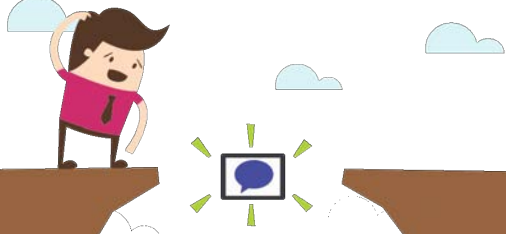


## Bridging Service Gaps in Aphasia through Technology



**Megan S. Sutton**  
MS, RSLP, CCC-SLP, SLP(C)  
megan@tactustherapy.com

## Disclosures

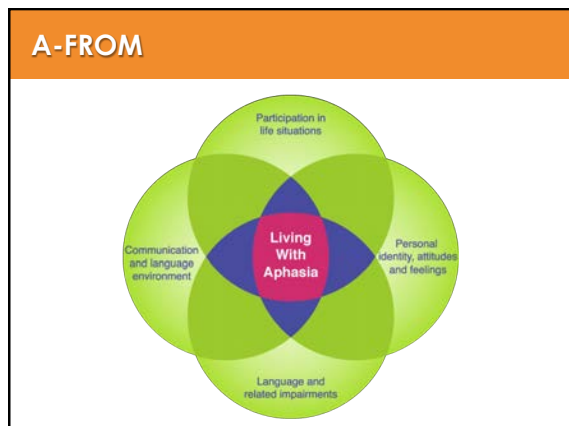
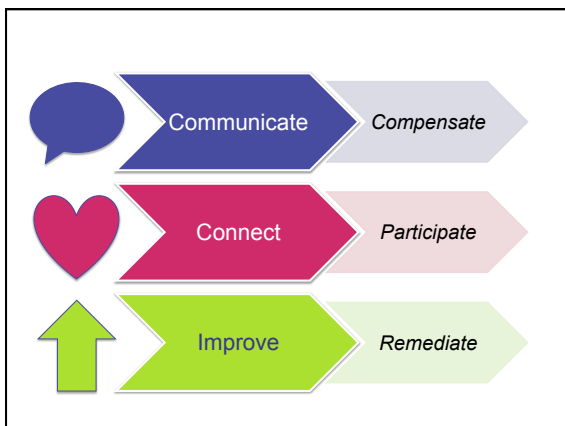
- Financial:
  - **Tactus Therapy**: receive salary and own stock in speech therapy app development company
  - **Healing the Broken Brain**: receive royalties from Hay House publisher as co-author of book
- Semi-financial:
  - **Various Apps**: free copies provided for evaluation & demonstration
- Non-financial:
  - **ANCDS & AphasiaAccess**: member
  - **Aphasia Recovery Connection**: volunteer
  - **UBC & Aphasia Camp**: clinical faculty

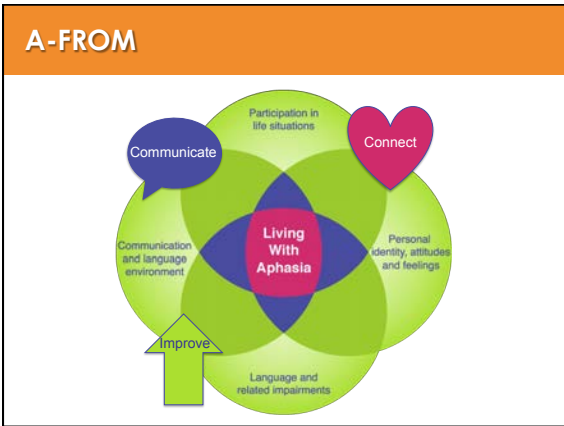
## Service Gaps

- Emergency → Acute → Rehab
- (gap?)
- Outpatient (1-3 x/week, daily gaps?)
- (gap?)
- Community Group?
  
