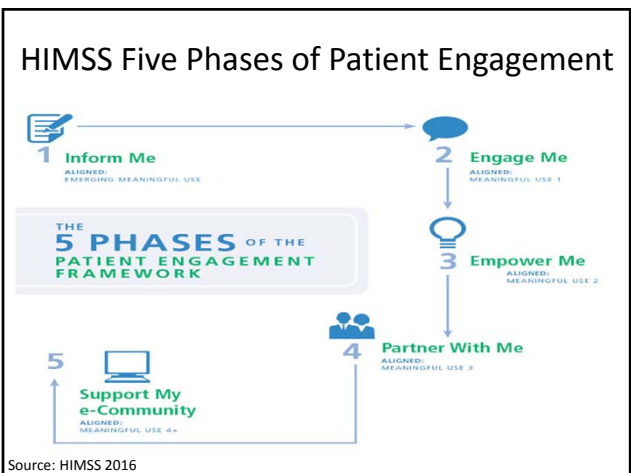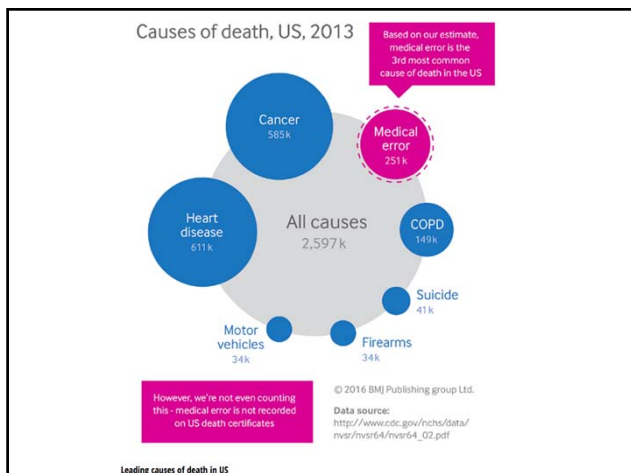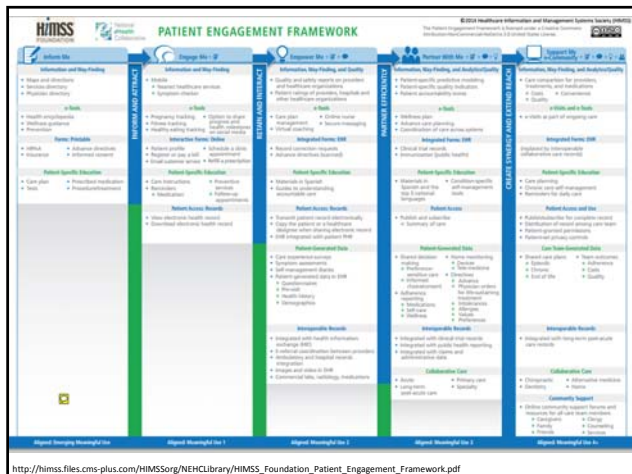## Slide 1

SINI 2016
26th Summer Institute in Nursing Informatics

Informatics at the Crossroads of Care Coordination

July 20-22, 2016
University of Maryland School of Nursing, Baltimore, Maryland

UNIVERSITY of MARYLAND SCHOOL OF NURSING

Enabled, Engaged, and Empowered (E3) Patients: Future of Care Delivery

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Slide 2

Objectives

- Review Federal and Regional initiatives promoting Patient Engagement
- Review best practices related to Patient Engagement
- Explore current and emerging patient engagement technologies
- Discuss the return on investment and outcomes for patients that are engaged in their own healthcare
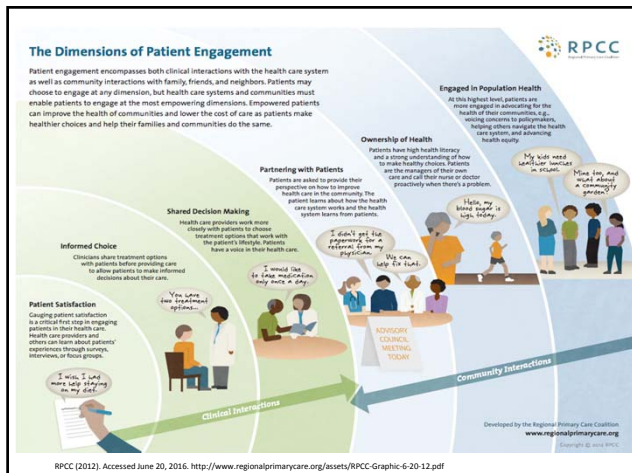
Slide 3

