The Future of Home Stroke Recovery and Prevention

Where will Connected Health Tools Fit?

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Objectives

• Define mobile health terms and provide examples, cases and deployment applied to mobile technology for stroke recovery.

• Discuss the policies and trends influencing adoption of mobile health for stroke recovery.

• Describe how to serve the stroke population more creatively, effectively and profitably with the adoption of technology.

• Learn the importance of knowing the behavior change model to recognize and better engage patients to improve stroke recovery outcomes.
Background

Every stroke survivor has a story. My story involves a hole in my heart, a marathon, and overcoming many obstacles to eventually return to private practice as a physical therapist.

Along the way, I discovered that bridging the knowledge gap for stroke awareness and obtaining resources for home stroke rehabilitation are not an easy endeavor.

My journey included trying to set effective and creative rehab goals after my stroke at age 39, all the while balancing real life as a husband and father of three young children (ages 3-6 at the time of my stroke).

My goal is to share how my experiences have impacted my return to practice and how they motivated me to become a public health advocate for stroke awareness, better recovery options and prevention.
“Nothing Happens Unless Something Moves.”

—Albert Einstein
My presentation will look at the benefits of harnessing new health technology and mobile health data to improve therapy services, promote wellness and awareness through better patient engagement and help improve medical research. I'll also cover what I believe the future holds for the mHealth industry with respect to rehabilitation and prevention, and what challenges lie ahead for providers that consider adopting these new methods of care delivery.

Note: This is based on my personal experience, interviews and research. Please keep an open mind as this is new territory for all of us!
WARNING

Don't Be Like This Guy!

After telling the media that he doesn't have a Twitter account, Belichick said: "Just go talk to the geniuses online. MyFace, YourFace, InstantFace...just go talk to whoever you want that does that stuff. I don't know."
Stroke Recovery is Hard Work
You need the Right Team and Game Plan!
“Never Give Up”
Know who is on your patient’s team!
Attention Therapists:

Is this your current patient engagement game plan?

While these are good stickmen, they aren't great at patient engagement!
Show of hands if you are prescribing exercise videos?
(or is your HEP photocopied??)

May be time to evolve…
“If exercise could be bottled it would be the #1 prescribed medicine in the WORLD.”

—Unknown
Engagement Strategy#1 - Move to Mobile!

Smart Move:
Meet Your Patients Where They Want You to Be.
The Terms:

• **Mobile health** technology, or **mHealth**, refers to technology-based applications that allow a patient and a physician to clinically interact from different locations.

• **Connected Health**-Connected health is a model for healthcare delivery that uses technology to provide healthcare remotely. Connected health aims to maximize healthcare resources and provide increased, flexible opportunities for consumers to engage with clinicians and better self-manage their care.

• **Patient Engagement**-Patient engagement is a person’s sustained participation in managing their health in a way that creates the necessary self-efficacy to achieve physical, mental and social well-being. (-See 5 Key Elements)

• **Meaningful Use**-Meaningful use is using certified electronic health record (EHR) technology to: Improve quality, safety, efficiency, and reduce health disparities. Engage patients and family. Improve care coordination, and population and public health. Maintain privacy and security of patient health information.
The Trends

• Hospitals and other medical institutions are increasingly ‘going paperless’ with electronic health records (EHRs).

• Smartphone users are increasingly tracking their health through apps.

• Rehabilitation providers today face overwhelming challenges to providing optimal care, with rapid reductions from third-party payer systems.

• This pressure translates to the critical need to maximize efficiency with each treatment, decrease hospitalization, and ensure that continues when the patient goes home (to GET PAID).

• Connecting health involves a critical shift in treatment in which the patient becomes engaged in the intuitive sensory experience of what their body needs to do which allows for real learning and motor recovery.
Why start now?

Emerging accountable care organization's or ACO's will place great emphasis on continuity of care. Regardless of the role of a ACO's in our future, hospitals will feel increasing pressure to solve continuity of care problems to optimize patient satisfaction and clinical outcomes across treatment settings, especially when it comes to physical, occupational and speech therapy services. Continuous consistent rehab information will need to be shared as the patient moves from acute-care to inpatient rehab facilities to subacute care to home health on to outpatient therapy.

