

Smartphone and Tablet Apps for Case Managers and Their Patients

John Morris, Ph.D.

Ben Lippincott, B.A.

Tracey Wallace, MS, CCC-SLP, CBIST

Crawford Research Institute, Shepherd Center

Case Management Society of America - Palmetto Chapter

March 15, 2014



Shepherd Center

2020 Peachtree Road, NW Atlanta, GA 30309-1465 404-352-2020 shepherd.org



Objectives/Agenda

1. Distinguish between assistive and accessible apps
2. Identify accessibility features (input and output) of apps
3. Identify major categories of apps: e.g., patient and family education, location and wayfinding, memory
4. Identify specific apps in each of the categories above and their functionality
5. Evaluation

Who we are Shepherd Center

- Located in Atlanta, Georgia
- Founded in 1975
- Private, not-for-profit hospital
- Medical treatment, research and rehabilitation for people with spinal cord injury and brain injury
- Ranked by U.S. News & World Report among the top 10 rehabilitation hospitals in the nation
- 152-bed facility
- 965 admissions to its spine and brain inpatient programs
- 571 admissions to its day patient programs
- More than 6,600 outpatient visits annually



Who we are ... Wireless RERC

Rehabilitation Engineering Research Center for Wireless Technologies

- Funded by the U.S. Department of Education
- National Institute for Disability and Rehabilitation Research (NIDRR)
- Mission:
 - Promote equitable access to wireless technology
 - Promote Universal Design in future generations of wireless technology
- 5-year funding cycle
- In 3rd year of our 3rd cycle of funding
- Multiple research and development projects: including Apps Factory

Objectives/Agenda

1. Distinguish between assistive and accessible apps
2. Identify accessibility features (input and output) of apps
3. Identify major categories of apps: e.g., patient and family education, location and wayfinding, memory
4. Identify specific apps in each of the categories above and their functionality – LIVE DEMO
5. Evaluation

1. Distinguish between assistive / accessible apps

A fuzzy distinction

Assistive Technology creates access for people with disabilities by adding access features to a device through **specialized** additions (either software or hardware).

Accessible Technology includes any mainstream technology that is **already usable** by people with disabilities, and also encompasses assistive technology solutions.

Source: Center for Accessible Technology,
http://www.cforat.org/main_page/definitions.htm

1. Distinguish between assistive / accessible apps

An even fuzzier distinction ...

Assistive Technology allows you *to do things*:

- *Hear with hearing aids*
- *See with handheld magnifier*
- *Speak with speech generating device*

Accessible Technology allows you to *use things* the mainstream population uses because of design qualities

- Voice input to allow users with vision or upper extremity limitations to write text messages
- Voice output to allow the same users to navigate a list of contacts
- Simplified layout to allow easy understanding of how to use a device/ application

1. Distinguish between assistive / accessible apps

- A. Assistive technology** - Assistive technology devices and services were first defined in federal law in the Individuals with Disabilities Education Act of 1990 (Public Law 101-476).
- Updated in 2004 - Individuals with Disabilities Education Improvement Act (Public Law 108-446) to exempt school system's from having to provide surgically implanted technology such as cochlear implants.
 - **DEFINITION** – Any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities, *except a medical device that is surgically implanted.*

SOURCE: <http://www.gpat.org/Georgia-Project-for-Assistive-Technology/Documents/Definition%20of%20Assistive%20Technology%20Devices%20and%20Services.pdf>

