Clinical Informatics: A New Frontier for PAs

Disclosures

- None

Objectives

Learning Objective #1:	Introduction to the emerging field of clinical informatics and the role CI will play in the evolution of healthcare.
Learning Objective #2:	Identify the qualities and competencies of PAs that translate into a clinical informatics role.
Learning Objective #3:	Understand the important role of clinical informatics in realizing optimal team practice and team Efficiencies.

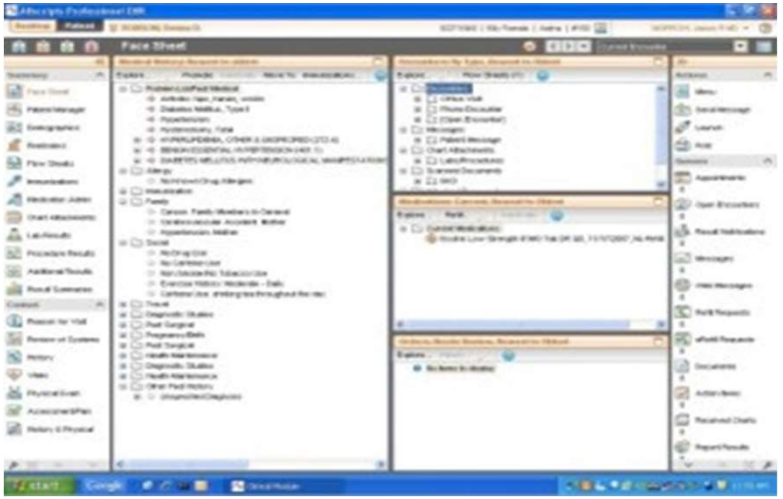
Polling Questions

- Know what EHR stands for?
- How many started practicing or trained on with paper charts?
- Worked with IT or CI on improvement projects or have an informal role working on quality improvement projects?
- Have formal Roles in informatics (protected FTE/Job Description)?
- Who has an interest in a career in Clinical informatics?

We went from…..

To….


Barden, Paul E
Active Problems
Hypercholesterolemia
Essential Hypertension
Hypothyroidism
Current Medications
diltiazem (CARDIZEM CD) 240 MG 24 hr capsule, DAILY
levothyroxine (SYNTHROID) 100 MCG tablet, DAILY
simvastatin (ZOCOR) 40 MG tablet, QPM
Allergies
Penicillins
Ace Inhibitors
Patient Care Team
Drew Walker, M.D.
Family Practice, Internal Medicine
Daniel Niedermeier, M.D.
Dermatology
Immunizations
History
Demographics
Pharmacy
Walgreen's West




ELECTRONIC MEDICAL RECORD SYSTEM


linicalWorks
Progress Notes
Subjective:
Chief Complaint(s):
HPI:
Current Medication:
Medical History:
Allergies/Intolerance:
Gyn History:
OB History:
Surgical History:
Hospitalization:
Family History:
Social History:

