

# Tech Assessment in the Mobile Age:

*Thoughts From the Trenches and Benches*

Garret Spargo

Director of the National Telehealth Technology  
Assessment Resource Center (TTAC)



# Mobile Evolution



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# Today's Talk

A top-down view of a desk with an orange surface. In the upper left, a black pencil with a blue band lies diagonally across a stack of white papers. Next to it is a small white eraser. Below the pencil is a silver pencil sharpener. In the upper right, a white ceramic cup with a brown leaf pattern is filled with dark coffee. A dark blue semi-transparent banner is at the top, and a larger dark blue semi-transparent banner is at the bottom, both containing white text.

A Definition of mHealth  
mHealth Programs  
mHealth Technology  
Thoughts from the test lab  
The role of assessment (and how to do it)

# Defining mHealth

“

To summarize the formal definitions by the World Health Organization, National Institutes of Health and the mHealth Alliance ...

”



# Defining mHealth

“

mHealth is using mobile devices  
for health-related purposes  
[not especially useful definitions]

”

# My Definition

“

Delivery of healthcare services in any of three distinct use cases:

- Provider-Centric Data Capture
- Patient-Provider Communication
- Patient-Oriented Data Capture

”



# My Definition, part two

“

Using mobile devices to support other health-related activities:

- Data access
- Videoconferencing
- General computing

”

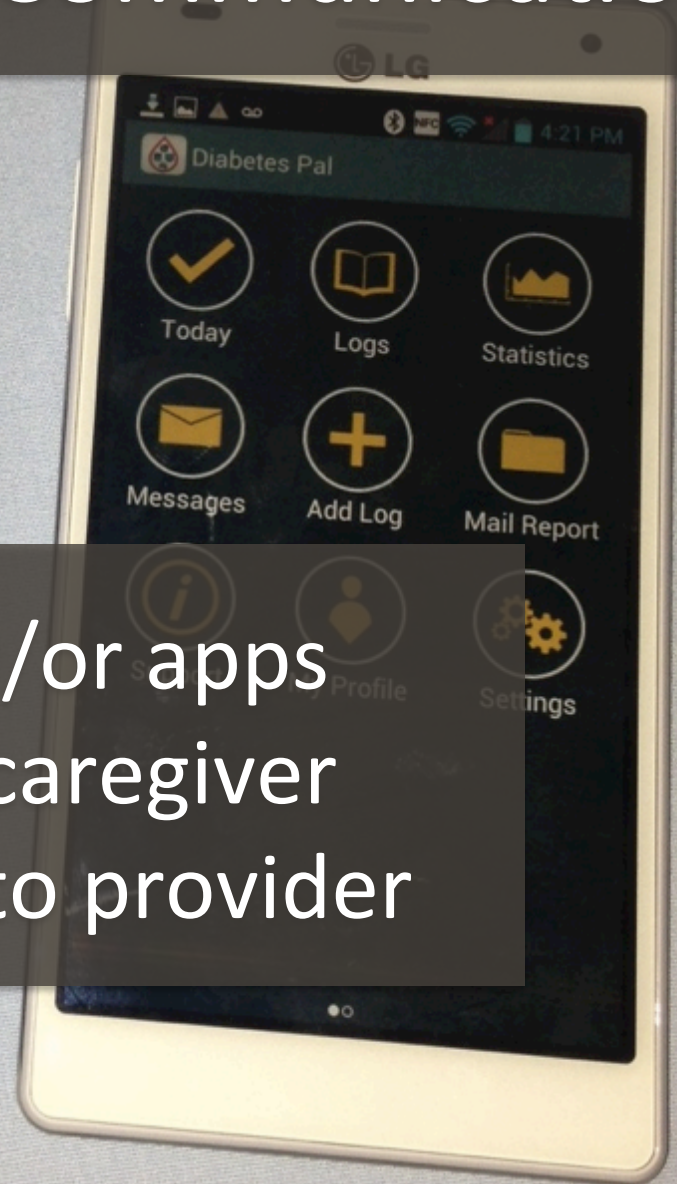
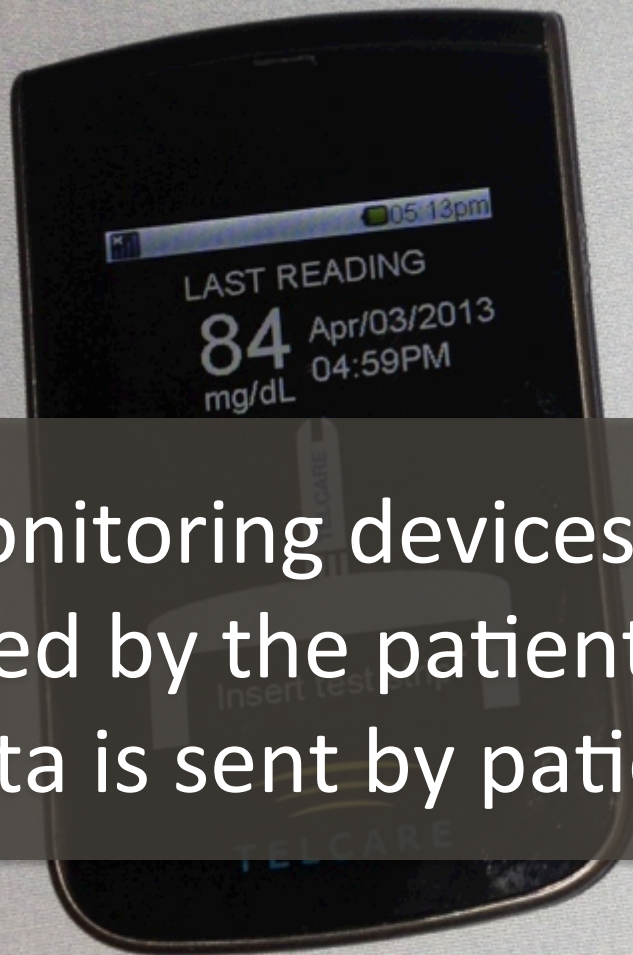
# Provider-Centric Data Capture