1. Distinguish between assistive / accessible apps

B. Accessible technology *and Universal Design*

- **DEFINITION of Universal Design** – *Design that is more usable by as many people as possible at little or no extra cost.*
- *7 principles:*
 1. **Equitable use** – Useful and marketable to diverse people (curb cuts)
 2. **Flexibility of use** – Accommodates a wide range of individual preferences and abilities (scissors, ladles for right and left-handedness)
 3. **Simple and intuitive** – Easy to understand (instructions with images)
 4. **Perceptible information** – Meaningful feedback (sound, vibration)
 5. **Tolerance for error** – e.g., double-cut car keys, “undo” buttons
 6. **Low physical effort** – e.g., levers instead of knobs, touchscreens
 7. **Size and space for approach and use** – e.g., large icons for apps

http://www.ncsu.edu/ncsu/design/cud/about_ud/udprinciples.htm

Objectives/Agenda

1. Distinguish between assistive and accessible apps
2. Identify accessibility features (input and output) of apps
3. Identify major categories of apps: e.g., patient and family education, location and wayfinding, memory
4. Identify specific apps in each of the categories above and their functionality – LIVE DEMO
5. Evaluation

2. Identify accessibility features (input and output)

INPUTS

- Text input
- Dials or Drop down menus
- Voice or Speech-to-text (STT)
- Video or photo input
- Gestures


OUTPUTS

- Text output
- Voice output
- Voice playback
- Image or video output
- Vibration

SET-UP and MAINTENANCE

- Simple programming/setup
- Repeating programming
- Sync to computer
- Sync to cloud

ALERTS, ALARMS, REMINDERS

- Customized audio alarms
 - Vibrating alarm
 - Visual alarm
 - Nag/snooze, multiple alerts
 - Email or text message alerts
 - Alerts to multiple devices
- 

Objectives/Agenda

1. Distinguish between assistive and accessible apps
2. Identify accessibility features (input and output) of apps
3. Identify major categories of apps: e.g., patient and family education, location and wayfinding, memory
4. Identify specific apps in each of the categories above and their functionality – LIVE DEMO
5. Evaluation

3. Major Categories of Apps



A. Patient and Family Education



B. Patient Self Management

- Pill Identifiers, Management, Reference
- GPS / Location Apps
- Organization, Note-taking
- Emergency / Safety



C. Cognitive Training / Games




D. Caregiver and patient wellbeing



Objectives/Agenda

1. Distinguish between assistive and accessible apps
2. Identify accessibility features (input and output) of apps
3. Identify major categories of apps: e.g., patient and family education, location and wayfinding, memory
4. Identify specific apps in each of the categories above and their functionality – LIVE DEMO
5. Evaluation

LIVE DEMO

1. FINR Brain Atlas (\$1.99)
 2. Brain and Nervous System Pro (\$9.99)
 3. Skeletal Systems Pro II (NOVA Edition) (\$9.99)
 4. Pill Identifier Lite by Drugs.com (Free)
 5. Pill Boxie (Free)
 6. Evernote (Free)
 7. Corkulous (Free and \$4.99)
 8. Find my iPhone (Free)
 9. Red Panic Button (iPhone)
 10. In Case of Emergency (iPhone)
 11. Unblock Me (Free)
 12. Memory Block (Free)
 13. Happiness (Free)
 14. Caregiver Resilience (Free)
- 

Patient and Family Education

Brain, skeletal and nervous system

▪ Brain

- FINR Brain Atlas 585 Mb, \$1.99
- Brain Tutor 3D 1.4 Mb, Free
- 3D Brain 49.6 Mb, Free

▪ Nervous system

- Nervous System iPhone Edition 36.5 Mb, \$2.99
- MiniAtlas Central Nervous System 132 Mb, \$9.99

▪ Skeletal system

- Skeleton System Pro II (Nova Series) 372 Mb, \$9.99
- mLumbar Anatomy 64.2 Mb, \$3.99

Patient and Family Education - Brain

FINR Brain Atlas

- **Publisher:** Florida Inst. for Neurologic Rehab
- **Cost:** \$1.99
- **Platforms:** iPhone, iPod Touch, iPad
- **Version:** iOS 3.2 or later



Description

- “Explore the anatomy of the brain and common brain injuries in a 3D model. Injury illustrations include: aneurysm, anoxic/hypoxic encephalopathy, cerebral contusion, cerebral infarction/stroke, diffuse axonal injury, intraventricular hemorrhage,”
- Notes:
 - Lots of views of the brain (rotations, cutaways), with useful text
 - Very large file size, navigation can be complex