Information Sharing and data exchange

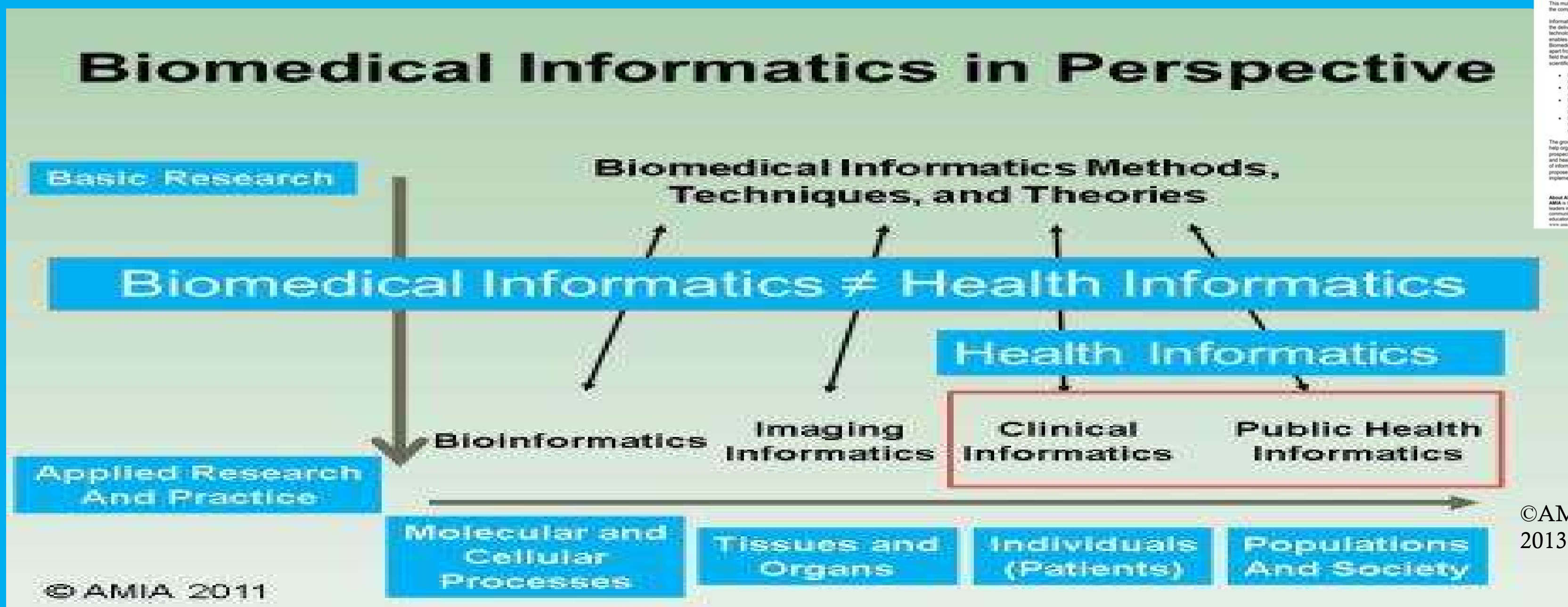
From…..

Information Sharing and data exchange

To….

American Medical Informatics Association Perspective

www.amia.org



INFORMATICS PROFESSIONALS. LEADING THE WAY.

What is Biomedical and Health Informatics?

Introduction

Biomedical and health informatics applies principles of computer and information science to the advancement of life sciences research, health professions education, public health, and patient care. This multidisciplinary and integrative field focuses on health information technologies (HIT), and involves the computer, cognitive, and social sciences.

Informatics is the science of how to use data, information and knowledge to improve human health and the delivery of health care services. Health IT is part of informatics and an essential aspect of AMIA, but technology and technological considerations are only one component of the association's work. Health IT enables advancements in health care by providing the tools with which to set knowledge in motion. Biomedical and health informatics has developed its own areas of emphasis and approaches that sets it apart from other professions and disciplines Biomedical informatics (BMI) is the interdisciplinary, scientific field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving and decision making, motivated by efforts to improve human health.

- BMI develops, studies and applies theories, methods and processes for the generation, storage, retrieval, use, and sharing of biomedical data, information, and knowledge.
- BMI builds on computing, communication and information sciences and technologies and their application in biomedicine.
- BMI investigates and supports reasoning, modeling, simulation, experimentation and translation across the spectrum from molecules to populations, dealing with a variety of biological systems, bridging basic and clinical research and practice, and the healthcare enterprise.
- BMI, recognizing that people are the ultimate users of biomedical information, draws upon the social and behavioral sciences to inform the design and evaluation of technical solutions and the evolution of complex economic, ethical, social, educational, and organizational systems.

The growing role of HIT has created the need to broaden and deepen the pool of workers who are able to help organizations deal effectively with their investment in information technology and, thus, enhance the prospects for major improvements in the safety, quality, effectiveness and efficiency of care. Biomedical and health informaticians understand the workflow of organizations as well as the potential and limitations of information technology. Informaticians conduct research and apply findings to improve processes and propose solutions to technical, clinical, and organizational challenges hampering successful technology implementations.