Causes of death, US, 2013

Based on our estimate, medical error is the 3rd most common cause of death in the US

Cancer 585k

Medical error 251k

Heart disease 611k

All causes 2,597k

COPD 149k

Suicide 41k

Motor vehicles 34k

Firearms 34k

However, we're not even counting this - medical error is not recorded on US death certificates

© 2016 BMJ Publishing group Ltd.
Data source:
http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf

Leading causes of death in US

Slide 4

HIMSS Five Phases of Patient Engagement

THE 5 PHASES OF THE PATIENT ENGAGEMENT FRAMEWORK

1 Inform Me
ALIGNED: EMERGING MEANINGFUL USE

2 Engage Me
ALIGNED: MEANINGFUL USE 1

3 Empower Me
ALIGNED: MEANINGFUL USE 2

4 Partner With Me
ALIGNED: MEANINGFUL USE 3

5 Support My e-Community
ALIGNED: MEANINGFUL USE 4+

Source: HIMSS 2016

http://himss.files.cms-plus.com/HIMSSorg/NEHCLibrary/HIMSS_Foundation_Patient_Engagement_Framework.pdf

Meaningful Use Phase 3: Identification of Key Engagement Priorities

① Increase from 5 to 25% of patients reviewing, downloading and transmitting their personal data

② >35% of all patients seen by a provider or discharged from the hospital will receive a secure electronic message via the electronic health record (EHR) or in response to a secure message sent by the patient

③ >15% of patients to contribute to patient-generated health data or data from a non-clinical setting to integrate in the EHR.

Connecting health and care for the nation. The office of the national coordinator for healthcare information technology (2015). 1-163. Accessed June 20, 2016. http://healthit.gov/sites/default/files/nationwide-interoperability-roadmap-draft-version-1.0.pdf

RPCC (2012). Accessed June 20, 2016. http://www.regionalprimarycare.org/assets/RPCC-Graphic-6-20-12.pdf

Blue Button Initiative

- 2010 Obama Administration
- Initially offered to patients in the VA
- Today has been adopted by 650 organizations, and growing
  - Goals
- Give all patients secure access to their health records
- Allow information to be easily portable to learn more about medical history and/or transition between providers.

Healthit.gov 2016
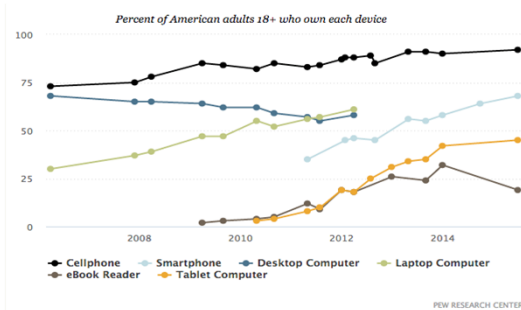
Patient-Centered Care

- Move to patient-centric healthcare
- Patient is at the center of his experience and controls the environment.
- Use of many tools to connect the patient to the healthcare arena
  – Mobile apps
  – Wearable devices
  – Social media
  – Portals- personal health record, EHR
  – Interoperability
  – Internet Sites
- More Data exchange and availability of data in one location
- Tools to help patient's manage their healthcare information

Dr. Charlotte Hovet, MD, Medical Director of Global Healthcare Solutions, Dell Services/Healthcare and Life Sciences. Dec. 2, 2014
from New Mandates, New Solutions: The Evolving Roles of the CMIO and Clinical Informatics Team- Slide 8-10
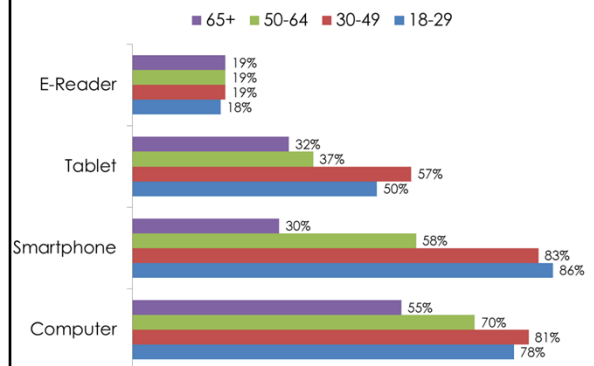

