STATE OF MOBILE HEALTH

21st CENTURY HEALTHCARE PATIENTCARE
“EMPOWERED PATIENT”

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✓ HL7 International Ambassador & Speaker
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The views and opinions expressed in this talk are those of the speaker and do not necessarily reflect the official policy or position of any entity, agency or corporation.

NOW, let’s take a closer look……
The Quantified Self
Taking Control of Personal Health Data

Healthy Longevity
Caring for an Aging Population

Plus
- Tackling Obesity
- Digital Sensing
- Rise of the Nanorobots
- Special Section: The Virtual Human Project

Plus
- Digital Tracking of Cognitive Decline
- 21st Century Hearing Technologies
- Smart Imaging for Muscular Health
Mobile Health – Integrated Innovation

Engagement  Security  Privacy  Trust  Fitness  EHRs  Healthcare  Medications  Wearables

Safety
Patient Needs

Efficiency
Care Providers

Innovation
Guidelines
Best Practices
REFLECTION TIME!

- There are between 400,000 to 500,000 health & fitness apps (Jan 2019)
- There are over 325,000 mobile health apps (Apr 2018)
- There are over 165,000 mobile health apps (2017)
- There are over 150,000 mobile health apps (2015-16)
MOBILE HEALTH APP CHANGING TREND

Do You Have An App For That?
What people track using a mobile app now, versus what people would consider tracking with an app in the future

<table>
<thead>
<tr>
<th>Activity</th>
<th>Currently Track</th>
<th>Would Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise or heart rate monitoring</td>
<td>57%</td>
<td>85%</td>
</tr>
<tr>
<td>Weight</td>
<td>48%</td>
<td>58%</td>
</tr>
<tr>
<td>Diet</td>
<td>44%</td>
<td>58%</td>
</tr>
<tr>
<td>Sleep</td>
<td>42%</td>
<td>56%</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>16%</td>
<td>55%</td>
</tr>
<tr>
<td>Medication management</td>
<td>15%</td>
<td>52%</td>
</tr>
<tr>
<td>Mood</td>
<td>12%</td>
<td>36%</td>
</tr>
<tr>
<td>Blood sugar or diabetes</td>
<td>7%</td>
<td>35%</td>
</tr>
<tr>
<td>Pregnancy*</td>
<td>7%</td>
<td>26%</td>
</tr>
<tr>
<td>Period*</td>
<td>29%</td>
<td>23%</td>
</tr>
</tbody>
</table>

*Among a sample of 393 female respondents

Source: unknown
FUEL: MOBILE REVOLUTION!


Number of smartphones sold to end users worldwide from 2007 to 2017 (in million units)

This statistic shows the number of smartphones sold to end users worldwide from 2007 to 2017. In 2017, around 1.54 billion smartphones were sold worldwide. In the fourth quarter of 2016, 81.7 percent of all smartphones sold to end users were phones with the Android operating system.

Smartphone end user sales - additional information

In 2016, the number of smartphones sold to consumers stood at around 1.5 billion units, a significant increase from the 680 million units sold in 2012. This means that over 78 percent of the world's phones were smartphones.
FUEL: **IoT REVOLUTION!**

*Technology & Telecommunications › Consumer Electronics › Internet of Things - number of connected devices worldwide 2015-2025*

Internet of Things (IoT) connected devices installed base worldwide from 2015 to 2025 (in billions)

This statistic shows the number of connected devices (Internet of Things: IoT) worldwide from 2015 to 2025. For 2020, the installed base of Internet of Things devices is forecast to grow to almost 31 billion worldwide. The overall Internet of Things market is projected to be worth more than one billion U.S. dollars annually from 2017 onwards.
What is driving this phenomenal growth?

**KEY DRIVERS**

- Increasing global population
- Aging population (not only a Developed world issue)
- Higher Life Expectancy (people living longer)
- Increasing Chronic diseases*: e.g., diabetes, obesity, heart disease etc.
- Technological advances
- Emergence of Personalized medicine
- Global reach of diseases

*[Chronic Disease is a long-lasting condition that can be controlled but not cured]*
HEALTHCARE MARKET SIZE

- US GDP (2017)
  - $19.4T (=$19,386 Billion)*

- US Healthcare spending: 18% of GDP = $3.5T
  - (> ∑ of healthcare spending of rest of the world!)

- US Projected GDP by 2022
  - $23T

- US (projected) healthcare spending in 2022
  - 20% of the GDP = $4.6T

* [https://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm](https://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm)
MOBILE HEALTH MARKET

mHealth (mobile health) industry market size projection from 2012 to 2020 (in billion U.S. dollars)*

The statistic shows a forecast regarding the value of the global mHealth market from 2012 to 2020. For 2017 the mHealth market is forecast to be valued at around 25.39 billion U.S. dollars. The number of mHealth apps downloaded worldwide was expected to reach a high in 2016, with an estimated 3.2 billion downloads, almost double the number of downloads in 2013.
HL7 MOBILE HEALTH WG MISSION

- HL7 Mobile Health Work Group creates and promotes health information technology standards and frameworks for mobile health.