Patient and Family Education – Nervous System

Brain and Nervous System Pro

- **Publisher:** 3D4Medical.com
- **Cost:** \$9.99
- **Platforms:** iPhone, iPod Touch, iPad;
- **Version:** iOS 6.0 or later



Description

- “Explore the anatomy”
- Notes:
 - Lots of views of the brain (rotations, cutaways), with useful text
 - Intuitive navigation

Patient and Family Education – Nervous System

Miniatlas Central Nervous System

- **Publisher:** Licitelco
- **Cost:** \$9.99
- **Platforms:** iPhone, iPad, iPod Touch
- **Version:** iOS 3.1.2 or later



Description

- Detailed images of nervous system, with explanation in Eng/Spanish
- Zoom with fingers, and email any image or section of image
- Images of: Central, peripheral, and autonomic nervous systems; senses and principal routes of nerve conduction; diseases; and pain
- Notes:

Patient and Family Education – Nervous System

mLumbar Anatomy

Publisher: Anatomate-apps,

Cost: \$2.99

Platforms: iPhone, iPod Touch, iPad; iOS 4.2 or later (optimized for iPhone 5)



Description

- “Basic anatomy of the lower back (lumbar spine). Features animated visualizations, medical images and educational notes for anyone seeking an introduction to the lumbar anatomy.”
- Notes:
 - Nice interface
 - Simple, limited information

Patient and Family Education – Skeletal System

Skeletal Systems Pro II (NOVA Edition)

- **Publisher:** 3D4Medical.com
- **Cost:** \$9.99
- **Platforms:** iPhone, iPod Touch, iPad;
- **Version:** iOS 4.0 or later



Description

- “The Skeletal System Pro II - (NOVA Series) is a cutting edge app built on our NOVA technology. This is the most in depth 3D skeleton ever developed, the ability to rotate, cut and get superior/inferior views all with the simple stroke of the finger.”
- Notes:
 - Lots of views of the skeleton (rotations, cutaways), useful text
 - Extremely large file size, navigation intuitive, customizable

Patient Self Management



Pill Identifiers/Managers/Reference

- Pill Identifier Lite by Drugs.com 7.8 Mb, All, \$0.99
- iPharmacy Drug Guide, Sigmaphone 7.8 Mb, All, Free
- Pocket Pharmacist, Danike Inc. 1.8 Mb, All, \$0.99
- Pillboxie, Jared Sinclair 31.2 Mb, All, Free

Also:

- MobilePDR Prescribers Edition - available only to MDs, DOs, Residents, NPs and PAs



Patient Self Management – Pill Identifier, Manager, Reference

Pill Boxie

- **Publisher:** Jared Sinclair
- **Cost:** Free
- **Platforms:** iPhone, iPod Touch, iPad;
- **Version:** iOS 4.0 or later



Description

- “Pillboxie is the easy way to remember your meds. ... Pillboxie is easy because it lets you *visually* manage your meds. Scheduling a reminder is as easy as dropping a pill into a pillbox.”
- Notes:
 - Simple and intuitive
 - Not a drug reference, no database of existing drugs
 - Just shapes, colors, and ability to attach labels and notes

Patient Self Management – GPS/Location

GPS / Location

- | | |
|--------------------|--------------|
| ▪ FourSquare | 6.3 Mb, Free |
| ▪ Google Latitude | 8.9 Mb, Free |
| ▪ Find my iPhone | 5.3 Mb, Free |
| ▪ Parking Mobility | 3.9 Mb, Free |



Patient Self Management - GPS/Location

foursquare

Publisher: Naveen Selvadurai

Cost: Free

Platforms: iPhone, iPod Touch, iPad

Languages: Multiple



Description

- Keep up and meet up with friends on the go. Find the best places nearby. Record and share the places you visit.
- Notes:
 - Can be used by patient and caregiver to keep track of each other
 - Many downloads, high user ratings

