Wearable Devices & Mobile Health for AYA Preventive Care

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Conflict of Interest Statement

• I have no commercial relationships to disclose
• I will not be discussing any unapproved uses of pharmaceuticals or devices
Outline

• **Mobile Health Apps for CPS**
  - Overview
  - Finding “good” apps
  - Specific examples

• **Wearable & Connected Devices for CPS**

• **Discussion Questions**
Mobile Health Apps
What Teens Like About Mobile Apps for Health

Among 13- to 18-year-olds who have downloaded mobile apps and are very/somewhat satisfied with them, percent who cite the following reasons:

- Helped track stuff I needed to pay attention to: 63%
- Motivated me: 46%
- Provided useful reminders: 34%
- I learned a lot: 27%
- Was fun: 25%

Wartella. Teens, Health, and Technology 2015
Key Challenges for Apps

• Privacy of data
  - 81% of reviewed DM apps had NO privacy policy (Blenner JAMA 2016)

• Endless living & dynamic app options
Lack of Curation in Multiple Domains

APA App Evaluation Model

- **Interoperability**
  - Making sure data is used meaningfully

- **Ease of Use**
  - Understanding usability and adherence

- **Evidence**
  - Ensuring the app may offer benefits

- **Risk / Privacy / Security**
  - Assessing for potential risk and harm

- **Ground**
  - Understanding the context of the app
Finding “Good” Health Apps

1. Review scientific literature
2. Search app clearinghouse websites
3. Search app stores
4. Review app descriptions, user ratings, reviews
5. Conduct a social media query within professional, and if available, pt networks
6. Pilot the apps
7. Elicit feedback from patients
App Clearinghouse Websites

Anatomy of an app card

- Condition Badge
- App Icon
- App Name & Tag

- mWellth Certified Badge
- Review Categories & Scores
- Device Support

- Digital Wallet
  Reward yourself

- Find apps by specialty
  Specialties...

- Best apps of the month
- Best iPhone apps
- Best Android apps
- Visit Our Forums
- Register / Login
Officially “Approved” Apps

- FDA approved 36 connected health apps & devices in 2016
- Natural Cycles App recently approved in Europe as a contraceptive
Finding AYA CPS Apps - Methods

- January – February 2017
- Team of 3 researchers, including 2 young adults, searched for the top applications
- Preventive Health Domains
  - Nutrition/diet
  - Exercise
  - Immunizations
  - Substance use
  - Sexual/reproductive health
  - Mental health
  - Safety
- Targets AYAs (e.g., Seventeen magazine)
Finding AYA CPS Apps - Methods

- **Top app criteria for workshop**
  - Free
  - Widely used
  - Highly rated
  - Recommended by top app lists
  - Appeals to broad populations
  - Adolescent/young adult focused
  - Interactive
  - Subjective “likability” on testing

- **Selected top apps across several domains**
Fitness – My Fitness Pal

• All-in-one calorie counter & exercise tracker
• Exhaustive food & nutrition database
• Easy data entry
• Has received many awards/recognition
Fitness – My Fitness Pal

Choose a device
- Fitbit: Your Fitbit can sync steps with MyFitnessPal
- iPhone 5S: Use your iPhone’s built-in M7 motion processor
- Add a device: Connect your step tracker to MyFitnessPal
- Don’t track steps: No step data will be stored

Need a Step Tracker?
Fitbit works great with MyFitnessPal. Track steps taken, distance traveled, calories burned, stairs climbed, active minutes and sleep.
Shop for Fitbit

Steps
Add to Diary
1,975 calories remaining
1,800 goal
-175 food
-175 exercise
6,996 steps
10,000 calories

Diary
TUE | Nov 19, 2013
1,800 goal
1,753 food
240 exercise
1,513 net
287 remaining

Dinner
- Briney Caesar Salad Dressing
  1 serving(s)
  122 calories
- Quinoa Caesar Salad
  1 serving(s)
  274 calories
- Wine
  Red Table Wine, 5 oz
  118 calories

Snacks
- Aged White Cheddar Puffs
  Pirate’s Booty, 2 oz (about 36 pieces)
  260 calories

Cardio Exercise
- Fitbit calorie adjustment
  6,996 Steps
  240 calories

News Feed
- iamchi: completed her food and exercise diary for 4/16/2014
- rmarjanpanic: has logged in for 10 days in a row!
Fitness – Zombies, Run!

