# Assistive Technologies for Individuals with Diverse Abilities

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# **Music Listening Devices**

Many of the clients and their caretakers that I met this past week have expressed interest in music players that are easy to use for the clients, giving them independence in this aspect of their lives. Simple devices such as speakers and apps may prove effective in giving them this independence. These apps and speakers are very simple, featuring a few large buttons or large pictures on the app for music play. After some searching, I have found that the following devices and apps may prove effective.

- CanTunes app for the Apple iPad (not available for Android)
  - o Free app from the Apple App Store
  - Developer website and factsheet:
     <a href="https://www.canassist.ca/EN/main/programs/technologies-and-devices/test-1/cantunes.html">https://www.canassist.ca/EN/main/programs/technologies-and-devices/test-1/cantunes.html</a>
  - This is a simple app that automatically imports the client's iTunes library and displays it
    in an easy to understand page, featuring only the album art in picture form. The client
    can simply tap the album art they desire, and the music will start playing.
  - This could be used in conjunction with Bluetooth speakers so that music can be played from a speaker rather than the device (which may have poor audio quality or volume range).
  - Below is a picture of what the app looks like, with four albums loaded. The album art is shown in circles. The album name is shown in this picture, but may be taken off in the settings option of the app.



https://www.canassist.ca/EN/main/programs/technologies-and-devices/test-1/cantunes.html

- Bluetooth/MP3 Audio Centre
  - o \$149.95
  - Product link: https://enablingdevices.com/product/bluetoothmp3-audio-center/
  - This is a speaker that features 5 large buttons for easy use. The buttons are for power, volume, play, play next/back, and mode.
  - To play music, the client can simply press the large green "play" button.
  - The device works with Bluetooth, USB, and AUX cords, making it highly adaptable for use with any mobile music device.
  - This would be especially useful for Bluetooth, where it would not matter where the iPad/tablet/phone/iPod was located in the house, but would still play music when prompted.
- iPad/iPod/Smartphone/Tablet Cordless Music Box
  - o \$174.00
  - o Product link: <a href="https://store.rjcooper.com/collections/music/products/smartphone-tablet-cordless-music-box">https://store.rjcooper.com/collections/music/products/smartphone-tablet-cordless-music-box</a>
  - Bluetooth speakers for your iPad/tablet/smartphone/iPod
  - Simple design, featuring 2 or 3 coloured buttons for play. Devices can be purchased to feature either 2 or 3 buttons, and can be purchased to be switch-adapted if needed.
  - Buttons are for play/pause, skip forward, and may include skip backward.
- Simple Music Player Red
  - o \$199.99
  - o Product link: <a href="https://www.cdsboutique.com/en/le-simple-music-player-rouge.html">https://www.cdsboutique.com/en/le-simple-music-player-rouge.html</a>
  - Simple stereo that can hold up to 40 songs (songs must be downloaded from a computer or iOS device through USB cable)
  - Originally designed for seniors with severe dementia and motor disabilities, but applicable for adults with developmental disabilities
  - Features a tab that may be lifted to start playing music
  - Very intuitive and easy to use

## **Smart Home Technology**

The advent of "smart" technology has transformed the technological world, opening up many applications for daily life and home functions. Devices such as the Amazon Echo and Google Home have the capability of transforming the traditional analog home into a fully digitized home that may be controlled through voice or through their respective apps. The Apple Home technology is rapidly being outpaced by Amazon and Google, and has fallen by the wayside with many smart home technologies not being applicable to the Apple framework. There are two main companies that have monopolies on this technology: Amazon and Google. These companies are capable of controlling a number of appliances and devices, which must be built to be compatible with each smart technology. A full list of compatible smart home devices can be found in an article by consumer reports. There are some similarities and differences between the functions of Amazon Echo, Google Home. They both require a smartphone or tablet upon initial setup, and can both be controlled by the smartphone or tablet. They also respond to voice commands. The devices are generally "asleep" by default – that is, they do not respond to or record anything unless prompted by the phrase "Alexa", or "Hey Google", respectively. They also have a lot of similar functions, such as voice calling, music playing, and controlling smart home devices. However, the two both have functions that may differ. Full descriptions of each service are explained below.

