</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal assistants on mobile and some desktop devices. Voice activated.</td>
<td>Free on device</td>
</tr>
</tbody>
</table>

Send text messages, make phone calls, search internet, set alarms/ calendar/ reminders, play music, plan journeys.
### Appendix 3: Social Media

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aphasia Recovery Connection</strong></td>
<td>Support network and information. Separate closed groups for people with aphasia and their carers.</td>
</tr>
<tr>
<td>ARC Aphasia Friends and carers.</td>
<td></td>
</tr>
<tr>
<td>ARC Aphasia Recovery Connection</td>
<td></td>
</tr>
<tr>
<td>@ARCaphasia</td>
<td></td>
</tr>
<tr>
<td><strong>Aphasia Friendly Resources</strong></td>
<td>Aphasia awareness and information - links to free resource website: <a href="http://www.aphasiafriendly.co">www.aphasiafriendly.co</a></td>
</tr>
<tr>
<td>@AphasiaFriendlyResources</td>
<td></td>
</tr>
<tr>
<td><strong>National Aphasia Association</strong></td>
<td>Information and advice. US based. <a href="https://www.aphasia.org">https://www.aphasia.org</a></td>
</tr>
<tr>
<td>@NatAphasiaAssoc</td>
<td></td>
</tr>
<tr>
<td><strong>Primary Progressive Aphasia</strong></td>
<td>Advice and support community for PPA</td>
</tr>
<tr>
<td>Primary Progressive Aphasia</td>
<td></td>
</tr>
<tr>
<td><strong>Aphasia Re-Connect</strong></td>
<td>Long term peer support network, Greater London</td>
</tr>
<tr>
<td>@AphasiaReConnec</td>
<td></td>
</tr>
<tr>
<td><strong>Aphasia FYI</strong></td>
<td>Support/ advice community, run by person with aphasia.</td>
</tr>
<tr>
<td>@AphasiaFYI</td>
<td></td>
</tr>
<tr>
<td><strong>Aphasia Life</strong></td>
<td>Practical solutions to daily problems. <a href="https://aphasialife.org">https://aphasialife.org</a></td>
</tr>
<tr>
<td>@AphasiaLife</td>
<td></td>
</tr>
<tr>
<td><strong>Cornwall Stroke &amp; Aphasia Network</strong></td>
<td>Closed group for support and advice for stroke survivors with aphasia in Cornwall.</td>
</tr>
<tr>
<td><strong>Stroke Families Connect</strong></td>
<td>Closed group for support/ advice. Run by wife of-stroke survivor.</td>
</tr>
<tr>
<td><strong>Aphasia Access</strong></td>
<td>Resource for healthcare and community providers, educators, and others who embrace the Life Participation Approach to Aphasia.</td>
</tr>
<tr>
<td>@AphasiaAccess</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3: Social Media

Aphasia United

Information on current events/research/info in aphasia

Eva Park

Virtual environment for people with aphasia.
evapark.co.uk

Luna

Project exploring narrative in aphasia. Based at City Lit University, funded by Stroke Association.

Inca Project

Researching tools to support inclusive digital content for people with aphasia

British Aphasiology Society

Promotes the study of aphasia and development of clinical services.

Inca Project

Researching tools to support inclusive digital content for people with aphasia

Aphasia Choirs Go Global

Aphasia Choirs Go Global aims to link choirs around the world who cater for people with neurological speech and language difficulty. It is a group to share news, research, and day to day issues.

Australian Aphasia Association

A not-for-profit organisation supporting people with aphasia, their family and friends.

http://www.aphasia.org.au

Aphasia Hope

To educate and inform people about the facts, advances and resources surrounding aphasia.

SW Aphasia CEN

Clinical Excellence Network for S/LT’s with special interest in aphasia. South West UK.

Aphasia Research Lab

The primary goal of the lab is to understand language processing and communication following a brain damage. Research in the lab makes use of Neuroimaging, neurolinguistic, psycholinguistic and
References


Caitlin Brandenburg, Linda Worrall, David Copland, Emma Power & Amy D. Rodriguez (2016) The development and accuracy testing of CommFit™, an iPhone application for individuals with aphasia, Aphasiology, 30:2-3, 320-338, DOI: 10.1080/02687038.2015.1028329


Dept of work and pensions (2014) The use of social media for research and analysis