About AMIA

AMIA is the center of action for more than 4,000 health care professionals, informatics researchers and thought leaders in biomedicine, health care and science. AMIA is an unbiased, authoritative source within the informatics community and the health care industry. AMIA and its members are transforming health care through trusted science, education and practice in biomedical and health informatics.

www.amia.org

Definition

Clinical Informatics is the field that promotes the understanding, integration, and application of information technology in healthcare settings

Innovation in Technology – what's coming next

Mobile Technology and Remote Monitoring

Basic models of TeleHealth

Synchronous

- Live, bi-directional interaction between a patient and care provider
- E.g., video conferencing, patient or provider consultation, health education & training

Store-and-forward

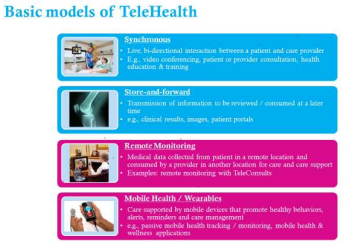
- Transmission of information to be reviewed / consumed at a later time
- e.g., clinical results, images, patient portals

Remote Monitoring

- Medical data collected from patient in a remote location and consumed by a provider in another location for care and care support
- Examples: remote monitoring with TeleConsults

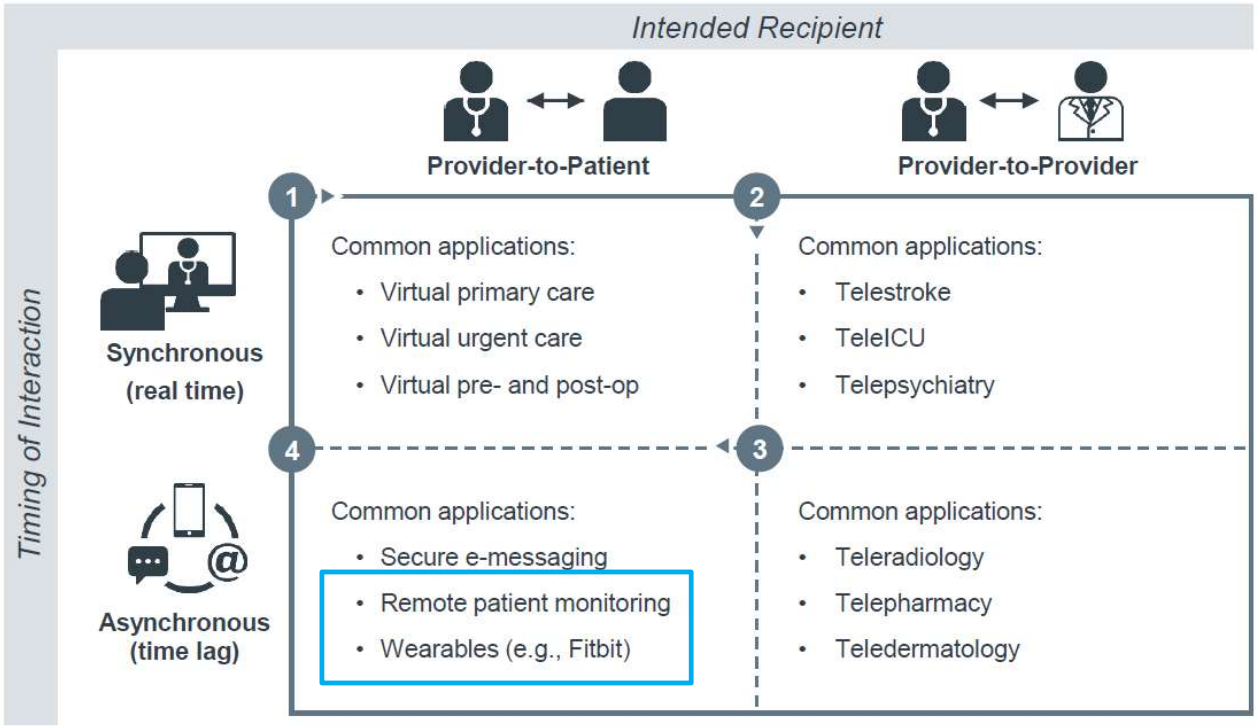
Mobile Health / Wearables

- Care supported by mobile devices that promote healthy behaviors, alerts, reminders and care management
- e.g., passive mobile health tracking / monitoring, mobile health & wellness applications