- Prevailing SLP attitudes of working on impairments through to outpatient therapy, then no more improvements expected

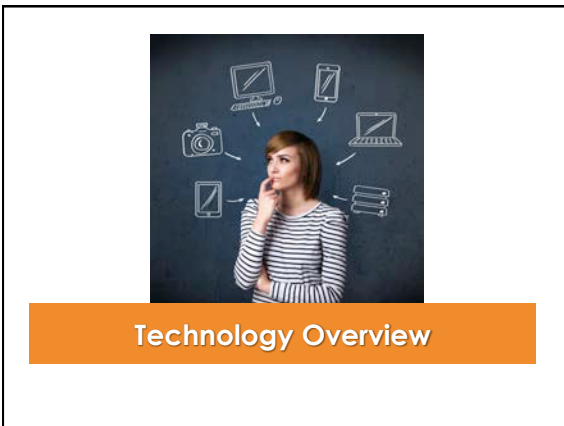
## Today's Premise

- By introducing technology *early and often* in the stroke recovery journey, people with aphasia can:
  - better **communicate** with their medical teams and families,
  - have stronger **connections** with loved ones, near and far, and
  - make faster **improvements** in language abilities.
- With the right technology, service gaps are no longer gaps in recovery





“For most people, technology makes things **easier**.  
For people with disabilities, technology makes things **possible**.”



**Mobile Touch-Screen Technology**

- Apple & Android  vs. 
- Smart Phones & Tablets



- Other Tech Hardware**
- Laptop & Desktop Computers
  - Old-school technology
    - Phones, Radios, TVs, DVD, CD, Fax
  - Smart Watches & Fitness Trackers (GPS)
  - Digital Cameras & Audio Recorders
  - Apple TV, Chromecast
  - Home Assistants (Alexa)
  - Accessibility & AAC Devices

- Software & Digital Products/Services**
- Software (computer programs)
  - Apps (mobile computer programs)
  - Podcasts (spoken word recordings)
  - E-books, Audiobooks
  - Video (YouTube)
  - Websites, Blogs
  - Online courses
  - Cloud storage
  - Social Media

## How Technology has Changed the SLP Toolkit

- ~~Pen & Paper~~ Stylus & Screen
- ~~Photo Cards~~ Google Images
- ~~Worksheets~~ PDF annotator app
- ~~Cassette Tapes~~ Voice recorder app
- ~~Tally sheets~~ Counter app
- ~~Stopwatch~~ Clock app
- ~~Sound level meter~~ Decibel meter app
- ~~Camereorder~~ Camera app
- ~~Photocopier~~ Camera + Email

## My App List & How-To Therapy Guides



[tactustherapy.com/applist](http://tactustherapy.com/applist)

[tactustherapy.com/howto](http://tactustherapy.com/howto)

- ACRT
- RET
- SFA
- PCA
- Word Finding
- VNeST

Show me the evidence!

## Evidence for Aphasia Treatment

- ASHA Evidence Map  
– [asha.org/Evidence-Maps/](http://asha.org/Evidence-Maps/)
- Australian Aphasia Rehab Pathway  
– [aphasiapathway.com.au](http://aphasiapathway.com.au)
- ANCDs  
– [ancds.org/evidence-based-clinical-research](http://ancds.org/evidence-based-clinical-research)
- Aphasia Treatment Evidence Tables  
– [aphasiatx.arizona.edu](http://aphasiatx.arizona.edu)

## Evidence for Technology & Aphasia

- A few recent studies:
  - Stark, B. C., & Warburton, E. A. (2016). Improved language in chronic aphasia after self-delivered iPad speech therapy. *Neuropsychological rehabilitation*, 28(5), 818-831.
  - Des Roches, C. A., & Kiran, S. (2017). Technology-based rehabilitation to improve communication after acquired brain injury. *Frontiers in neuroscience*, 11, 382.
  - Marshall, J., Cautle, A., Chadd, K., Cruice, M., Monnelly, K., Wilson, S., & Woolf, C. (2018). Technology-enhanced writing therapy for people with aphasia: results of a quasi-randomized waitlist controlled study. *International journal of language & communication disorders*.
  - Cautle, A., Cruice, M., Marshall, J., Monnelly, K., Wilson, S., & Woolf, C. (2018). Assistive technology approaches to reading therapy for people with acquired dyslexia. *Aphasiology*, 32(sup1), 40-42.
  - Kurland, J., Liu, A., & Stokes, P. (2018). Effects of a Tablet-Based Home Practice Program With Telepractice on Treatment Outcomes in Chronic Aphasia. *Journal of Speech, Language, and Hearing Research*, 61(5), 1140-1156.
- Many older studies: (older is relative in technology!)
  - MossTalk Words, C-Speak Aphasia, SentenceShaper, AphasiaScripts, MultiCue

## General Principles

"Technological advances are so rapid that evaluations of therapy technologies run the risk of being out of date soon after publication.

**Therefore, it is important to reflect on general principles.**

It is clear many PWA find technological treatments acceptable & can master a range of tools. Such tools can help to remediate or compensate for language impairments & provide a platform for social interaction."