Empowering and Enabling Technologies

12

% of Device Ownership

Percent of American adults 18+ who own each device

PewInternet.org (2015)

2015 Tech Device Ownership by Age
■ 65+ ■ 50-64 ■ 30-49 ■ 18-29

E-Reader
- 19%
- 19%
- 19%
- 18%

Tablet
- 32%
- 37%
- 57%
- 50%

Smartphone
- 30%
- 58%
- 83%
- 86%

Computer
- 55%
- 70%
- 81%
- 78%

Source: Pew Research Center, "Technology Device Ownership: 2015."   www.CreatingResults.com

Top 5: What Do Seniors Want?

3.9 million reaching 65 years old in 2015

2-in-3 want technology to access care from home

Are we ready?

Self-care tools to manage health needs remotely

Wearables to monitor symptoms and vitals

Online communities for seeking advice from peers

Navigating health needs with help from a patient navigator

Health record tools to access outcome-related data (e.g. labs)

Seniors Describe Smartphones as "Freeing"

Older Adults Most Likely Age Group to Describe Their Smartphone as 'Freeing,' 'Connecting'

% of U.S. smartphone owners who say that the following items from each pair describe how they feel about their phone

	Leash	Freedom
Total	30	70
18-29	36	64
30-49	32	68
50-64	22	77
65+	18	82

	Distracting	Connecting
Total	28	72
18-29	37	63
30-49	29	71
50-64	18	81
65+	18	82

Pew Research Center American Trends Panel survey, Oct. 3-27, 2014.

PEW RESEARCH CENTER

PewInternet.org (2016)

Consumers of all ages are accessing their EHR, and they know more about the data that is available to them than two years ago

More US consumers with EHRs are accessing their records, 45% in 2016 vs. 27% in 2014 (see Figure 1). Health technology users age 65-74 are most likely to have turned to their EHRs to manage their health (38% did so in 2016 vs. 22% of those 18-34) (see Figure 2).

FIGURE 1. More US consumers with electronic health records are accessing their records

2014 — 27
2016 — 45

FIGURE 2. Health technology users age 65-74 are most likely to have turned to their EHRs to manage health

38% vs 22

Top Users (Ages 65-74)   Least Users (Ages 18-34)

FIGURE 3. Consumers know more about what data they can access in their EHR

FIGURE 4. Data that patients with EHRs find most helpful to health management

Compared to two years ago, healthcare consumers know more about what data they can access in their EHR. In 2016, 65% with EHRs said they know what data they have access to in their EHR vs. 39% in 2014. However, 35% still don't know what information they can access (see Figure 3).

Interestingly, those patients who have accessed their EHR are doing so to stay informed (41%), but not for help with making medical decisions (6%). Among consumers who know what information they have access to, 41% say accessing lab work and blood test results is most helpful for managing health, while 24% say having physician notes is most helpful (see Figure 4).

Doctors and consumers don't always agree on what a patient should access in his/her EHR

Most (92%) patients believe they should have full access to their records, while only 18% of physicians share this belief. Interestingly, about half (49%) of patients believe they have full access (see Figure 5). The perception gap about EHR access has widened in the past two years, a 42% decline in physicians and a 10% rise in patients.