#### **Amazon Echo**

Nicknamed "Alexa", this device uses the existing Amazon framework that includes Audible (audiobooks), Amazon Music, Amazon.com, and Amazon-compatible devices to assist users. There are many different Amazon Echo devices that have become available, such the Echo Dot (a mini version that has fewer features), the original Echo, the Echo Show (features a screen for videochatting and pictures), the Echo Plus (a larger version of the original Echo with better speakers for music), and even the Echo Look (enabled with a camera for fashion advice and for quick online shopping). The most common device is the original Amazon Echo, but multiple devices may be purchased and used in the same household for different functions, and may also be linked for use as an intercom system or for doing different functions in different rooms.

Alexa must be set up using a smartphone or tablet with the Amazon Echo app. Some features, such as music, may require paid subscription fees. Amazon Echo can only work with compatible devices — if a smartphone or tablet it too old, the app will not work and therefore setup of the Amazon Echo will not be successful. Control of the Amazon Echo/Alexa can be done vocally or through the Amazon Echo app for smartphones/tablets. Voice generating technology, such as through eye tracking devices, can be used to vocally control the Amazon Echo.

Despite this, the Amazon Echo/Alexa has many valuable skills that can be used to control a home, control entertainment, and learn information. For this reason, this technology has proven helpful for adults with diverse abilities.

Common functions and skills include:

- Music/Entertainment music plays through compatible applications such as Spotify, Amazon Music, Pandora, TuneIn, iHeart Radio Player, and SiriusXM Radio. A paid subscription may be required for use of these applications.
- Calling and Messaging Alexa may be used to send a voice, video or text message to another
  phone or tablet. It is important to note that calling may only be done if the smart device is
  connected (through wifi) to a mobile smartphone with the Amazon Echo/Google Home app it
  cannot be connected to a house phone. However, recent app updates have started allowing
  Alexa to make phone calls on tablets.

https://www.theverge.com/2018/3/12/17109418/amazon-alexa-calls-messages-tablets-fire-ipads

- News and Information Alexa can tell you about the weather, the day's news, and more simply
  by saying "Alexa, tell me about my day", or specially "Alexa, what's the weather forecast", or
  "Alexa, what's today's news?" Alexa may also answer questions or find answers for you. In
  Canada, she uses CBC network to tell the news and weather.
- Questions and Answers Alexa can find local businesses and restaurants, look up Wikipedia
  articles, and search the internet. This is a new feature, previously only the Google Home system
  was able to search the internet using it's Google search engine, but recently Amazon has been
  able to search the web. Alexa can also do simple math problems, define words, and spell words
  out for you when prompted.
- Help Around the House The Amazon Echo can be used as a timer, alarm clock, daytime schedule, calendar, kitchen help device to search for recipes and convert units, and may also be used to look for common restaurant menus. For example, you can say "Alexa, remind me to call a plumber in half an hour", or "Alexa, what are some good chicken recipes", or "Alexa, wake me up a 8 am".
- Smart Home This is a function that has many applications for adults with diverse abilities.
   Amazon has many compatible devices, such as smart switches and smart appliances. Smart refrigerators, smart ovens, smart lights, smart air conditioners and thermostats, and smart locks are flagship developments that can make the lives of adults with diverse abilities easier and more fulfilling. They can dramatically increase independence and control over the homes of these adults, and prove useful for them and their caretakers.
- Fun and Games The Amazon Echo comes equipped with numerous games and challenges that can be played by one player or with a group. These include Trivia, Jeopardy, 20 Questions, and many others. The games may be played both by speaking to the Echo, or using apps on a tablet or smartphone, or by buying coloured buttons for group play.
- Shopping Since Alexa runs off the Amazon framework, you can tell Alexa to buy items for you
  and have them paid for on your Amazon account and then shipped to your home. Amazon Echocompatible appliances can also do this automatically when they sense that the user is running
  low on something such as laundry detergent. This feature can also be used to find deals on
  Amazon.com, and to generate shopping lists.
- Skills Amazon Echo/Alexa has over 400,000 skills that may be called upon by the user, including ordering pizza from Dominos, finding out fun facts about history, telling jokes, and even getting Alexa to sing for you. These skills can be explored and activated on the Amazon Echo app for smartphones/tablets, or online.