Consider how the current paper based system or a system where health records do not talk to one another do not serve the patient well.

I am a case for how the disconnect in the traditional care model for therapy for a stroke patient failed…
Examples of “Disconnect”:

Put Yourself in the Patient’s Position:

- Reordering Tests
- Repeating and Being “Re-Asked” to provide information time and time again
- Care not engaged, constantly scribbling / entering notes
- Waiting weeks or months to get started or see specialist
- No communication between providers on team
- Limited or no access to own health data, images, tests

The Problem in a Nutshell:

Providers are working across the continuum of care with little coordination and no collective eye or assumed responsibility on achieving maximal results.
The Technology

- EHR
- Sensors (demo- time permitting)
- Pharmacy prescription compliance, reminders
- Blood Glucose, Blood Pressure, Pulse Ox
- Monitoring EKG / Cardiac / Fetal Monitoring (see latest Apple Keynote)
- Mobile Smart Devices, Smart Watches, Scales, New Wearables (?iRing) enable input of biometric data, lifestyle choices-diet, caffeine consumption, sleep patterns
- Interactive Video Education and Coaching / TV (Apple and SmartTV’s)
- Remote Monitoring with technology allows for patient to become an active player in their treatment plan with a goal of staying well and decreasing hospital utilization.

Ask me about my stroke “checks”…
Barriers to Adoption:

- **Security of PHI** - Efficient and Secure Data Storage Will Accelerate Adoption.
- CMS Rules/Licensing b/t States/Politics
- Assumptions - Who will Use
- Reimbursement - Who and How it Gets Paid
- Initial Costs, Training and Time
The Samsung GALAXY S1 launched with three sensors and today’s GALAXY S5 has 12! Could fingerprint detection be key to improve mhealth security?

These highly sophisticated sensors make your smartphone a powerful potential patient engagement and medical research tool.

Adapted image source: http://www.healthcareitnews.com
Here are the smartphone sensors that medical researchers care most about:

- **Accelerometer** – Senses and measures the speed of the object it’s attached to. It also senses gravity, so it can also sense the angle at which it is being held.

- **Barometer** – Senses air pressure to determine your relative elevation. So as you move, you can keep track of the elevation you’ve gained (ie: stairs climbed or hills conquered).

- **Gyroscope** – Senses when you’re moving or stationary, measuring dexterity and gait stability.

- As well as their independent uses, all these sensors work with each other. For example, the GPS uses the accelerometer to calibrate for your running stride, so the ‘moving dot’ better captures your movement, which is detected by the gyroscope.

- These highly sophisticated sensors make your smartphone a powerful medical monitoring and research tool.
Why this matters

• You may not realize it, but sensors are already integrated into many of the most common smartphone tasks. The gyroscope is what rotates your display, the proximity sensor turns off the display when it is against your ear, and the ambient light sensor changes your display brightness depending on your surroundings.

• Each year more and more sensors are integrated into your phone, enabling the potential for more and more innovative development in health and medicine.
While health and fitness apps have been around ever since the app store launched in 2008, the valuable data inside them has been locked away for years in telecommunication clouds (or “silos”). It isn't till recently this has changed and consumer devices and digital health have begun to converge.

- In the last 12 months, the big 3 mobile players have launched their answers to the influx of personal health and fitness apps to improve communication.
  - **Google** – Google Fit
  - **Apple** – ResearchKit, HealthKit
  - **Samsung** – Sami
  - Intel
  - Microsoft
  - But what happened to Google Health? …closed in 2011 for lack of adoption
Apple announced **ResearchKit** as a companion to **HealthKit** earlier this year, and the program has gotten off to a fast start, enabling much larger medical trials than would have previously been possible. In one example, a Stanford University cardiovascular study gained more than 10,000 participants overnight.

“To get 10,000 people enrolled in a medical study normally, it would take a year and 50 medical centers around the country.”