Open Notes

Open Notes

Impact on Workflow

	Expectations (%)	Post-intervention (%)
Visits significantly longer	24	2
More time addressing patient questions outside of visits	42	3
More time writing/editing/ dictating notes	39	11

…and, compared to the year preceding the intervention, the volume of electronic messages from patients did not change

— OpenNotes research published in *Annals of Internal Medicine*

eHealth Programs:

Inpatient Setting

- Engage patients in their care while they are in the hospital
- Robust patient education library including videos and content on various health topics
- Information therapy / Information prescription
- **Expected outcomes: Efficient and quality care**
  - Higher quality care
  - Improved Patient Satisfaction
  - Provide patients with options
  - Proactive active care
  - Save clinicians' time

Inpatient Engagement System

Source: GetWellNetwork (http://www.getwellnetwork.com)

Patient Education

- Interactive
- Pre-Admit- Auto assigned based on procedures scheduled
- Inpatient- Ordered by the RN through the EHR
- Ambulatory- Ordered by staff to be viewed at home.

Challenges with patient engagement- related technology

- Adoption- by patients
- Disparate systems- not a single unified experience
- Language concerns
- Device lifecyle
- Nursing Challenges
  - Increased workload
  - Patient identification- correct patient access
  - Confusion/Lack of knowledge about the portal content and functionality.

Endless Online Resources
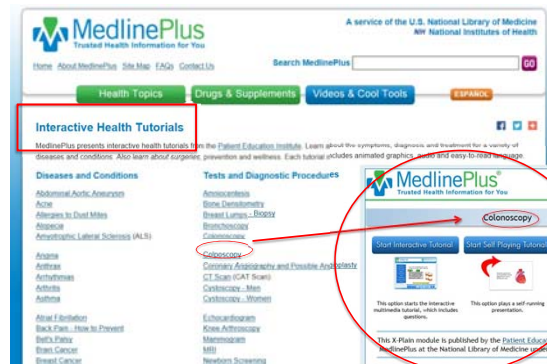

Source: National Library of Medicine (2016)

Current Status of HIT Programs for Consumers

- eHealth programs
  - Health information / educational websites
  - Personal health records
  - Patient portals
- mHealth programs
- Adaptive technologies
- Sensor technologies
- Etc.

Stanford Health Care Launches Custom Mobile App That Connects to Epic EHR and Lets Patients Manage Their Care on the Go
Stanfordhealthcare.org 2016

The new iOS 8 app, called MyHealth, integrate with Epic and with Apple HealthKit. Although Epic itself is integrating with Apple, and many hospitals rely on Epic's MyChart app and portal for patient engagement, Stanford president and CEO Amir Dan Rubin suggested that Epic's out-of-the-box app wouldn't cut it for the hospital.

Mobihealthnews.com 2016
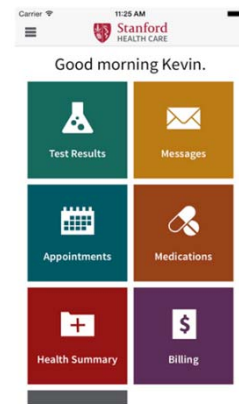
eHealth Programs

Outpatient Clinics and Communities

- Government health websites
  - NIH, NLM, USDA, etc. (e.g., MedlinePlus, ChooseMyPlate.)

- Health professional websites
  - American Cancer Society
  - National Osteoporosis Foundation

- Private sector websites
  - PatientLikeMe
  - WebMD
  - SparkPeople
  - YouTube!

Consumers' use of apps and wearables has doubled, and both doctors and patients agree there are benefits
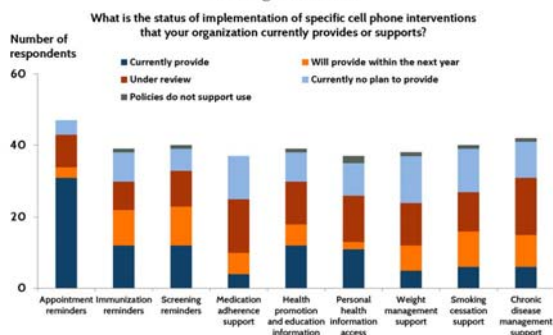
Use of health apps has doubled in the past two years (33% in 2016 vs. 16% in 2014) among consumers who use technology to manage their health. Use of health wearables has also doubled (21% in 2016 vs. 9% in 2014) (see Figure 8). The use of social media has increased from 14% to 21%.
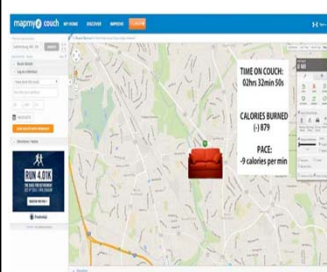
Source; Accenture 2016

0

Mobile Apps

Exhibit 2. Implementation Status of Cell Phone Interventions Among Providers

What is the status of implementation of specific cell phone interventions that your organization currently provides or supports?