Imaging and/or monitoring devices  
Requires clinician to operate  
Data typically stays with physician



# Patient-Provider Communication



Monitoring devices and/or apps  
Used by the patient or caregiver  
Data is sent by patient to provider


# Patient-Oriented Data Capture



Monitoring devices and/or apps  
Used by the patient or caregiver  
Data is retained by patient



# The Programs – SMS “Texting”



1 new message  
received

Educational, encouraging, challenging  
Targeting behavioral change  
Minimal technological requirements

# The Programs – Data Collection



Activity trackers & calorie counters  
Medical device interfaces  
Electronic logs



# The Programs – Support Apps



Extension of data collection  
Shares results, informs of non-compliance  
Provides information about conditions

# The Technology – Hardware



Basic / Feature Phones  
Smart Phones  
Peripherals



A man in a white shirt and tie is holding a tablet. Numerous colorful app icons are floating around him, suggesting a focus on mobile applications and software technology.

# The Technology – Software

App Stores  
Application Programming Interfaces

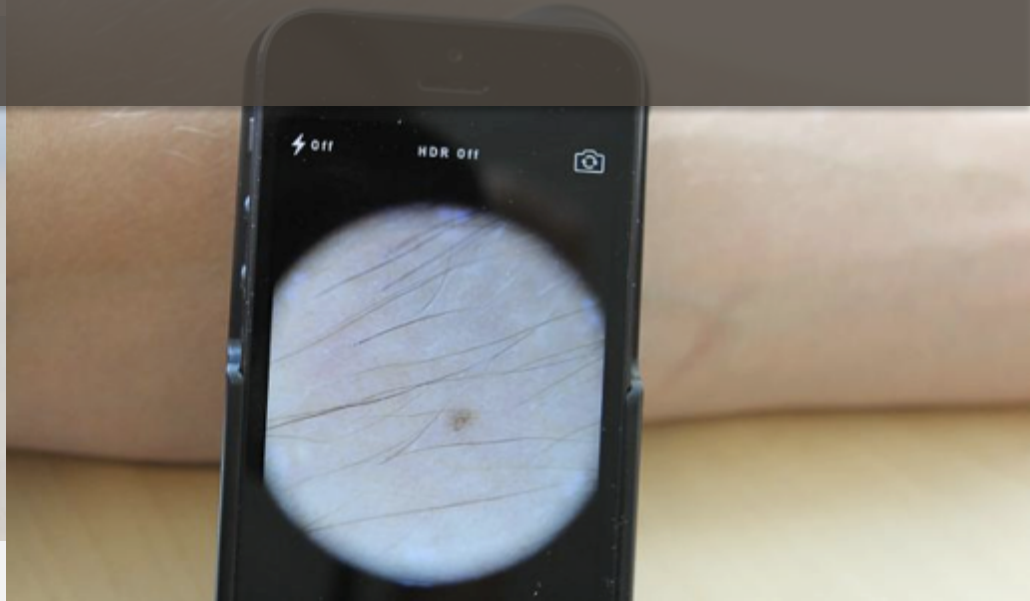
# The Technology – Servers

A photograph of a server room with rows of server racks. The racks are filled with electronic equipment, and many indicator lights are glowing. The room has a white tiled floor and a white door at the end of the aisle. A blue semi-transparent overlay covers the top and bottom portions of the image, containing white text.

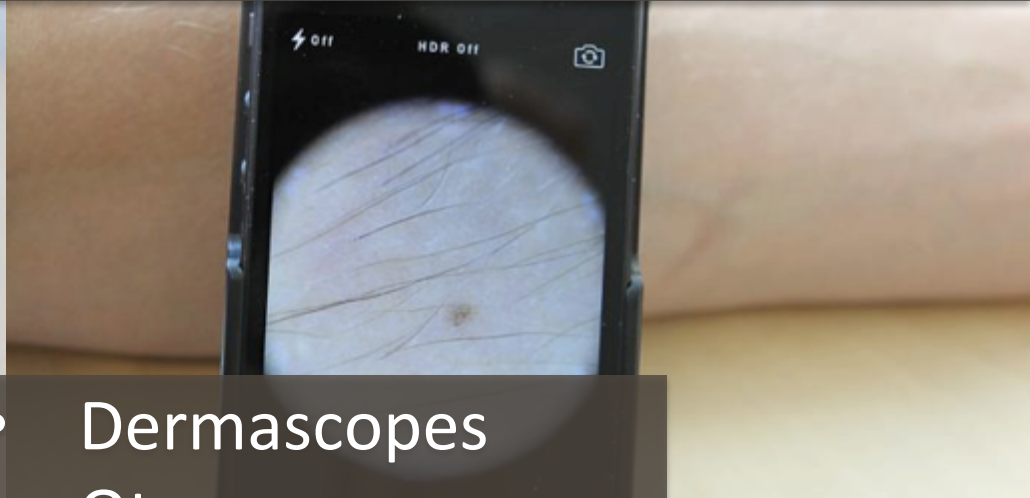
Patient data storage / access  
Provider access



# TTAC Testing



# TTAC Testing



- BP Monitors
- Body fat analyzers
- Scales
- Glucometers
- Activity trackers

- Dermoscopes
- Otoscopes
- Ophthalmoscope
- Wearables
- Stands and cases





# TTAC Testing

Withings

Send a message

Read a message

Main Menu

Settings

Main Menu

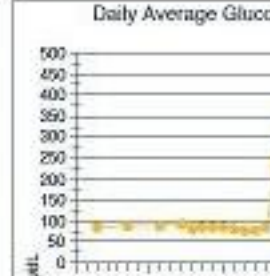
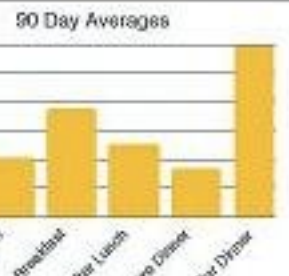
Application quality can vary widely  
Some great devices have terrible software  
Some great software has terrible devices