Patient Self Management - GPS/Location

Parking Mobility

Publisher: Coal Harbour Group

Size: 3.9 Mb

Cost: Free

Platforms: iPhone, iPod Touch, iPad; iOS 6.1 or later



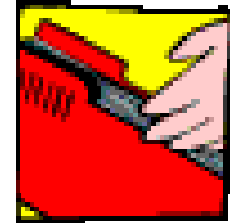
Description

- Parking Mobility is a community-based non-profit effort to bring citizens and their cities together to address disabled parking abuse.
- Take a picture of the violating vehicle parked in an accessible parking spot, and a picture of the license plate and send to Parking Mobility.
- Parking Mobility sends violating vehicle's pictures to the appropriate city who then ticket violator.

Notes: Lets user community build and update database of accessible parking anywhere in the world; crowd-sourcing

Patient Self Management - Organization

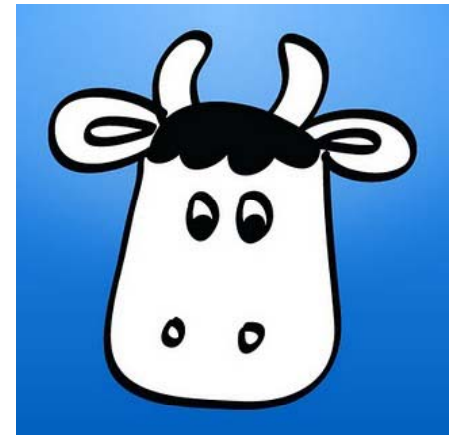
Organization / Notes



- Remember the Milk 10.3 Mb, Free
- Evernote 12.9 Mb, Free
- Corkulous 18.2 Mb, iPad, \$4.99

Patient Self Management - Organization / Notes

Remember the Milk



- Publisher: Remember the Milk Pty Ltd.
- Size: 10.6 Mb
- Cost: Free; Pro version requires subscription
- Platforms: iPhone, iPod Touch, iPad; iOS 5.0 or later

Description

- RTM connects with popular online service of the same name
- Syncs with Outlook, iCal, Google Calendar, Gmail, Twitter, etc.
- Organize by priorities, due dates, time estimates, repeating, lists, tags and more

Patient Self Management - Organization / Notes

Evernote

- Publisher: Evernote
- Size: 36.7 Mb
- Cost: Free; also \$45/year subscription
- Platforms: iPhone, iPod Touch, iPad; iOS 3.0 or later



Description

- Capture Anything - Save your ideas, things you like, things you hear, and things you see.
- Access Anywhere – Sync all your notes across computers and devices
- Find Things Fast - Search by keyword, tag or even printed and handwritten text inside images.



Patient Self Management - Organization / Notes

Corkulous

- Publisher: Appigo, Inc.
- Size: 21.0 Mb
- Cost: Free; also has Pro version costs \$4.99
- Platforms: iPad; iOS 6 or later



Description

- Corkulous follows the metaphor of a cork board where users can arrange notes, labels, tasks, contacts, and photos to visualize ideas.
- Related ideas can be easily placed together and aligned using automatic guides.
- As ideas grow, users can create new boards and group related ideas in separate virtual spaces. Free version allows only 1 corkboard.

Patient Self Management

Emergency / Safety



- Close Calls 0.3 Mb, Free
- SmartICE 3.5 Mb, \$1.99
- iSOS! - GPS emergency locator 0.3 Mb, \$0.99
- Silent Bodyguard 1.7 Mb, \$9.99
- American Red Cross Shelter View 0.2 Mb, Free

Patient Self Management - Emergency/Safety

ICE (In case of emergency)

Publisher: Minute Apps, LLC

Size: 19.8 Mb

Cost: Free

Platforms: iPhone, iPod Touch, iPad; iOS 7.0 or later



Description

- Use the information you already have about your emergency contacts in your device's Contacts app so you don't have to store separate records that need their own maintenance.
- Keep your emergency information organized - medical conditions, allergies, emergency contact
- Put your medical and emergency contact on your lock screen
- Store an ID card image just in case

Patient Self Management - Emergency/Safety

Red Panic Button

Publisher: Ultimate Communication Software, Ltd.