Source: Patient Engagement and Mobile Health in the Safety Net Survey, 2013.

Map My Couch!

GomerBlog.com (2016)

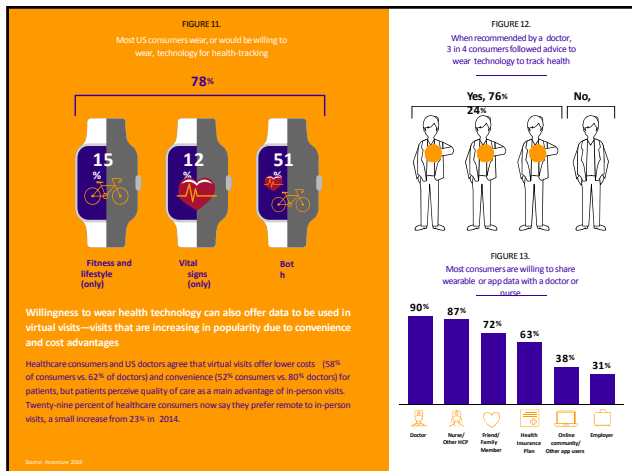## Fitness Apps

Consumers are willing to track their health using digital tools, and share the data with healthcare professionals

The majority (78%) of healthcare consumers wear or are willing to wear technology to track their lifestyle and/or vital signs (see Figure 11). Of consumers who were asked by a doctor to wear technology to track their fitness and lifestyle (18%) or vital signs (19%), roughly three-fourths (76%) of patients followed the physician's recommendation (see Figure 12).

Most consumers are willing to share wearable or app data with a doctor (90%) or nurse (87%)—and 40% of health app users have already done so. Willingness to share wearable or app data drops when it comes to health plans (63%) or employers (31%) (see Figure 13).

FIGURE 11.
Most US consumers wear, or would be willing to wear, technology for health-tracking

78%

| 15% | 12% | 51% |
| Fitness and lifestyle (only) | Vital signs (only) | Both |

Willingness to wear health technology can also offer data to be used in virtual visits—visits that are increasing in popularity due to convenience and cost advantages

Healthcare consumers and US doctors agree that virtual visits offer lower costs (58% of consumers vs. 62% of doctors) and convenience (52% consumers vs. 80% doctors) for patients, but patients perceive quality of care as a main advantage of in-person visits. Twenty-nine percent of healthcare consumers now say they prefer remote to in-person visits, a small increase from 23% in 2014.

Source: Accenture 2016

FIGURE 12.
When recommended by a doctor, 3 in 4 consumers followed advice to wear technology to track health

Yes, 76%   **No, 24%**

FIGURE 13.
Most consumers are willing to share wearable or app data with a doctor or nurse

Doctor	Nurse/Other HCP	Friend/Family Member	Health Insurance Plan	Online community/Other app users	Employer
90%	87%	72%	63%	38%	31%

Gamification: The Avatar Will See You Now

Medical centers are testing new, friendly ways to reduce the need for office visits by extending their reach into patients' homes.

Receiving remote medical care is becoming more common as technologies improve and health records get digitized. Sense.ly, the California startup running the trial, is one of more than 500 companies using health-care tools from Nuance, a company that develops speech-recognition and virtual-assistant software. "Our goal is basically to capture the patient's state of mind and body," says Ivana Schnur, cofounder of Sense.ly and a clinical psychologist who has spent years developing virtual-reality tools in medicine and mental health.

Lieber, Jessica. (2013). The Avatar Will See You Now. Business News, June 10, 2013.
http://www.technologyreview.com/news/514881/the-avatar-will-see-you-now/

Sense.ly

MANAGE YOUR PATIENTS BETTER
efficient. simple.

Patients sign up with Sensely with the click of a button – at home, or at their care facility. Sensely follows up with a personalized care plan, allowing clinicians to seamlessly monitor risk factors and adjust clinical protocol as needed. Patients check in with the nurse avatar periodically, based on care plan parameters, and Sensely triggers clinician action as needed.