-Dr. Jane Marshall, RCSLT Bulletin, June 2015

## Systematic Review

- This review provides evidence that computer therapy **is effective** when compared to no therapy and provides preliminary evidence that computer-delivered therapy **may be as effective** as clinician-delivered therapy for a specific population of individuals with aphasia.

Zheng, C., Lynch, L., & Taylor, N. (2016). Effect of computer therapy in aphasia: a systematic review. *Aphasiology*, 30(2-3): 211-244.

## Are SLPs Going to Become Obsolete?



## Absolutely not!

- What we do might change
  - Greater role in selecting, customizing, and monitoring a home exercise program
  - More time for conversation partner training
  - Larger focus on parts of the job that technology is not good at
  - More important to know what technology is good at (and how to use it)

## TECHNOLOGY TO HELP COMMUNICATE & CONNECT



## Technology = Communication

- How are you using technology to help your clients with aphasia communicate & connect?
  - AAC
  - Text messages
  - Email
  - Voice and video calls
  - Social media



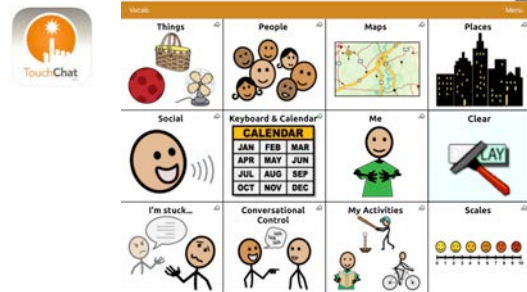
## Voice-Output AAC Types

- Visual Scene Display (VSD)
  - Pictures tell a stored story
- Picture-supported Stored Message
- Text-Based Stored Message
- Grid-Based Symbols or Pictures
- Keyboard
- Combinations of Above

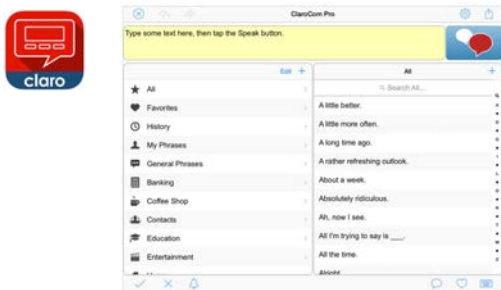
## Dedicated AAC Apps

- Multi-Format
  - TouchChat
  - Predictable, Chattable
- Text-Based
  - ClaroCom
- VSD
  - SceneSpeak

## Touch Chat Aphasia Journey Pageset



## ClaroCom



## Talking Photo Albums

- Pictello
- Little Story Creator
- Click 'n Talk
  
- MyPics – album organizer

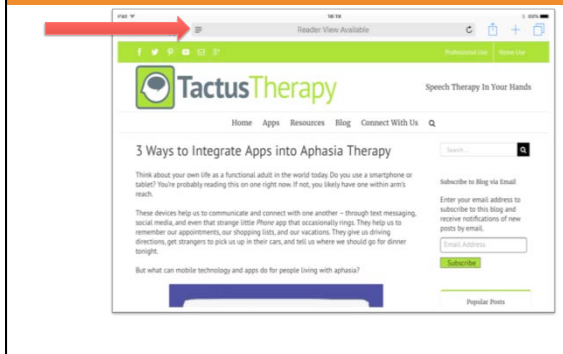
## Built-In Apps

- Great for supporting communication
  - Maps
  - Photos & Camera (stills & videos)
  - Reminders
  - Calendar
  - Contacts
  - Safari
  - Weather

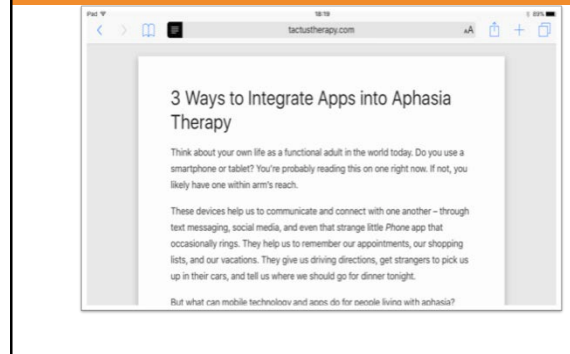
## Accessibility Features for Reading

- Speak Selection
  - Turn on in Settings – General – Accessibility
  - Select text, choose "Speak" from menu
- Reader View
  - Available on many websites
  - Removes distracting elements