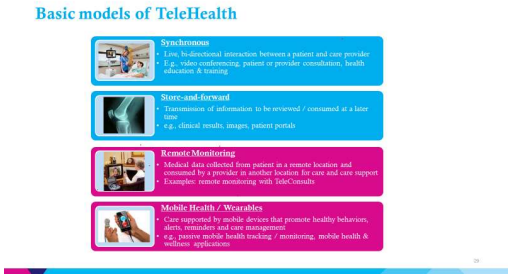


RPM is a Component of Telehealth (Virtual Care)

- Asynchronous
- Provider-to-Patient
- Wearables, Connected Devices and/or Manual Input



Source: Market Innovation Center research and analysis.



mHealth

Mobile health (mHealth) is the "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants and wireless devices"

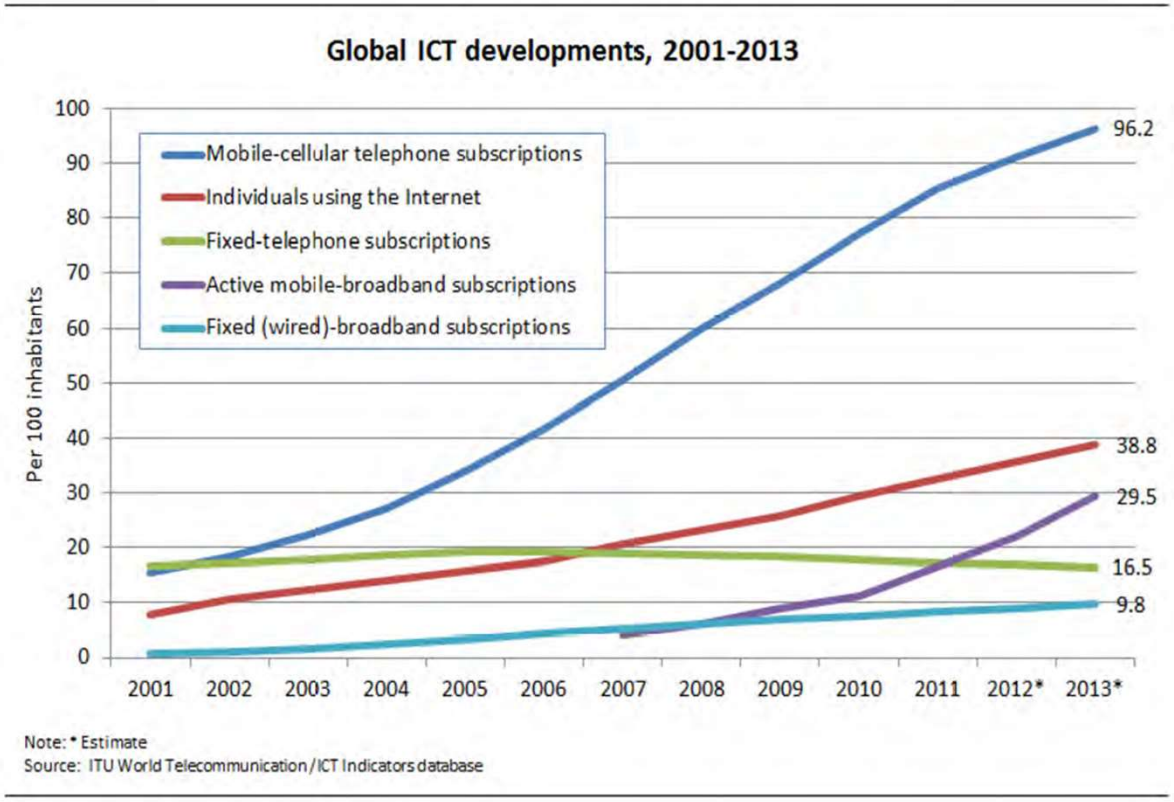
* Mobile technologies, particularly smartphones, are extremely popular with all members of the healthcare team
* Adding to the popularity:
  * Improved speed, memory, wireless connectivity and shrinking form factor (size and shape)
  * Affordable
  * Constantly improving features
  * Phone capability, email and access to Internet
  * A myriad of mobile apps for consumers and clinicians