Clinician gets alerted if risks have increased or stay high

Patient follows prescribed regimen and monitoring

Clinician follows up via video or coordinates specialist

Patient is discharged and enrolled in Sense.ly

Patient keeps getting better, clinician gets reimbursed

http://sense.ly/

See a Provider via Tablet or Smartphone?

PROVIDENCE Health & Services | SWEDISH

Health eXpress

$39 Doctor Visit Online

Live, on-demand doctor visit from your smartphone, tablet or computer.

Get diagnosis and treatment recommendations.

Don't need a visit today? Be ready when you need it.

http://get.healthexpress.com/

One Size Doesn't Fit All The Tailored Approach

"It is more important to know what sort of person has a disease than to know what sort of disease a person has" Hippocrates

Telehealth

– The delivery of patient care, consultations and education supported by telecommunications technologies, via live interactive videoconferencing, store and forward technologies, remote patient monitoring, mHealth

- Telemedicine
  – Virtual visits, eVisits, Direct to consumer health
- Telehealth
  – Broader term that describes remote healthcare that does not always involve clinical services
  – Connected Care, Virtual Care, eHealth, & Digital Care
- Remote Patient Monitoring
  – mHealth, Wearables, Sensors, Fitness Trackers.
- Store and Forward

Why Telehealth?

- Half of all adults have two or more chronic diseases (CDC)
- Chronic disease causes 60% of deaths and makes up 75% of healthcare costs ($7900/person)
- $18 billion/year is wasted on avoidable ER visits

Telehealth brings healthcare to people when and where its needed

- Local Clinic or Hospital
- Workplace
- Schools/Colleges
- Nursing Homes/Assisted Living Facilities
- Correctional Facilities
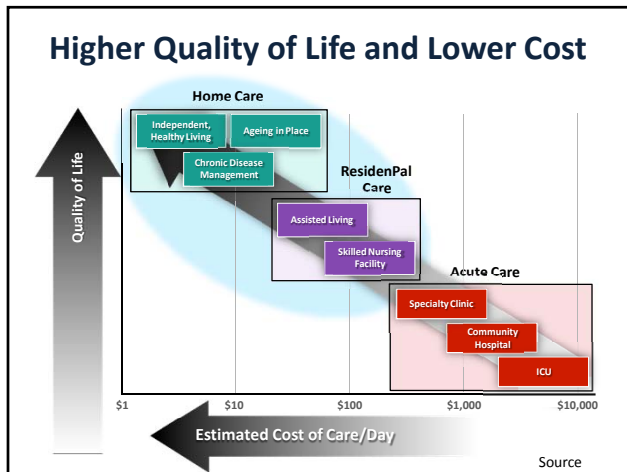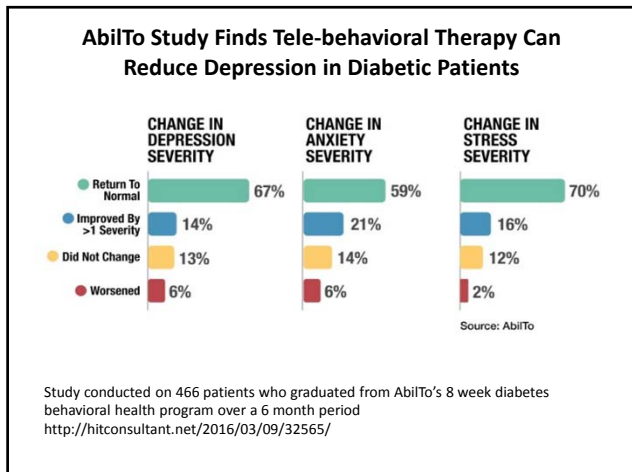- Mobile Health Vehicles
- Shelters, Group Homes

Extending Your Reach

Evidence of Need

- Patients who are not see by a Provider within 1 week of hospital discharge are 7x more likely to be readmitted
- 1 in 5 Medicare patients (2.6 million) are readmitted within 30 days of discharge costing $26 billion a year