For an academic look at Amazon Alexa, how it works, and accompanying privacy concerns, check out this free article. The company website is an additional resource for how the Amazon Echo works and its many functions.

Prices for the Amazon Echo vary. The original Amazon Echo can be purchased for \$129.99 on the <u>Amazon website</u>. The smaller Amazon Dot is about half that price at \$69.99 on the <u>Amazon Website</u>. The pricier Echo Plus sells for \$199.99 on the <u>Amazon website</u>.

The rest of the Echo devices can be purchased somewhere within that price range.

#### **Google Home**

The Google Home is Google's answer to the Amazon Echo. It is small, with well-built speakers and runs off the Google framework. It comes in three sizes — Mini, original, and Max. The original can come in different colours to fit in with the décor of the room it is placed in. Like the Amazon Echo, it must be set up using the Google Home app on a mobile device on the same wi-fi network. After setup, it can also mostly be controlled using either the users voice or the Google Home app. Google Home has many functions, similar to the Amazon Echo. Common functions:

- Music The Google Home can play music using Google Play music and through Spotify. This may
  be free or through a paid subscription, with paid subscription users being able to use more
  functions of each music service. It can also play the News, Podcasts, Audiobooks, and radio. The
  advantage of the Google Home in this regard is that it can use free services, whereas the
  Amazon Echo requires paid subscriptions.
- Calling Google Home makes calls directly from the device, rather than through a cell phone or app. Those receiving calls see only that it is from a "private" or "anonymous" caller. The user may import the existing contacts from their cell phone or tablet, which will make calling a specific person easier. For example, if a user had their mother as a contact in their phone or tablet, they can import the contacts into the Google Home using the Google Home app, and have that stored for as long as they have the device. Whenever they want to call a contact, they can simply say "Hey Google, call mom", and Google Home will call their mother. The only drawback is that Google Home is incapable of receiving calls, which may be frustrating for users who do not have regular access to a phone.
- News and Information the Google Home can be used to find out the news of the day, the
  weather, and even listen to local radio. All this can be done by saying "Hey Google", followed by
  the prompt.
- Questions and Answers Google Home uses the Google search engine to answer questions and find information. It can provide many details about specific things, searching the web for full answers to the questions it is asked. It also uses the existing contact information on Google to call specific businesses and organizations when prompted all the user has to say is "Hey Google, call Inclusion Kamloops", and the device will call Inclusion Kamloops even if it has never called that number before or the user doesn't know the phone number. Google Home can also search the web for recipes, language translations, definitions, math calculations, and sports news, unit conversions, and a myriad of other functions. The Google search engine has many applications, all of which are accessible using the Google Home.
- Planning and Organizing Google Home can create calendar schedules, shopping lists, reminders, alarms, to-do lists, find traffic and travel information, and can be used as a timer in the kitchen.
- Entertainment Google Home can be used to control televisions and speakers using Google's Chromecast technology. Chromecast is a small device that plugs into a television, and allows users to stream movies, television, and music from their laptop to the TV. If a user has both Chromecast and Google Home, the user only has to say "Ok Google, play \_\_\_\_\_ on the \_\_\_\_ TV". If the user wanted to watch the movie Tangled on their living room TV, they would say "Ok Google, play Tangled on the living room TV", and the movie would start playing. If multiple TV's are enabled with Chromecast, Google Home can play music (or movies) on multiple ones at the same time, giving homogenous music distribution throughout the entire home.
- Smart Home Google Home has many compatible smart home applications available. It can control lighting, the thermostat, and smart plugs and switches. All this can be controlled by

- saying "Ok google, turn on the lights", "Ok Google, turn the thermostat up to 75 degrees", or "Ok Google, turn on the fan". This can also be controlled on the Google Home app.
- Games As with the Amazon Echo, Google Home has many single and multiplayer games available for users. The games may be controlled by voice or by the Google Home app. The user simply has to say "Ok Google, let's play a game", and a world of games is opened up.