## Website WITHOUT Reader View



## Website WITH Reader View



## Accessibility Features for Writing

- Dictation
  - Turn on in Keyboards, requires Wi-Fi or 3G
  - Types what you say when you touch the microphone icon on the keyboard in any app
  - Useful for biofeedback on speech intelligibility
- Word Prediction
  - Built-into the keyboard
- Abbreviation Expansion
  - Type a few letters for a full phrase to appear

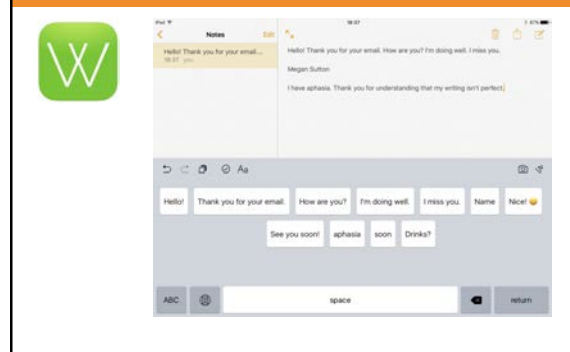
## Third-Party Keyboards

- Emojis – non-verbal communication
- Keeble – lots of accessibility features
- WordBoard – store messages

## Augmentative Tools

- Message banks
  - Copy and paste into email or text messages
  - Store in Notes or use WordBoard keyboard
- Whiteboard & Notepad apps
  - Bamboo Paper (iPad) - notebook
  - AlphaTopics AAC

## WordBoard



## AlphaTopics



## Apps for Social Interaction

- Facebook
  - Friends and family
  - Aphasia Recovery Connection for support
- Instagram
  - Minimal language requirements, share experiences while recording events
- Video Calls – Skype, Facetime
- Social Games – Words with Friends

## Holistic Recovery Resources

- Self-Monitoring
  - Health app for tracking steps, blood pressure, diet, sleep, etc.
  - Day One journal for daily reflections & writing
- Mindfulness/Stress Reduction
  - Buddhify or Headspace for meditations
  - Breathing Zone for deep breathing

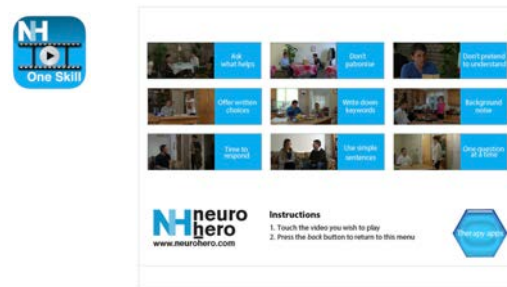
## Resources for Independence

- Transportation
  - Uber or Lyft
- YouTube
  - Videos can help spread the word for self-advocacy
  - Instructional videos to learn new skills visually
- Meal Prep Services
  - Order recipes/ingredients or pre-made meals to encourage healthier eating

## Aphasia Education

- One Skill Videos
- Aphasia Town

## One Skill Videos Communication Strategy Education



## Technology = Cognitive Assistant

- Calendar
- Clock (alarm & timer)
- GPS & Maps
- Google, Wiki, Hey Siri/Alexa/Google!
- Voice memos
- Reminders, Notes
- Automatic Bill-Pay

## TECHNOLOGY TO HELP IMPROVE



## Therapy Software

- How are you using technology to help your clients with aphasia get more therapy?

- Comprehensive Programs



- Tactus Therapy
- TalkPath Therapy (Lingraphica)
- Constant Therapy (The Learning Corp)
- MoreSpeech (Bungalow)
- Parrot Software



## Therapy Software

- Why is it important?
  - Evidence-based
    - Based on research & research shows it works
  - Neuroplasticity
    - Repetition
  - Customizable (some is also personalizable)
  - Not Enough 1:1 Therapy
  - Clients Want to Improve (Patient-centered)
  - Clients CAN Improve