Telehealth is Faster

- Bring healthcare to patients
  - Efficient use of resources
  - Ability to share resources for earlier access
- Avoid travel time
- Avoid waiting rooms
- Mobility and access to services
  - On demand/Direct to Consumer (DTC)
- Faster Diagnosis

Kristi Henderson, DNP, FNP-C, ACNP-C, FAEN, ANIA Annual Conference, April 2016 Telehealth: The Future of Healthcare Disrupt or Be Disrupted- Slides #'s

Improved Access with Technology
Telemedicine
RPM
Virtual Visits

AbilTo Study Finds Tele-behavioral Therapy Can Reduce Depression in Diabetic Patients

	CHANGE IN DEPRESSION SEVERITY	CHANGE IN ANXIETY SEVERITY	CHANGE IN STRESS SEVERITY
Return To Normal	67%	59%	70%
Improved By >1 Severity	14%	21%	16%
Did Not Change	13%	14%	12%
Worsened	6%	6%	2%

Source: AbilTo

Study conducted on 466 patients who graduated from AbilTo's 8 week diabetes behavioral health program over a 6 month period
http://hitconsultant.net/2016/03/09/32565/

Higher Quality of Life and Lower Cost

Source

Banner Health

Transforming from an acute hospital system to a populaTon health enterprise

2014 Impact:

1,890 lives
esTmated saved, as reported (comparing to benchmark data)

$109M+ saved

45,861
fewer hospital days

46,435
fewer ICU days than predicted

Managing populations over the year

- Introducing visibility into the **white** space…

- Hospital stay – shorter or avoided Home healthcare – 30–60 days

In the *white space*, up to 25% of the frail and elderly populaTon will move to higher risk yearly

Visibility to who and when provides opportunity for intervenTon

Real-Tme alerts of who is at risk for admission in any upcoming month

PotenTal clinical interacTons

Slide 1: Donna - 82 yr old female

Donna - 82 yr old female

DRs Appointments
DVT/PE on anTcoagulaTon
Wife   INR   Diet   Daily medication
Exercise
Mother   HTN
Daily medication   DRs Appointments
Grandmother   CAD
Labs   Daily medication
Worried About Her Family   Diet
Exercise
DRs Appointments
Scared   PVD
Feeling Hopeless   INR   Daily medicaTon
Daily me   Hypothyroidism
Frequent Labs
Thyroid Nodule S/P RadiaTon   OA, Osteoporosis   Exercise
INR   Diet
Spends all her energy visiting the doctor   Cocci MeningiTs Requiring Lifelong Fluconazole
Her family feels at a loss trying to coordinate her care   Compression Fractures   Daily medicaTon
Exercise   DRs Appointments
Diet
DRs Appointments   Labs
INR

Slide 2: Banner iCare™

Banner iCare™

Primary Care
- Primary Care Provider
- Office Team

Home
- PaTent & Caregiver

Mobile Team
- Home Health Nurse
- Health Coach

Telehealth Team
- iPhysician
- iMSW
- iRN
- iPharmacist
- Health Unit Secretary

Slide 3: eCareCompanion – A Tool For Engaging People

eCareCompanion – A Tool For Engaging People

Slide 4: Population Management Tools

Population Management Tools

Avoiding flag overload
- Significant variability in home measurement data
- Need to differenTate acute problem from need for Rx adjustment
- Use of one-Tme thresholds and pa.erns of abnormal results achieve this

10

CCA PaTent Summary

Care activities communicated to the member's tablet

PaTent Timeline – Pa.erns of Care (3.0)

Using Data to Empowering People

Challenges & Lessons Learned

- Changes in program structure ('support model') and member recruitment strategy (inpatient) precipitated need for new processes – large number of new enrollees made this challenging
  - Lesson – need to anticipate consequences of program changes
- Novelty of team-based multi-disciplinary outpatient care model created uncertainty about roles and slowed team maturation
  - Lesson – major investment required to help team master new roles and work together effectively
- Lack of validated workflows and immature software contributed to team inefficiency – reactive vs proactive
  - Lesson – understand challenges inherent in doing new things, provide lots of support, create needed documentation and evolve software as quickly as possible, anticipate slow maturation/cost