The Google Home system is a very useful system that runs off of the Google search engine framework. It is compatible with many different appliances, similar to the Amazon Echo. Many smart home appliances are compatible with both Amazon Echo and Google Home, or may be compatible with just one.

For introducing smart technology into your home, it is up for debate about whether the Amazon Echo or Google Home are better suited. It is up to individual preference and needs as to which device would suit them better. Most smart home appliances are compatible with both, so it really depends on the user which one would be better to use. App design and function, as well as any existing smart devices may be the deciding factor, or it could be the price and interface system that decides which one to get. Either way, both are useful technologies for creating a smart home.

A downside to smart home technology is that most commands are verbal. Each device does have an app that will help control it, and is compatible with Android and Apple smartphones and tablets. There are commands that may be typed, but if an individual cannot type, then the app and technology may be more difficult to use. A way to get around verbalising commands is to use third-party applications such as Wink and SmartThings. The Wink app contains lots of pictures of each device you want to control, so it allows for easy access. The images below show how easy the app is to maneuver.



An additional way to control Amazon Echo/Google Home would be to use a speech-generating software such as the ones outlined in the next section. You could use these devices to either control the app directly, or to generate speech to tell the smart device what to do. There have been many examples of people using this technology, such as this youtube clip:

https://www.youtube.com/watch?v=6GERIh2EmXk

There are also other text-to-speech generators for tablets and smartphones, such as <u>Type and Speak</u>, which may be useful for individuals who can type.

#### **Communication Devices**

Communicating with non-verbal or minimally-verbal individuals may be challenging. Because of this, many technologies have been developed to help individuals communicate with their families, friends, and care workers. These technologies range from simple analog devices such as picture boards, to midway command buttons, all the way to advanced eye tracking technology. The technology that would be used depends on the individual, with their unique communication level, age, and the diverse range of abilities they may have. A senior that has not grown up with computers may not have much use for a computerized eye tracking device, but may benefit from buttons or pictures. However, a younger individual with an eye for technology may have great success with eye trackers.

#### Simple Devices

For individuals with limited communication, simple communication devices may be sufficient to allow the user to express their wants, needs, and feelings. An array of devices may be used as listed below:

- BIGmack buttons These are large buttons that play a pre-recorded message. When the button
  is pressed, the message plays. The messages may be requests, such as "I need to go to the
  bathroom", or could be greetings such as "Hi, how are you". These are available through many
  various retailers.
- Wristbands This is a simple concept that may provide many applications. For non-verbal individuals, answering a question may be a challenge. Using colour-coded wristbands, with one wrist signifying yes and one signifying no, may give more agency to the user to clearly demonstrate their wishes. This may even be applicable for choosing between two things if one wristband were to signify doing thing #1 and the other were to signify doing thing #2. The bands may be found through this website. If a crafty person were to be involved, caretakers could make wristbands out of coloured cotton and fabric paint or markers. This is a simple idea, and may be modified and improved upon.
- Communication boards These are explained more thoroughly in the last section on choice-making devices, but are also applicable here for general communication. They consist of pictures of different possible wishes and desires, such as the food items available for any given meal, different activities such as books or music, or different needs such as going to the bathroom or having a nap. These boards are available through many different retailers, organizations, and manufacturers.