Size: 4.1 Mb

Cost: \$2.99

Platforms: iPhone, iPod Touch, iPad; iOS 5.0 or later



Description

- Simply set a panic number or mail address and the phone will send a message which contains your address and location, determined using the fine GPS based or coarse GSM based coordinates.
 - Send Panic SMS (works only on iPhone and iPad 3G)
 - Automatically send Panic email to designated email list
 - Facebook, Twitter integration
- Set the Emergency Number to be called by pressing Red Panic Button

Patient Self Management - Emergency/Safety

American Red Cross: Shelter View

Publisher: VisionLink, Inc

Size: 9.4 Mb

Cost: Free

Platforms: iPhone, iPod Touch, iPad; iOS 6.0 or later



Description

- Be Prepared – When disaster strikes know when and where shelters have been opened to provide assistance.
- Map View – The application maps locations and shelter details across the United States. Zoom in to the local area. View shelter details: capacity of the shelter and current population, the associated disaster event, shelter address, driving directions from your location.
- Shelters are only displayed if they are active and open.

Cognitive Training / Games



Memory building games

- Unblock me 21.9 Mb, Free
- Rush Hour 6.8 Mb, Free
- Braintrainer 3.9 Mb, Free
- MemoryBlock 24.4 Mb, Free

Cognitive Training/Games

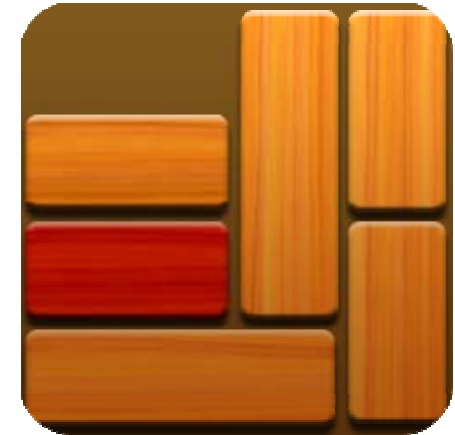
Unblock Me

Publisher: Kirakorn Chimkool

Size: 21.9 Mb

Cost: Free, can be upgraded

Platforms: iPhone, iPod Touch, iPad; iOS 5.0 or later



Description

- “A simple and addictive puzzle game. The goal is to get the red block out of the board by sliding other blocks out of the way.”
- 4 difficulty levels ranging from Beginner to Expert. 4200 puzzles.
- Two modes: Relax Mode and Challenge Mode
- Hint system to guide you through the puzzle.
- Notes: Many downloads, high user ratings

Cognitive Training/Games

MemoryBlock

Publisher: Category 5 Games

Size: 24.4 Mb

Cost: Free; \$0.99 for Pro version

Platforms: iPhone, iPod Touch, iPad; iOS 4.3 or later



Description

- Train your brain by keeping track of the sequence of 5 lights on the screen, then match it sequence for sequence by tapping the appropriate lights.
- Test and improve your reflexes with the new Speed Mode!
- Watch and listen as the computer shouts out colors for you to tap.

Objectives/Agenda

1. Distinguish between assistive and accessible apps
2. Identify accessibility features (input and output) of apps
3. Identify major categories of apps: e.g., patient and family education, location and wayfinding, memory
4. Identify specific apps in each of the categories above and their functionality – LIVE DEMO
5. Evaluation

Thank you!

John Morris

john_morris@shepherd.org, 404-367-1348

Ben Lippincott

ben@imtc.gatech.edu, 404-894-7034

Tracey Wallace

tracey_wallace@shepherd.org, 404-367-1484

This presentation was produced under the auspices of the Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC), which is funded by the National Institute on Disability and Rehabilitation Research (NIDRR), United States Department of Education, under grant number H133E110002. The opinions contained in this paper are those of the authors and do not necessarily reflect those of the U.S. Department of Education or NIDRR.