## Improvement in Chronic Aphasia

- Stark & Warburton 2016 – Cambridge UK
- Self-delivered speech therapy provides an opportunity for individualized dosage as a complement to the speech-therapy regime in the long-term rehabilitation pathway. In a crossover design study, the Comprehensive Aphasia Test (CAT) and Cookie Theft Picture Description (CTPD) were used to measure untrained improvement in a group of chronic expressive aphasic patients after using a speech therapy app: **Language Therapy 4-in-1 by Tactus Therapy**.
- A pilot study (n=3) and crossover design (n=7) comparing the therapy app with a non-language mind-game were conducted. **Patients self-selected their training on the app, with a recommended use of 20 minutes per day.** There was significant post-therapy improvement on the CAT and CTPD but no significant improvement after the mind-game intervention, suggesting there were language-specific effects following use of the therapy app. **Improvements on the CTPD, a functional measurement of speech, suggest that a therapy app can produce practical, important changes in speech.** The improvements post-therapy were not due to type of language category trained or amount of training on the app, but an inverse relationship with severity at baseline and post-therapy improvement was shown.
- **This study suggests that self-delivered therapy via an app is beneficial for chronic expressive aphasia.**

## Purpose-Built Comprehension Apps

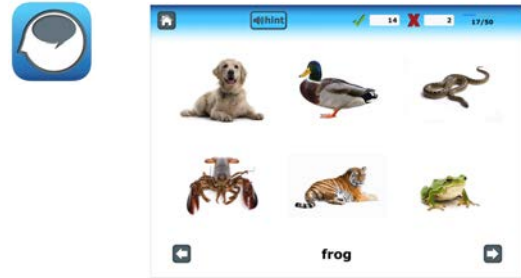
- Language Therapy 4-in-1 (Comprehension & Reading Therapy)
- Advanced Language Therapy 4-in-1 (Adv Comprehension & Adv Reading)
- Category Therapy
- Answering Therapy
- Lexico Cognition
- SentenceBuilder Teen



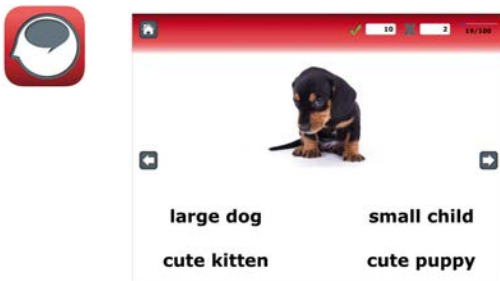
## What to Do with These Apps

- Watch how the client:
  - Attends to the stimulus
  - Searches for the answer
  - Reacts to feedback
  - Problem-solves when they need help
  - Self-monitors and self-corrects
- Adjust levels, presentation mode
- Teach strategies to client & caregiver
- Assign for home practice

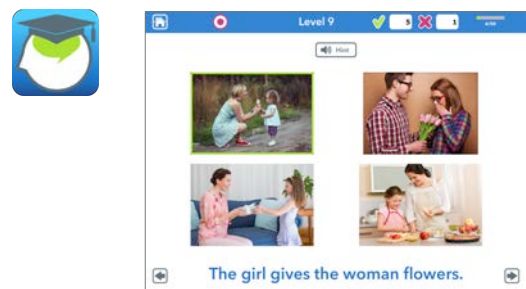
## Comprehension Therapy



## Reading Therapy



## Advanced Comprehension Therapy

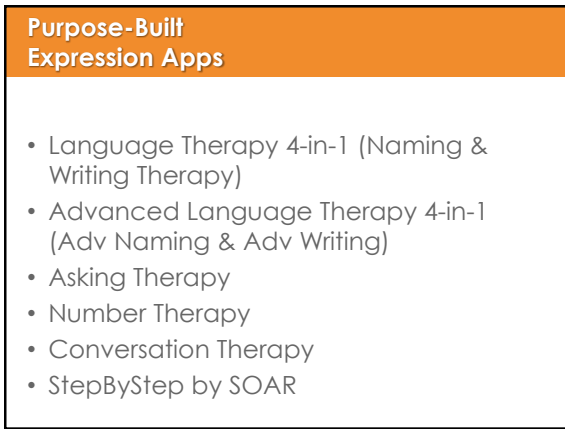


## Advanced Reading Therapy



## Category Therapy





### Advanced Naming Therapy

WHO HEAT WHAT

cook heat leftovers

blacksmith is heating iron

Mother heats a bottle

Create 3 sentences.

### Advanced Writing Therapy

What's the weather like?

Check

Report Report Story

q w e r t y u i o p

a s d f g h j k l return

z x c v b n m ! ?

### Asking Therapy

Tim

Jill and Teresa are going.

who where

when why

### Number Therapy

2:42

eight-five-five seven-one-seven-nine

588-7179

check

repeat

### StepByStep

SELECT A SEQUENCE

ADULTS

Baking a Cake (10 Steps)

Doing Laundry (10 Steps)

Grocery Shopping (10 Steps)

Making a Sandwich (10 Steps)

Serving a Drink (10 Steps)

Brushing Your Teeth (10 Steps)

Getting Dressed (10 Steps)

Making a Bed (10 Steps)

Making a Flower (10 Steps)

Washing a Car (10 Steps)

### Conversation Therapy

Guest

Why are some people rude?