Wow! That happened fast

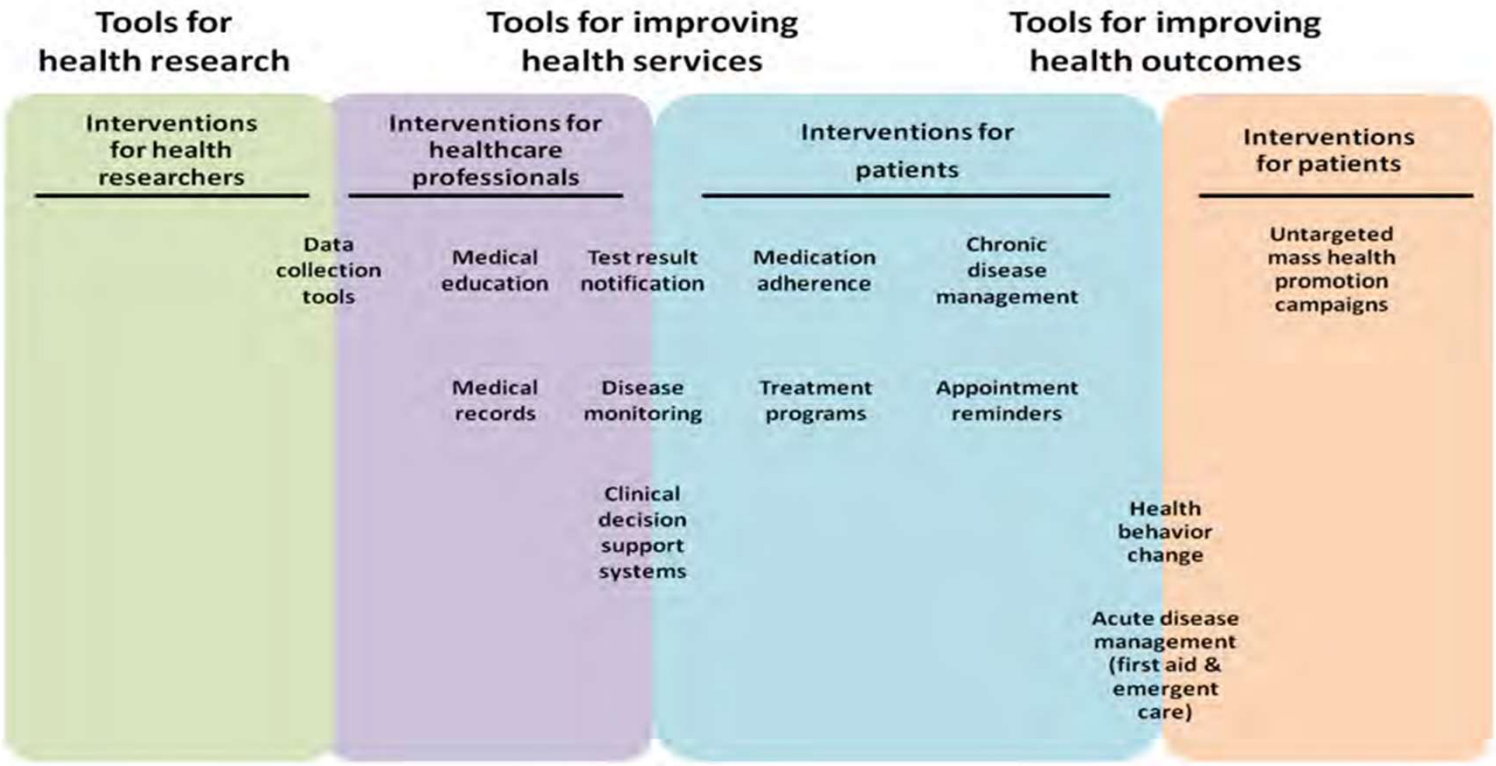
1990 1996 1999 2000's

Evolution of Mobile Technology

* 2G in 1990
* 3G in 2001
* 4 G in 2006
* 5 G ? 2020



mHealth Conceptual framework



mHealth: Tools & Information Accessible Anywhere – patients and providers

- Full function mobile apps are making information and interventions available anywhere
  - iTriage (Aetna, 2011) (shut down in 2018)
    - Personal health record on the phone
    - General and specific medical information
    - Health information library
    - Find facilities and providers
    - Means to influence choices – Featured providers
  - EHR Vendor patient apps - MyChart
    - Patient access to their health record
    - Ability to communicate with care givers
  - Clinician tools – Haiku/Rover
    - Access to records
    - Place orders

Sources: iTriage app, Epic MyChart and Rover apps

Mobile Technology to Track Health Habits and Physiological Signs

* "New" movement ("wearable HIT" and "quantified self")
* New devices and sensors to monitor diet, exercise, sleep, heart rate, respiratory rate, oxygen level, skin temperature, hydration, etc.