- Ultra-immersive running game & audio adventure
- Each run is a mission in your own Zombie apocalypse, collect supplies as you go
- Provides audio drama + playlist
- Over 3 million runners
Fitness – Zombies, Run!

Walk, jog or run – it’s up to you. Mix your music & our thrilling story!

200+ action-packed missions. A new story every run!
Nutrition - Waterlogged

- Improve water intake
- Charts & reminders
- Photos of cups to quickly record water intake
- Appeared on multiple top app lists
- Can integrate with MyFitnessPal
Reproductive Health - Clue

- Period, PMS, fertility tracking app
Clue
Mental Health - Headspace

- Guided meditation and mindfulness app
- Highly recommended, lots of buzz
Mental Health - **Stigma**

- Personal journal, diary & mood tracker
- Find a supportive peer
- “Effortless” brief journaling
- Self-reflection word-clouds
Mental Health - Stigma

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Health Education - WebMD

- Symptom Checker
- Medication Reminders
- Conditions
- Medicine
- Refill & Transfer Prescriptions by Walgreens
- First Aid Information
- Local Health Listings
- Medical Terms

Duke MARGOLIS CENTER for Health Policy
Duke Clinical Research Institute
Practical Tips for Incorporating Apps into Practice

• **Demo**: Have recommended apps downloaded on your own device to show patient during visit

• **Captive audience**: Ask patients to download applications onto their smartphone while waiting for vaccines, AVS

• **AVS**: Include curated app recommendations in templated patient instructions
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Wearable & Connected Devices

- Increasing number of medical devices are getting connected to the internet
- Technology companies are shifting focus towards population health (Apple, Google)

Patel et al. JAMA. 2015
Wearable & Connected Devices
Investment in Digital Health is Soaring

Adrenaline rush
United States, digital health startup funding, $bn

Source: Accenture

*Forecast

Economist.com
Wearable & Connected Devices

- **Use of wearable devices**
  - 1-2% of US population
  - Estimated that sales will increase to $50 billion over the next few years
- Can track **many behaviors**
- **Versatility** and **portability** appeals to pts

Patel et al. JAMA. 2015
Wearable & Connected Devices

**TOP AREAS**

- Movement
- HR
- Sleep
Key Challenges for Wearable Devices

- Improving Access: Individuals with most to gain less likely to use them

Target to Offer Fitbits to 335,000 Employees

Aetna Will Subsidize Apple Watch in First U.S. Insurer Deal

Patel et al. JAMA. 2015
Key Challenges for Wearable Devices

• **Improving Access**: Individuals with most to gain less likely to use them

• **Sustaining Use**: Wear it, regularly use/sync. Half stop using within a few months

Patel et al. JAMA. 2015
Key Challenges for Wearable Devices

- **Improving Access**: Individuals with most to gain less likely to use them
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- **Accuracy**: Many devices, little evaluation

Patel et al. JAMA. 2015
Key Challenges for Wearable Devices

• **Improving Access**: Individuals with most to gain less likely to use them
• **Sustaining Use**: Wear it, regularly use/sync. Half stop using within a few months
• **Accuracy**: Many devices, little evaluation
• **Efficacy**: Mixed evidence

Patel et al. JAMA. 2015
I can't believe I work out so hard just to impress my Fitbit.

Wearing my Fitbit is like wearing yoga pants, they make me feel sporty even if we both know I slept in bed all day!
Efficacy of Wearable Devices

• Weight Loss with Fitness Trackers
  - ✔ More weight loss when combined with effective engagement strategies (Patel 2015 JAMA)
  - ✔ Increased steps with fitness trackers (Shuger 2011 Int J Beh Nut)
  - = No difference in weight (Harris 2015 Plos Med)
  - ✗ Fitness tracker group with less weight loss than control group (Jakicic 2016 JAMA)
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Discussion Questions

• How do you recommend apps (if at all)? Which apps are your favorites?

• Experiences with patients using wearable/connected devices +/- integrating that data into your care?
Thank You

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