- **MH Friday calls** – @11am EST (all are welcome, no cost to participate on the call)
HL7 MOBILE HEALTH WG CHARTER

- Identify (and develop, as applicable) data standards and functional requirements that are specific to the mobile health environment.
- Identify and promote mobile health concepts for interoperability as adopted and adapted for use in the mobile environment.
- Coordinate and cooperate with other groups interested in using mobile health to promote health, wellness, public health, clinical, social media, and other settings.
- Provide a forum where HL7 members and other stakeholders collaborate to standardize the secure exchange, storage, analysis, and transmission of data and information for mobile applications and/or mobile devices.
Mobile Health Scenarios

- Caregiver on the move
  - Hospitals, Clinics, Long term care, Hospice

- Patient empowerment
  - Patient involvement in care process across a wide range of lifestyles, including: support for long term conditions

- Independent living
  - Assisted living drawing on a range of mobile services

- Behavioral health
  - Behavioral health support anytime, anywhere

- Messaging (ranging from unsecure to secure)
  - Bridging the health divide

- Public/Population Health
  - Disaster Management to PH outreach
MOBILE HEALTH MARKET TRENDS

1. Main driver: Ever increasing global smartphone users
2. Young Customers will drive the market
3. MH apps leveraging features of smartphones or tablets
   - Location service
   - IM
   - Picture, Video
   - Gyroscope
   - Accelerometer
   - Micro payment service
4. MH apps native rather than web-based applications
5. Rise of MH app stores
6. 2nd generation mHealth applications will focus on chronic diseases
7. MH will push/expand/broaden the health business model
8. MH apps entering traditional (health) distribution channels
9. MH apps will bridge the global health divide
10. Evolving MH standards
APP CENTRIC VIEW OF THE WORLD

TODAY DIGITAL HEALTH CONSISTS OF A COMPLEX CONNECTIVITY ECO-SYSTEM WITH THE APP IN ITS CENTER

Ways to connect digital health data and their respective main use cases

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21st CENTURY HEALTHCARE PATIENTCARE

“EMPOWERED PATIENT”
**Health care or healthcare** is the maintenance or improvement of health via the prevention, diagnosis, and treatment of disease, illness, injury, and other physical and mental impairments in human beings.

Healthcare is delivered by health professionals (providers or practitioners) in allied health professions, physicians, physician associates, dentistry, midwifery, nursing, medicine, optometry, audiology, pharmacy, psychology, and other health professions. It includes the work done in providing primary care, secondary care, and tertiary care, as well as in public health.

21st CENTURY CARE

- 20th Century model: care giver provides care to care receiver

DISRUPTIVE MODEL

- 21st Century model: care receiver obtains care from care giver
  (think of Smart Phones, Twitter, Uber, Airbnb…)
“THROUGH THE LOOKING GLASS”
HEALTHCARE IN THE 21st CENTURY (baker’s dozen)

1. Next generation: “iPAD™” kids

2. Blurred Lines:
   - Impact of Social Media
   - Concept of Privacy

3. Are we there yet: I want it NOW

4. Take Charge: Consumer Health, PGHD, PRO

5. Gene to genes: from Star-Trek (Gene Roddenberry) to Genetic Health – personalized medicine, Predictive Analytics

6. Space – The Final Frontier: “Healthy” flights
.....21st CENTURY (cont.)

7. Back to the Future: Longitudinal Health Record

8. Live long & prosper: from provenance to preservation


11. “l'addition s'il vous plaît”: Mobile micro-payments

12. Take care: CyberHealth, Blockchain

13. Alexa dating Watson?: AI, Machine Learning, Bots
EMERGING OPPORTUNITIES....

- Patient Engagement (patient portal, MHR: mobile health record)
- Mobile Health App data
- Medical device data
- IoT device data
- Patient Report Outcome (PRO) data
- Patient Generated Health data (PGHD)
- SDOH: Social determinants of health data
FUTURE POSSIBILITIES!

- Prescribing Mobile Health Apps
- UHAI: Unique Health App Identifier! (UDI for Mobile Health Apps)
- Mobile Health Apps Certifications & Accreditation
SUMMARY!

- As we transition to a digital record framework; use of Mobile Technology leads the way (in access, capture and dissemination of health information)

- As Mobile & IoT Devices become more and more ubiquitous, accessing our health information is only a few tap/swipe/transmit away!

LIFE IN 21st CENTURY

- Standards enabled, cloud connected, IoT driven, micro-services enhanced, cyber-safe Digital Health world
THANK YOU

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