* Oriented towards patients
* Communicate with smartphone via Bluetooth LE
* Smart watches - a new platform
  * Heart rate, oxygen level, temperature, EKG, heart rate variability and pulse wave transit time

Engaged Patients: Ongoing & Continuous Monitoring

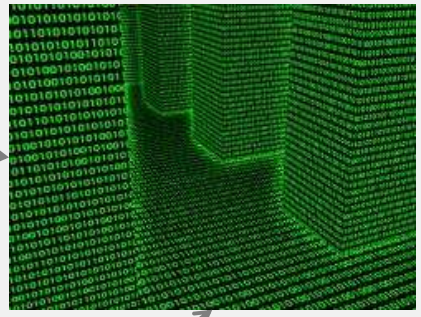
Continuous Capture/
Embedded Analytics

Display/ Monitoring/
Control/ Feedback

Analytics/
Aggregation/ Trends/
Big Data

Scanadu Scout

VisiMobile



Connectedness adds benefits to data collection

Scanadu.com, Soterawireless.com

“Clinical” Connected Devices

Computers or computer interfaces designed to be worn on or implanted in the body

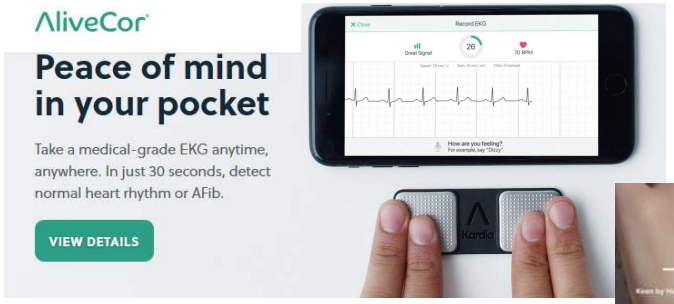
Ranging from smartwatches and fitness trackers to head-mounted displays and exoskeletons

OMRON

Model Number	5 Series Wireless BP7250	Wireless BP HEM- 9210	Body Composition Monitor and Scale BCM-500	Wireless Digital Scale HN-290T	Astute Data Hub CTR-01 Hub
Bluetooth®	✓	✓	✓	✓	✓
Cuff	Wide-Range D-Ring 9”-17”	Extra Large D-Ring 17”-20”			
Power Options	4 AA	4 AA	4 AAA	4 AA	Adapter
Body Weight Range			4.4 to 330 lbs.	88-550 lbs	