Diabetes Type 1  
17 Readings

LOWEST BG  
77

HIGHEST BG  
307

STAY  
73



Blood pressure

110 SYS

57 DIA

Aug 13, 2014

This week: Lose 1 lb

0 lb lost

1 lb left

Weight tracking

181 lb

Jul 30, 2014

Activity

34

0 %

Feb 26, 2014

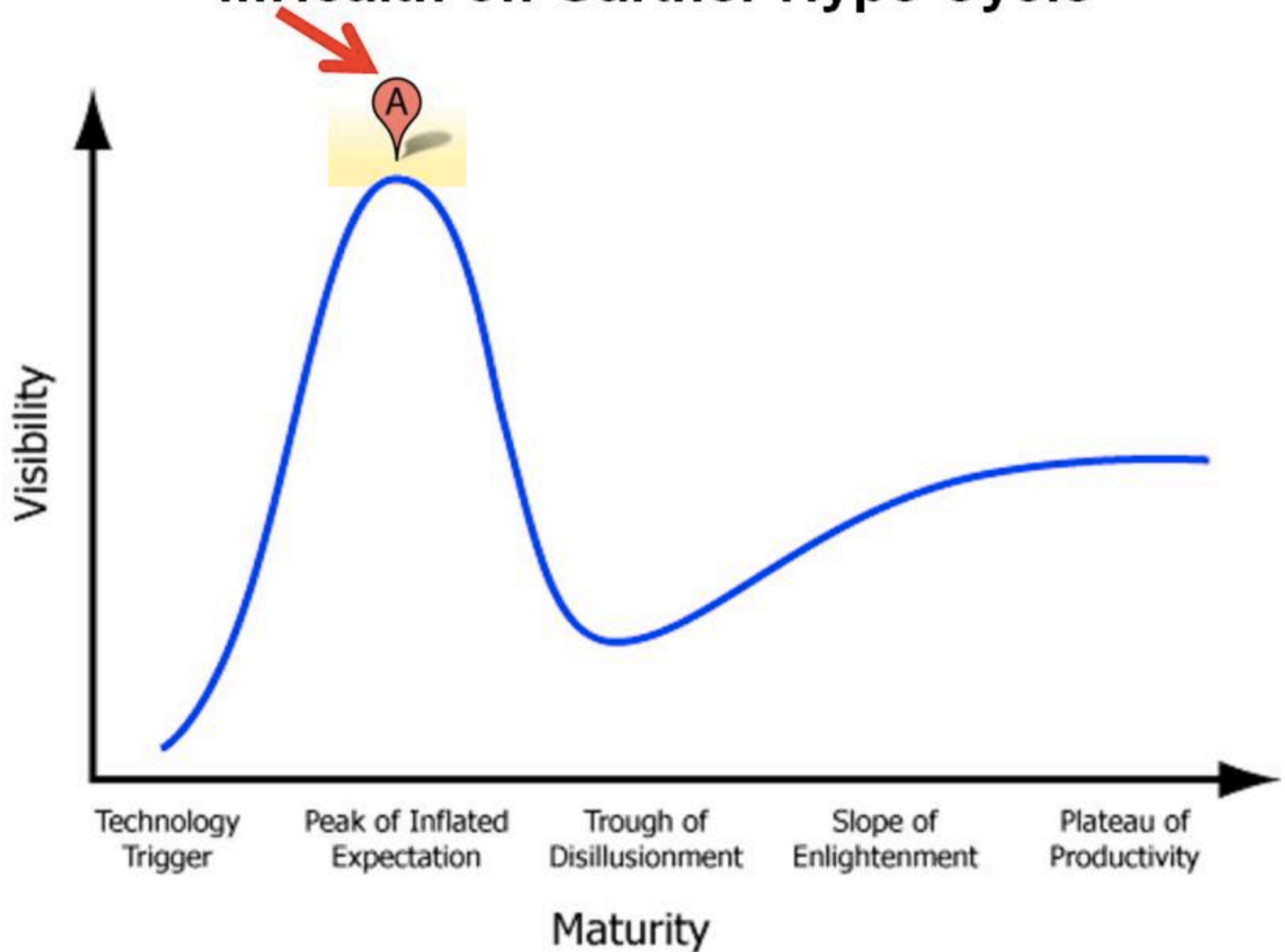
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
AVERAGE	116	84	82	133	106	17	17
MIN	79	77	81	84	84	85	85
MAX	180	91	84	227	307	259	196
STANDARD DEVIATION	50	7	2	67	112	87	53

# TTAC Testing

A photograph of a baby with light skin and green eyes, looking upwards and slightly to the right. The baby's hands are near their ears. The image is partially obscured by two semi-transparent orange rectangular overlays containing text.