Other Learnings

- Scaling from small pilot to mission-critical program requires robust processes; several pain areas now being addressed
  - ▪ Non-clinical operations (equipment deployment and support)
  - ▪ IT support (interfaces, change management)
- Multiple factors delayed availability of credible outcomes data; four part plan in place to address:
  - ▪ Align on definitive claims data source
  - ▪ Define analysis methodology (program start date, relevant sub-groups, comparators)
  - ▪ Create reliable data extract / transfer process
  - ▪ Review data regularly to assure alignment with all stakeholders

Impact

	Pre-enrollment	Banner iCare Members	% Improved
Total Cost of Care per member per year	$32,508	$21,300	34.5%
Pharmacy cost	$1,944	$2,196	-13%
HospitalizaTon Rate per 100 members	10.9%	5.5%	49.5%
Average # hospital days Per 100 members per month	60 days	30 days	50%

January 2016 Intensive Ambulatory Care

Primary care needs a makeover and is closely linked to pervasive chronic disease

Government /employers are making big investments
- • $3.2T spent on medical care each year – 86% on chronic disease
- • Billions of new funding is now allocated to new primary care programs and payment reforms
- • 48% of employers making telehealth a benefit plan option

Consumers are demanding value in their terms
- • 81% of consumers are open to non-traditional care delivery options
- • 54% of consumers won't travel further and 81% won't pay more for best-in-class care
- • Allegiance to one primary caregiver is waning as options grow

Physicians are overextended and not effectively deployed
- • Wait times to see a family practitioner average 19.5 days
- • Only 23% of PCP are satisfied with working at the top of their training
- • 56% believe NP should lead their own patient panels
- • 69% of physicians say retail health clinics improve patient access

Primary care in the New Health Economy: Time for a makeover
PwC Health Research Institute

Five modern models in primary care are evolving

At-your-service care	Convenient care	Digital health	House calls	Independent nurse-led care
Low cost, accessible, highly personalized care without exorbitant fees	On-demand, unscheduled care with transparent pricing located close to the consumer	Technology-driven virtual care to improve care management and disease monitoring	Care delivered within consumer's homes for follow up, chronic disease mgt, and on-demand care	Advanced practice nurses lead their own patient panels and clinics
• Subscription based clinics • Team-based models utilizing technology	• Retail health clinics • Stand-alone urgent care	• DIY care (phone apps, fitness watches) • Telemedicine • Remote monitoring • Biosensors to monitor drug response	• Community paramedicine • On-call providers	• Independent practice settings with no physicians
$40M in venture capital funding raised by a single firm in 2015	*Visits to retail clinics tripled from 2010 to 2014*	*$64 B in traditional care is threatened by DIY and digital health tools*	*Community paramedicine saved CMS $25M*	*Supply of NPs expected to increase by 30% through 2020*

Primary care in the New Health Economy: Time for a makeover
PwC Health Research Institute

Digital health

Virtual visits	Remote monitoring	DIY diagnostics
60%	**$36B**	**50%**
of consumers are open to them	in savings globally over next decade	of consumers want DIY options

- **16%** of physicians are investing in them
- Video visits connect PCPs to specialists, patients to **behavioral health** providers from PCP's office
- Doctor-on-Demand, Plush Care, Teladoc, Alii Healthcare go DTC

- **85%** of physicians say the future PCP will rely more on mobile apps and wearables
- Automated RM data filtering focuses **interventions when and where they are needed** to increase HCP productivity

- **42%** of physicians would rely on certain DIY tests to prescribe medication
- **$64** billion of traditional FFS provider revenue at risk

Primary care in the New Health Economy: Time for a makeover
PwC Health Research Institute

House calls

79% of PCPs think home care will increase

2/3 consumers are interested in receiving care in their own homes

Home visits dropped from **40%** **to just 1%** of all primary care from 1930 - 1950

Chronic disease management

Medication adherence

Follow up care post discharge

Primary care in the New Health Economy: Time for a makeover
PwC Health Research Institute

SINI 2016
26th Summer Institute in Nursing Informatics

Informatics at the Crossroads of Care Coordination

July 20-22, 2016
University of Maryland School of Nursing, Baltimore, Maryland   UNIVERSITY of MARYLAND SCHOOL OF NURSING

Questions?

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