Freestyle Libre

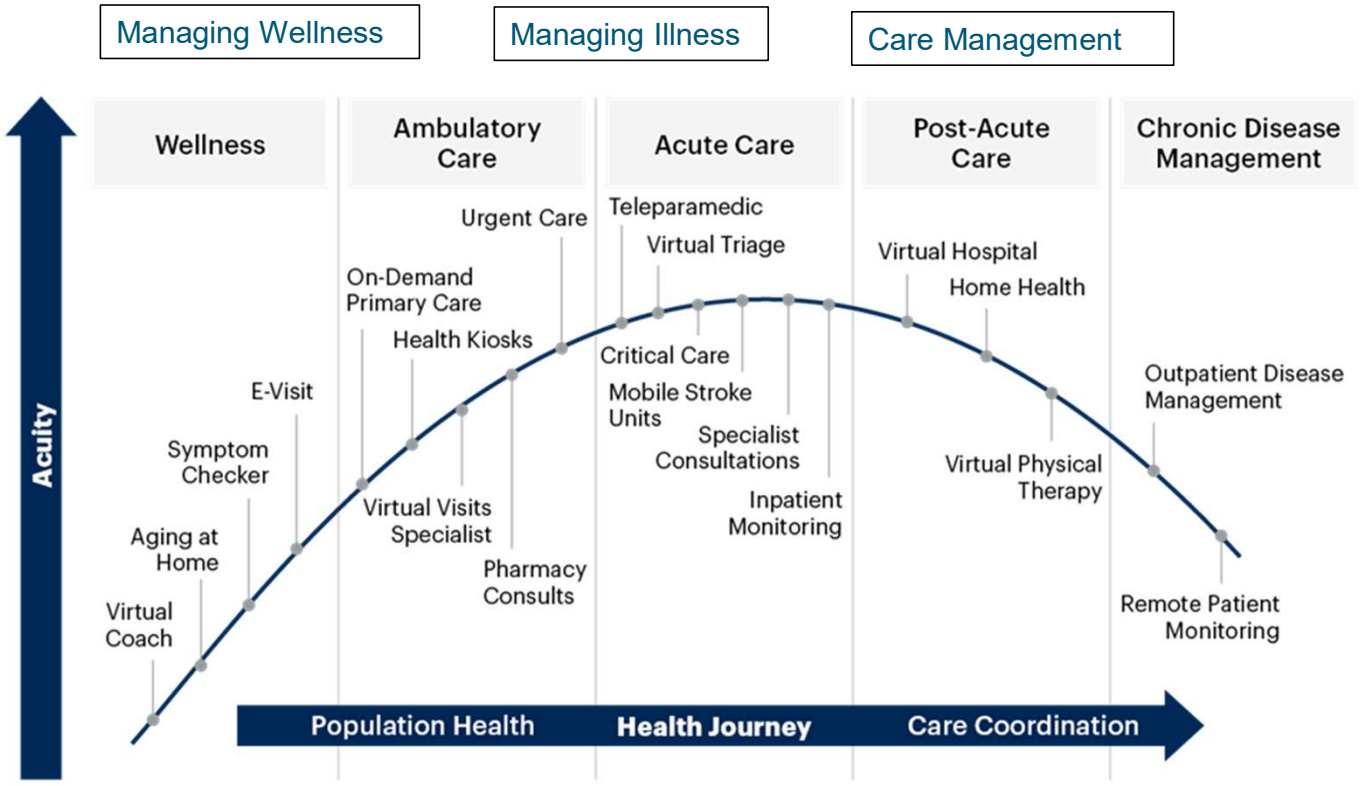
MIR Spirobank Smart Spirometer



Patient Generated Health Data (PGHD)

- **Increased work to have data that can be uploaded, analyzed and archived in an EHR**
- **Reimbursement for the time spent reviewing is still an issue**
- **Should the data be analyzed automatically by machine learning algorithms and posted on a patient dashboard?**
- **Does PGHD change patient behavior?**

Providing Remote Solutions Throughout the Patient's Health Journey are Key to Adopting Consumer-Centric Processes



Source: Gartner

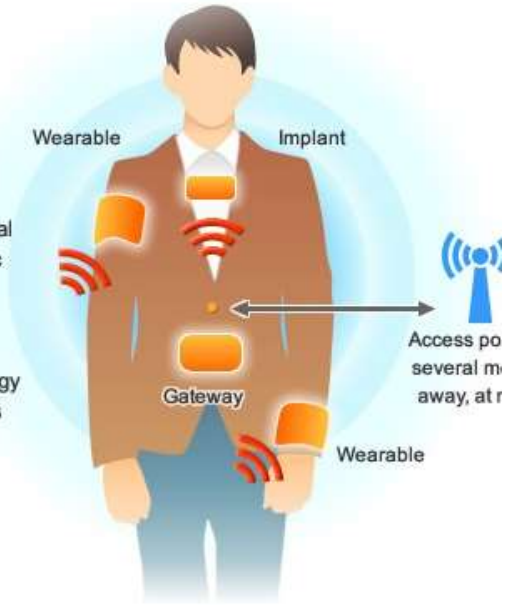
727464_C

Gartner

What's Next….?