—Alan Yeung, medical director of Stanford Cardiovascular Health

In the App Store:

Stanford's study, a joint effort with the University of Oxford, is one of five live in the App Store. Others include an asthma self-management program from Mount Sinai, Weill Cornell Medical College, and LifeMap; a Parkinson's study from the University of Rochester and Sage Bionetworks; a diabetes analysis tool from Massachusetts General Hospital; and a breast cancer study from the Dana-Farber Cancer Institute, UCLA Fielding School of Public Health, Penn Medicine, and Sage Bionetworks.

ask me about my own PFO/stroke example and struggles with enrollment…
I believe the effective deployment of mobile health technologies and connecting community health could hold the key to living better lives, making high-quality care accessible, promoting and providing incentives for wellness, and reducing our national debt (and our possible emerging national security crisis*).

*Just ask retired Lieutenant General Mark Phillip Hertling, former Commanding General US Military Europe and now on the President’s Task Force for Physical Activity and Fitness about this emerging crisis…
Fit to Fight?

Here are some disturbing statistics from Lieutenant General Hertling’s TED talk:

- Greater than **75%** of potential recruits ages 17-24 years could not enlist even if they wanted to join the military as they were not qualified. The main criteria making them ineligible was **obesity**.
- Of the remaining 25% that could qualify (that were not obese mainly) greater than **60%** could not pass a **basic PT test** given on the first day of basic training.

Here’s what the PT test included:
1. One minute of push ups
2. One minute of sit-ups
3. One mile run

“Be fearless in prescribing exercise”

Image source: https://en.wikipedia.org/wiki/Mark_Hertling

PT’s-Be sure to see his stat on femoral neck stress fractures.

We Simply Can’t Continue to Ignore This!

Projected obesity rates nationwide

By 2030, advocates predict that more than 50 percent of residents in 39 states could be obese. The U.S. government projects 42 percent obesity nationwide.

Strokes are Happening Earlier-We Need to Educate Earlier.

We need a better proactive plan. PTs this means you!
We ARE the Exercise Experts.

Source: CDC
Consider this....

Today's iPhone user touches the screen over 100 times a day!

- And when you consider that 79% of people aged 18-44 have their smartphones with them 22 hours a day, it’s a pretty reliable resource at that.

- Today’s youth will be tomorrow’s patients and they will look to mobile for care. Plan now to invest in the next generation.

- Learn from some of the best design teams like Apple! Intuitive-engaging-responsive. They have already studied and tested this stuff for you!!

Ask me about how AppleWatch saves teens life...

Source: Global Web Index 2014
In addition to Clinical Excellence…

You Now Need Technical Excellence.

Your patients will demand it!
Here’s part of the problem (as I see it):

**We Know this Stuff:**
IOS 9, 3D Touch, 4K Video, M9 Motion Coprocessor, Live Photos

**We Don’t Know this Stuff:**
Types of vitamins, what fuels our brains, stroke warning signs, how we process food, etc… in short: How our Bodies Work!

Ask me about First Lady Obama bumping me off call…
...and this comment from a young student:

“My teacher wouldn’t put that poster in the classroom”.
Why?
“It has a scary old lady on it!”
What I've Learned:
Contrary to common methods used by therapists, physical rehabilitation is not a cognitive task taught through verbal instructions; rather it is a sensory-based learning experience that needs to be experienced repeatedly.

High tech or high touch?
What’s best??

Ask me…Is this an impossible task or an “EPIC” opportunity?
Both!

“MacGyver” it!

My Bag of Tricks

Learn What Motivates Your Patient

“Dad, when you feel better, can you pick me up?”
Connecting health involves a critical shift in treatment in which the patient becomes engaged in the intuitive sensory experience of what their body needs to do which allows for real learning and motor recovery. This includes the survivor becoming invested in that outcome.

Sound too difficult?

Physician Styles Of Communicating With Patients

- Biomedical
  - Physician-Directed
    - 70% of physicians employ this style

- Psychosocial
  - Patient-centered
    - Gold Standard/Best Practices

Adapted from D. Roter et al.
Start By Using What Technology You Have Available:

This could mean something as simple as adding music to rehab...
Music
The auditory and motor centers of the brain are linked and want to work together.