Young market, lots of hype  
IMS Institute for Healthcare Informatics  
Gartner's Hype Cycle

# mHealth on Gartner Hype Cycle





# Regulations - FDA

A close-up photograph of a medical stethoscope and a wooden gavel resting on a blue folder. The stethoscope is silver and blue, with its chest piece and tubing visible. The gavel is made of dark wood with a brass band. The background is a blue folder, and the overall image has a professional, clinical feel.

Mobile Medical Applications Guidance (Sep. 2013)  
Medical Device Data Systems (June 2014)



# Changing Financial Models

The background of the slide is a close-up photograph of a blue denim fabric. Overlaid on this is a red credit card, tilted diagonally. The card has the words 'CREDIT CARD' and the number '0000 0000' embossed on it. A US dollar bill is also visible, partially covered by the card, showing the portrait of Benjamin Franklin. The text 'FRANKLIN' is visible on the bill.

Accountable Care Organizations  
CMS Penalties for Readmission  
Employee Wellness Programs



# Technology Assessment for Mobile





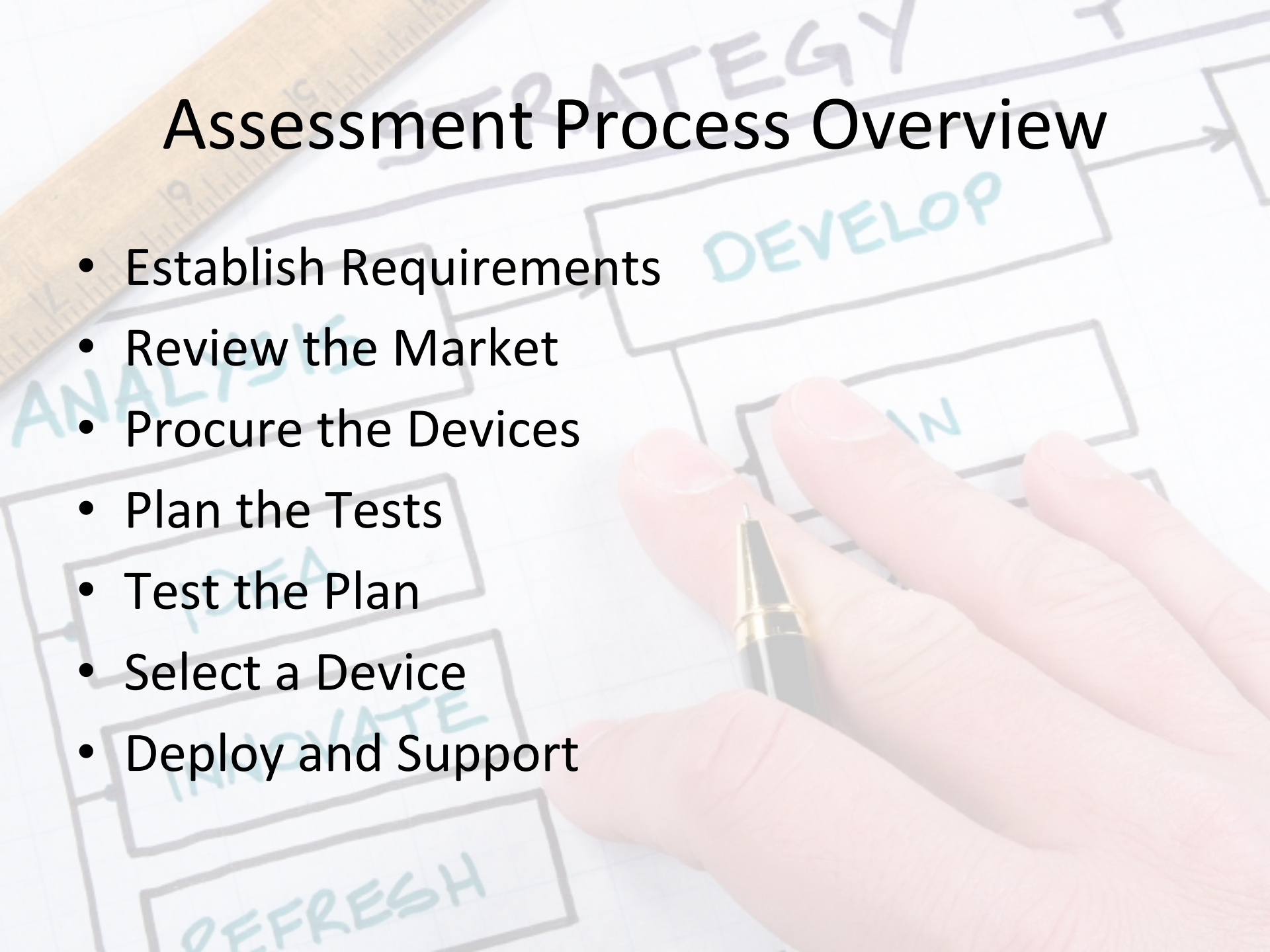
# Technology Assessment for Mobile

A close-up photograph of a baby's face, looking directly at the camera. The baby is holding a black mobile phone to its right ear with its right hand. The background is dark and out of focus, showing several other mobile phones scattered on a surface.

A few processes  
A few challenges  
A few resources

# Assessment Process Overview

- Establish Requirements
- Review the Market
- Procure the Devices
- Plan the Tests
- Test the Plan
- Select a Device
- Deploy and Support





# Establish Requirements

- Gather input from all stakeholders
- Create shared meaning around the requirements
- Think through a wide range of requirement types:
  - Functionality
  - Portability
  - Interoperability of Interfaces
  - Interoperability of Data
  - Usability

*If this is all you do, you will be ahead of those who just head to the market immediately.*



# Review the Market

- Use online resources – Google, Bing, Amazon, etc.
- Phone a friend – TRCs, OAT Grantees, TTAC
- Talk to organizations that have existing programs
- Contact manufacturers and vendors

*If you find yourself doing this before you have a firm grasp on requirements, go back a step.*