### Purpose-Built Comprehensive Therapy Apps

- Constant Therapy (iOS or Android)
- Lingraphica TalkPath (web or iOS)
  - Web-portal to check progress or assign tasks
  - Includes cognitive tasks

### What to Do with These Apps

- Assign and monitor home programs
- Provide a way to continue after therapy
- Access a large number of stimuli

### Apraxia Therapy Apps

- Purpose-Built
  - Mouth Video
  - Syllable Lists
- Adapted
  - Photo Albums

Somewhat artificial divide between aphasia/apraxia apps. Use both for whomever will benefit.

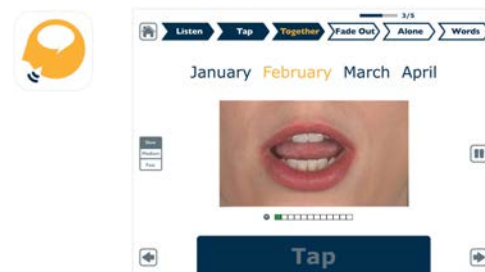
### Purpose-Built Apraxia Apps with Mouth Videos

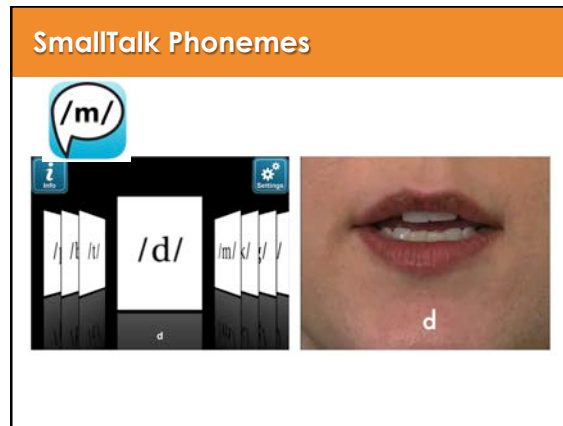
- Apraxia Therapy
- Speech Sounds on Cue
- Lingraphica SmallTalk Phonemes, Blends, Phrases

### What to Do with These Apps

- Clients can use independently & repetitively
- Build confidence
- Build vocal volume
- Self-cueing strategies

### Apraxia Therapy



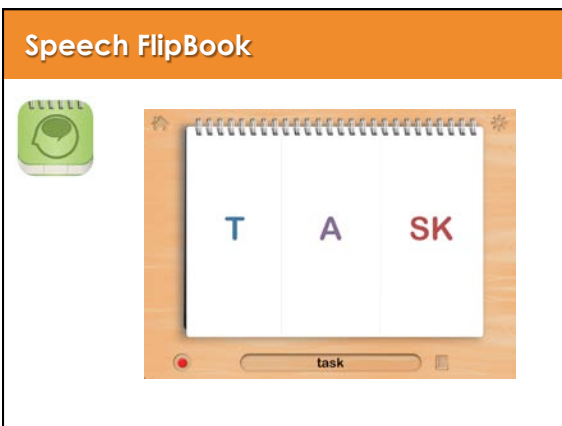


### Purpose-Built Apraxia Apps with Syllables

- Speech FlipBook
- NACD Speech Therapy for Apraxia Series

### What to Do with These Apps

- Generate word lists
- Practice in a sound hierarchy
- Record and play-back for self-monitoring
- Home programs



### Conversation Starters

- Conversation Starter Apps
- News on the Internet
- Google Images
- Social Media

### What to Do with These Apps

- Find personal interests & motivations
- Practice writing, drawing, & gestures
- Train caregivers on supported conversation
- Response Elaboration Training (RET)
- Reminisce, share stories, & share expertise
- Reveal competence, experience, & opinions

### “Virtual Reality”

- My PlayHome
- More Grillin’ & others by Maverick



### What to Do with These Apps

- Following directions
- Giving directions
- Target functional vocabulary
- Create a sentence describing what happened
- 2 iPads or a screenshot – barrier game

### Adapted Apraxia Apps

- Photo/Video Album Apps
  - Create your own mouth videos or talking stories
    - Little Story Creator
    - Pictello
    - Clips

### Pictello



### Little Story Creator