Music “ignites” the brain, starts a rhythm that is highly repetitive and makes rehab fun!

*(ie)* Walk Like a Man

Refer to most current Apple Keynote-esp. AppleTV and Medical Spotlight
http://www.apple.com/apple-events/

What song brings you back?
(My personal favorite is Hells Bells)
ASK YOUR PATIENT!!
One of the most important things a therapist can do is provide hope during rehabilitation and offer a well thought out game plan.

**Caring is contagious!**
(Regardless if it is reimbursable!!)

This sets off a positive cascade including self-motivation, commitment and continued progress, even when formal therapy has concluded.
How to do It?

No One Best Method!
Can Stroke Education / Engagement Go Viral?

How to be as Engaging as THIS!

“If they aren’t sharing they aren’t caring!” - unknown

Work to Create Shared Experiences

68% of teens on mobile recorded a video today. When was your last video?
What’s being worked on for stroke recovery:

Patient Centered Outcome Research Institute (PCORI)
Mobile Apps For Stroke Recovery

Mobile Apps (MAPPS): Patient & Caregiver Attitudes, Behaviors, and Knowledge

Partnership for Physical Rehabilitation Post Stroke
http://www.pcori.org/research-results/2015/partnership-physical-rehabilitation-post-stroke

PT Trend?: New Physical Therapy Partnership Revolutionizes Post–Surgical Hip and Knee Rehab
http://www.huffingtonpost.com/marki-flannery/new-physical-therapy-part_1_b_7451448.html
Key Elements:

Here’s what Dr. Joseph Kvedar, Director of Partner’s Center for Connected Health identified as key components to achieve what he described in a 2010 keynote as “Emotional Automation: A Critical Component of Healthcare’s Future.”

He stated for successful adoption a health technology must start by having these qualities:

1-Frictionless
2-Social
3-Personalized

Partner’s Center for Connected Health Health

http://connectedhealth.partners.org
Here’s What I’ve Done:

Nutrition Education

Weight Management University (WMU) is now

Looking For More Great Nutrition Partners!

IF YOU SHARE THE SAME DESIRE TO Bring Nutrition Education to Your Community WE WANT YOU TOO!!
Watch the Video to learn about WHY our Nutrition Education Model Works!

Why WMU is Needed Now in Schools and Communities

Here’s the Facts: “Only 12 percent of adults and two percent of children currently eat a healthy diet. Only 3.8 percent of U.S. elementary schools, 7.9 percent of U.S. middle schools and 2.1 percent of U.S. high schools provide daily physical education for students, according to the Centers for Disease Control.”

- David Damereau, MSPT PTC Physical Therapy

Exercise Education

Video Based
Home Exercise Program
Prescribe and Monitor Therapy Compliance

Analysis | Patient Engagement | Education

Performance Measurement

"Live" wireless motion capture technology
Strap on sensor
Collect data
Review

Analysis | Patient Engagement | Education

Monitor and Support
- Webinars
- Quizzes
- Books
- Incentives
Accountability Touch Points to Better Engagement:

- Simple reminder to exercise, take meds (text, email, app)
- “Nudge” to log your pain score or monitor vitals
- Update of something new! … “Did you know?”
- Webinar announcement / educational opportunity
- Send the message…The team is thinking about your success and we want to be sure you stay on track…. 
- Simply staying connected to support after "discharge"

Should Docs prescribe “apps”? 
Why it Works

Through the power of accountability!
Our Brain is a survival organ!

It takes the brain 36 times to gain 80% Mastery

...and Repetition!

Must see the skateboarding physics professor’s video on how we learn

Engagement has Evolved From My Early Days of popcorn, surveys and flipping kangaroos!

I can personally guarantee it wasn’t “frictionless” but it was personal, social and still EFFECTIVE!

See my Pulse article on Linkedin
If Bill Can Do it…
So Can You!

Lead and Inspire Your Team to Start Now!
My Challenge To You:

Be at least as engaging as my dog!
Or You’ll Eventually Get Caught Chasing Your Tail…
Thank you!

More Resources:
know-stroke.org/keynote