# Procure the Devices

- Manufacturers and vendors can be very useful
  - Loaners are a great thing!
- Buy and borrow what you need
- Keep it all organized
- Try to get devices in at the same time

*Your budget and time may not allow this – consider finding a way to get access to the devices at a store, conference, or from another telehealth program.*

# Plan the Test

- Quantity your requirements
- Develop methods to test against the requirements
- Planning and testing can be iterative

*This does not need to be an all-inclusive, massive test suite – determine what you are really looking for with these tests.*



# Test the Plan

- Test independently or in a group setting
  - Independent tests can prevent “group think”
  - Collaboration can foster new discussions
- Document EVERYTHING
- Be consistent
- Update the test as needed

*Have the right people involved at the right time – you can save a lot of frustration and repeated (or unnecessary) effort if the equipment is evaluated by the correct people.*

# Select a Device

- Get the reviewers together
- Discuss the scores – clarify discrepancies
- Consider bringing in the initial requirements team
- Be prepared for a second review of top devices
- Make a decision and share your results

*This will happen regardless of how many of the previous steps you have taken – your exact process here will vary depending on your other efforts.*

# Deploy and Support

A faint, light gray silhouette of a person is visible in the background. The person is walking from left to right, carrying a large box under their left arm and pushing a cart or trolley with both hands. The cart has a handle and a flatbed.

- Device Staging
- Configurations
- Spares
- Warranties
- Customer Support
- Troubleshooting
- Training
- Replacing Equipment

*This requires its own plan, process, and work that will likely be somewhat unique to each technology, organization, and deployment size.*



# The Challenges

A smiling female doctor with brown hair, wearing a white lab coat over a light blue shirt, and a green stethoscope around her neck. She is holding a black smartphone in her right hand. The background is white.

Lack of clear use cases for mobile services  
Need to develop a mobile plan at the org level  
Changing technological and regulatory landscape