### **Speech-Generating Devices**

There are many different kinds of technology available for people who cannot express their thoughts and desires out loud through speech. Eye trackers, which are explained in the next sub-section, are an emerging technology with great promise. For individuals who do not or cannot use eye trackers, there are other devices available. There are programs that allow text-to-speech generation, such as the <a href="Type">Type</a> and <a href="Speak">Speak</a> app for smartphones/tablets. Other organizations exist that focus on the specific issue of communication, and have created their own software and hardware targeted at this. An organization that creates equipment for individuals with aphasia has created touchscreen tablets and laptops that allow for easy communication, with <a href="many products">many products</a> available depending on the individual's needs. These

devices may be too complicated for users depending on their specific needs and abilities, which may warrant use of simpler devices as described above, or more high-tech as described below Other devices are available. The Pentke Romich Company (PRC) out of the US has created many speech devices that are compatible with many different controllers such as switches and head-tracking devices. Their Accent series of tablets is compatible with switches and head-tracking devices, and gives users an alternative to simpler communication devices. The specific pieces of equipment are listed below:

- Accent 1000 \$7295.00
  - This is a speech device that lets users select words, letters, and pictures to communicate their thoughts, feelings, and desires. It is a touchscreen and is compatible with switches and eye- and head-tracking devices for easy communication, and can mount to a wheelchair. The company produces the compatible eye and head-tracking devices, as well as switches. The Access 1000 does not have full access to the tablet's computer capabilities as per US Medicaid guidelines, but access may be purchased for a higher price.
  - o Available in English and Spanish
  - o Product link: <a href="https://store.prentrom.com/accent-1000">https://store.prentrom.com/accent-1000</a>
- Access 800 \$6595.00
  - This is a speech device similar to the above Accent 1000, but smaller and lighter. As with the Accent 1000, it is a touchscreen device and is compatible with switches and headtracking devices.
  - Product link: <a href="https://store.prentrom.com/accent-800">https://store.prentrom.com/accent-800</a>
- Access 1400 \$7595.00
  - This is a larger version of the Accent 1000, featuring larger icons for users who may need large buttons. It is also fully compatible with switches, eye-tracking devices, and head-tracking devices.
  - o Product link: <a href="https://store.prentrom.com/accent-1400">https://store.prentrom.com/accent-1400</a>
- Compatible products:
  - NuEye Tracking system for the Accent 1000, 1200, and 1400 \$6900
    - This eye-tracking system tracks the users eyes across the screen, following them as they go through different options for speech on the Access tablets. When the user focuses on a specific option for a longer amount of time, the option is selected and said out loud. This system is compatible for the Accent 1000, 1200, and 1400 (the Accent 1200 has been discontinued, but may still exist elsewhere).
    - Product Link: <a href="https://store.prentrom.com/nueye-tracking-system-br-accent-1400-accent-1200-and-accent-1000">https://store.prentrom.com/nueye-tracking-system-br-accent-1400-accent-1200-and-accent-1000</a>
  - NuPoint Head Tracking Accessory Kit for Accent 800, 1000, and 1400 \$1495.00
    - This devices uses a reflective spot on the users face, generally the head or glasses, to track where the user is looking on the Accent tablet screen. It tracks the head movements so that the user can select the letters, words, or pictures they want to communicate.
    - Product Link: <a href="https://store.prentrom.com/nupoint-head-tracking-accessory-kit">https://store.prentrom.com/nupoint-head-tracking-accessory-kit</a>

#### **Eye Trackers**

Eye tracking devices have great potential to open up a new world of communication for users. This technology was initially designed for video game systems to create faster, more intuitive game plays, but have proved to be just as applicable for individuals with limited verbal communication. Tracking

devices use near-infrared light (IR light) that is invisible to our eyes, but are picked up by the tracking device. The IR light is shone onto the eyes and reflects back onto the device, specifically locating the pupils. High-resolution cameras then take photos of the eyes, and the images are processed using algorithms to identify reflection patterns and eye details. This will find the eye position and the "gaze point", that is, the point on which the eyes will focus. The eye tracker will use this as a sort of computer mouse, following the gaze around the screen and selecting options when prompted. For example, a computer program specifically for communication will track the eyes across the screen as they go across multiple choices such as food options or activities, and will select the option that the gaze wants. There are many different options for this technology, each depending on the users wants and needs as well as the technology they already may have in their home. The most common and well-designed devices are produced by Tobii Dynavox, found at this link: <a href="https://www.tobiidynavox.com/en-US/products/devices/">https://www.tobiidynavox.com/en-US/products/devices/</a>. Their products are listed below.