# The Resources - TTAC

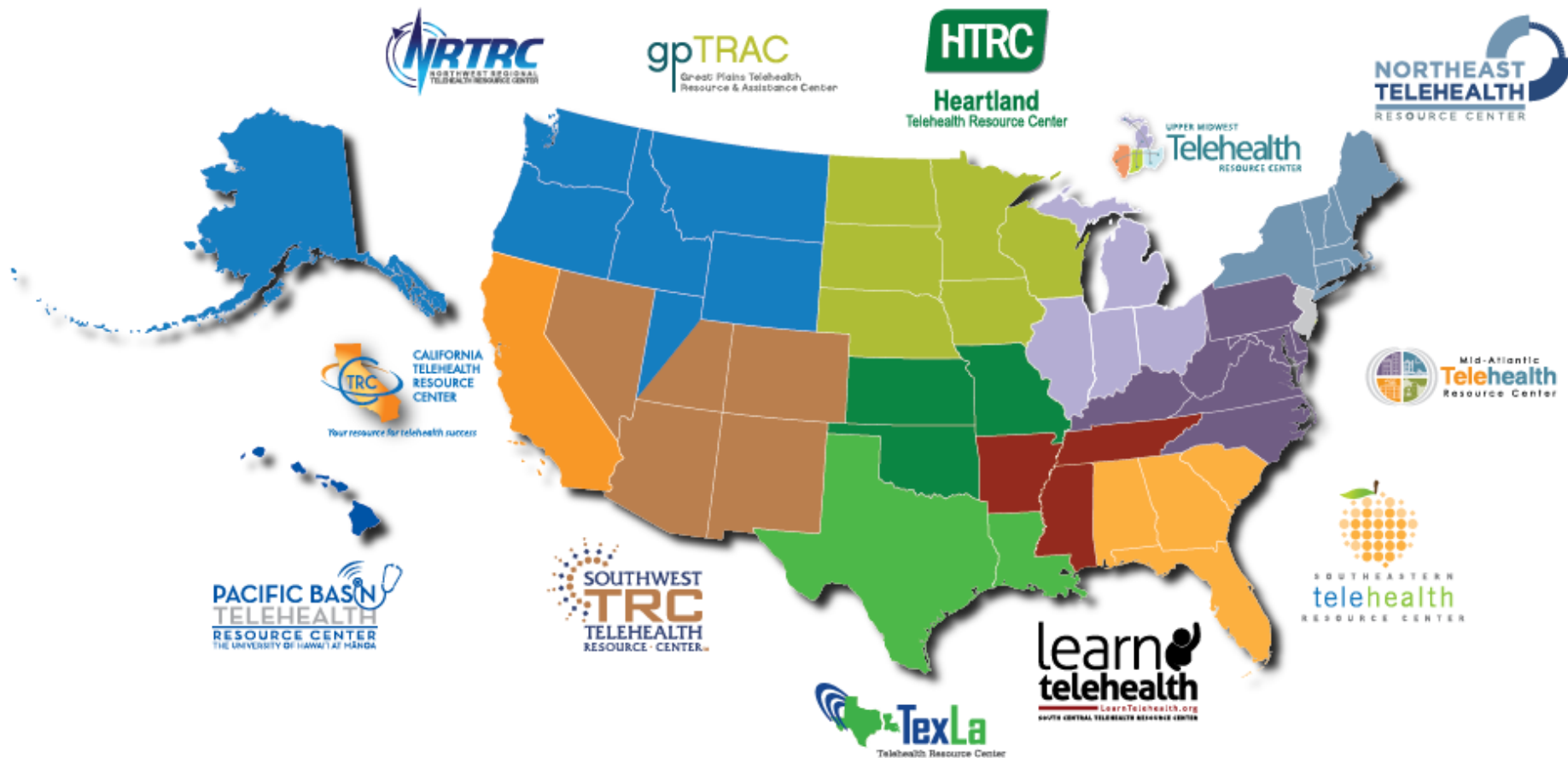
[gspargo@anthc.org](mailto:gspargo@anthc.org)

(907) 729-4704

[www.telehealthtechnology.org](http://www.telehealthtechnology.org)



# TelehealthResourceCenters.org



2 National Resource Centers

NRTRC	gpTRAC	NETRC
CTRC	HTRC	UMTRC
SWTRC	SCTRC	MATRC
PBTRC	TexLa	SETRC

12 Regional Resource Centers



# The Resources - Other

[imedicalapps.com](http://imedicalapps.com)

[mobihealthnews.com](http://mobihealthnews.com)

Happtique

ATA mHealth SIG

NIST Special Publication 800-163

IMS Institute for Healthcare Informatics

# Any Questions?

[gspargo@anthc.org](mailto:gspargo@anthc.org)

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