- EyeMobile Plus \$3999.00 without purchase of a tablet.
  - This device attaches to a Windows 10 tablet, and uses the individual's gaze to access the tablet and all the applications on the tablet.
- EyeMobile Mini \$1548.00 without purchase of a tablet
  - This device is similar to the EyeMobile Plus, but with a smaller tablet attachment. It is designed specifically for the Microsoft Surface Pro.
- I-15+ and I-12+ price varies depending on software, location, and specific modifications to the device. There is currently no sales representative employed for Western Canada, but the representative for central Canada may be of use.
  - These are two tablets specifically designed by Tobii Dynavox to accommodate nonverbal individuals of varying abilities. It can be controlled both by gaze, touch, and switches, and works with a variety of applications such as Skype, phone, music, and communication.
  - The device mounts easily to a wheelchair, making it convenient for use by individuals with Cerebral Palsy or ALS or are otherwise wheelchair-bound.
- PCEye Plus \$13999.00 for Plus Track & Learn; \$1699.00 for Plus Access with Windows Control Software
  - This device attaches to desktop computers, and provides a range of options for users.
     The Plus Track & Learn is easy to use software and is designed for beginners, but limits the amount of functions that may be used on the desktop computer. The Plus Access is designed for users who can use the software, and gives full access to the desktop computer's capabilities.
- PCEye Mini \$849.00 for Track & Learn; \$1199.00 for Access with Windows Control
  - This device may be used for both desktop and laptops. The Track & Learn device, like with the PCEye Plus, does not give full access to the computer, but is easy to learn and use. The Access with Windows Control is designed for users who can use the software, and allows for full access to the computer.
- EyeR \$299.00
  - This device functions similarly to a Smart Home device. It can be plugged into a laptop/desktop/tablet, then track the users gaze to control compatible televisions, lights, beds, air conditioners, DVD players, stereos, and toys. This has great potential for use in a smart home, and may be used to control Google Home/Amazon Echo devices.

Eye trackers may be used to control a smart home system – either through the app (only on compatible devices), or through "speaking" a command for the system. Many users of these eye trackers can use

them to control their own smart home systems and smart devices, even just to listen to audiobooks or music.

Funding for eye tracking devices may be available through many sources. CAYA (Communication Assistance for Youth and Young Adults) may provide loaner devices as well as funding for these devices. For individuals with Cerebral Palsy, there is a funding application for communication devices/equipment at the following links: <a href="https://www.bccerebralpalsy.com/programs/equipment-assistive-devices-funding-program/">https://www.bccerebralpalsy.com/programs/equipment-assistive-devices-funding-program/</a>; <a href="https://www.bccerebralpalsy.com/grants.html">https://www.bccerebralpalsy.com/grants.html</a>; <a href="https://www.bccerebralpalsy.com/grants.html">https://www.bccerebralpalsy.com/grants.html</a>; <a href="https://www.bccorebralpalsy.com/grants.html">https://www.bccorebralpalsy.com/grants.html</a>; <a href="https://www.bccorebralpalsy.com/grants.html">https://www.bccorebralpalsy.com/grants.

Two organizations may also provide funding for individuals with other disabilities: <a href="https://www.bchousing.org/housing-assistance/rental-assistance-financial-aid-for-home-modifications/home-adaptations-for-independence">https://www.bchousing.org/housing-assistance/rental-assistance-financial-aid-for-home-modifications/home-adaptations-for-independence</a>; <a href="https://www.marchofdimes.ca/EN/programs/adp/Pages/Adp.aspx">https://www.marchofdimes.ca/EN/programs/adp/Pages/Adp.aspx</a>.

## **Decision-Making/Choice-Making Devices**

Another area that has been identified as important for clients is in the ability to communicate choices. There are many choices that an individual has to make throughout the day, such as what to have for lunch, if they want to go anywhere, what they want to get when grocery shopping, or even what they want to watch on TV. This is a complex action, thus there are many different technologies available for non-verbal individuals.

- VoiceChoice App for iPad \$9.99
  - This app gives the user two options, which the caretaker customizes. The caretaker will take/upload a photo of each option, and then the app will place two options beside each other. The user will then tap on whichever option they want.
  - Product link: <a href="https://itunes.apple.com/us/app/voicechoice-verbal-assistant/id1266540796">https://itunes.apple.com/us/app/voicechoice-verbal-assistant/id1266540796</a>
- Buttons Across the internet, caretakers of adults with developmental disabilities have developed and advertise buttons for various types of communication. Most of them rely on the simple mechanism of pressing a button, and then a recorded voice command/answer will play.
  - o BIGmack buttons most individuals who could use them already have them, however they are useful and thus deserving of a description. These buttons allow for a caretaker to record a message, which is then played back when the button is pressed. For example, a button may hold a message that says "I want to go to the bathroom". When the user presses the button, they are indicating that they want to go to the bathroom.
  - Many variations of these buttons exist. Some may include two buttons on the same audio player, giving more options for the user to play back.
  - Attainment Talkers These are similar to the BIGmack buttons, which allow users to press the button and then a command/greeting will play. The attainment talkers have either 6 or 24 options, depending on which product you buy. They have multiple small buttons side by side, with pictures over them so the user can know which button to press for a specific command/greeting. This may provide a solution to the problem of not having enough options on the BIGmack buttons.
    - Product link: https://www.attainmentcompany.com/attainment-talkers

- Communication boards Image boards help nonverbal users to point to the options they want. For example, and image board may have a variety of available food options for someone to choose from for lunch. Using the message board, the user can point to/select the food item(s) they want to eat. There are a variety of message boards available.
  - http://www.givinggreetings.com/adultbook.html

#### **Television Control**

An area that has been identified as a need by some clients is control of their television and DVD/VHS devices. These give independence from their caretakers, as using simple devices would allow them to choose when they want to watch TV, and give them the agency to act on those choices. For watching TV, Google may provide one avenue of control. Using Google's Chromecast technology, either with or without the Google Home, users can choose what movies and TV they want to watch. They can use a tablet, computer, or smartphone to do so, using either the Google Chrome internet browser or the Google Home/Google Assistant app. For non-verbal individuals with speaking devices such as eye trackers, the speaking device may be used to control the Google Home device which will control Chromecast, and thus control the TV. Additionally, Amazon's Echo device may control smart televisions, giving users more options for controlling their TV. This type of service may prove difficult to use, so individuals may find it easier to use other applications. For television, both Shaw and Telus provide apps to control content and volume. Shaw offers an app that, on tablets, has lots of pictures for users to look through and choose with. Telus offers applications that function as a smart remote, and contain a lot of pictures for choosing programs.

## **Data Logging for Tablet App Usage**

It can be difficult to determine if an app is working for a client, or if the client is even using a new app. There are parental control applications that can be used that allow care workers to find out what apps a client is using and how long they are using them for. The most effective app available for this function is KidLogger.net. This website offers apps for Andriod and Apple tablets and cell phones, as well as Apple and Windows computers. The app for Apple tablets and cell phones is very restricted in function, only allowing for "parents" to check-in on the location of the device. However, the Android app, as well as the computer apps, have many functions that may prove useful for care workers to determine how often a client is using their tablet and the apps on the tablet. The app is available at three price points: Basic, Standard, and Professional. The Basic package is free, and has great functionality on Android devices and computers. The Standard and Professional packages are available at varying prices for either 3, 6, or 12 months, and offer more functions on Android devices. However, for the uses applicable to clients, the Basic package is the most appropriate one to use.