Body Area Network (BAN)

- Short-range wireless network for an individual
- Consists of wearable or implanted electronic devices that transmit ID or sensor data to a gateway device.
- Uses either electric-field, electric-current, or electromagnetic communication technology
- Connects to an external access point that is not more than several meters distant



What's Next….?

RPM Can Improve Quality of Life and Access to Care While Decreasing Costs

Supports the Triple **Aim**

- Improves the care experience by offering convenient care at home
- Supports better outcomes through data collection and proactive intervention
- Prevents avoidable emergency utilization and associated costs

Out-of-Office BP Measurements are Clinically Useful

- The diagnosis and management of hypertension have been based primarily on the measurement of BP in the office
- There is mounting evidence that out-of-office BP monitoring is a better predictor of long-term cardiovascular outcomes than office-based BP measurement
- Some studies recommend using out-of-office BP monitoring to confirm the diagnosis, aide in the titration of medications, and to rule out conditions such as white coat hypertension or masked hypertension
- Self-Measured Blood Pressure Monitoring at Home
  - A Joint Policy Statement From the American Heart Association and American Medical Association, (Jun 2020)

https://forumrx.org/commentary/ten-things-every-clinician-should-know-about-the-2017-hypertension-guidelines/

https://www.ahajournals.org/doi/full/10.1161/CIR.0000000000000803

Deaconess Health RPM Program Reduces Cost of Care by $7.4MM

- **Program Evaluation**
  - Evaluate patients 6 months pre-enrollment and post-enrollment to determine program impact
  - They are reducing 30-day readmission and avoiding readmission penalties
    - Focus areas: CHF, COPD, Diabetes
- **Goal is to help patients learn how to take care of themselves**
  - 90 days in avg length of stay on program
  - RPM helped the health system drop its 30-day readmission rate from 14% to 6%

https://www.healthcarenews.com/news/deaconess-health-rpm-program-reduces-cost-care-74-million

Digital Health Can Improve Outcomes for Medicaid Patients with Chronic Conditions, Ochsner Study Says

- **An Ochsner Health study**
  - On the effect of digital medicine and RPM on Medicaid patients with Type 2 diabetes and hypertension who participated in the health system's digital health pilot program
- **The study showed that almost 50% of patients with out-of-control hypertension and 59% of patients with Type 2 diabetes were able to get their conditions under control in 90 days**
  - In Louisiana, 14% of the adult population has diabetes and 40% have hypertension

https://www.beckershospitalreview.com/digital-health/digital-health-can-improve-outcomes-for-medicaid-patients-with-chronic-conditions-ochsner-study-says.html?origin=CIOE&utm_source=CIOE&utm_medium=email&utm_content=newsletter&oly_enc_id=8408C9403078A6S

Many Providers and Staff Are Still Skeptical

- Will this translate into additional work?
- What happens if vitals or alerts are missed?
- What happens when alerts are received after hours and on weekends?
- What are the legal and liability concerns?
- How will I fit these new activities into my existing work when I'm already 150% allocated?

Value of Clinical Informatics

$$\text{Value} = \frac{\text{Quality [Outcomes (ind + pop, mortality + QOL) + Experience (patient + provider)]}}{\text{Cost [Materials + Effort]}}$$

Health Equity

Value of Clinical Informatics

"Health Informatics is the interdisciplinary field that studies and pursues the effective uses of biomedical knowledge data, information, and for scientific inquiry, problem solving and decision making, motivated by efforts to improve human health"

EHR Usability

- The interface between the EHR and a clinician preforms well below other technologies
- Requires devoted time and resources to take advantage of available tools/functionality

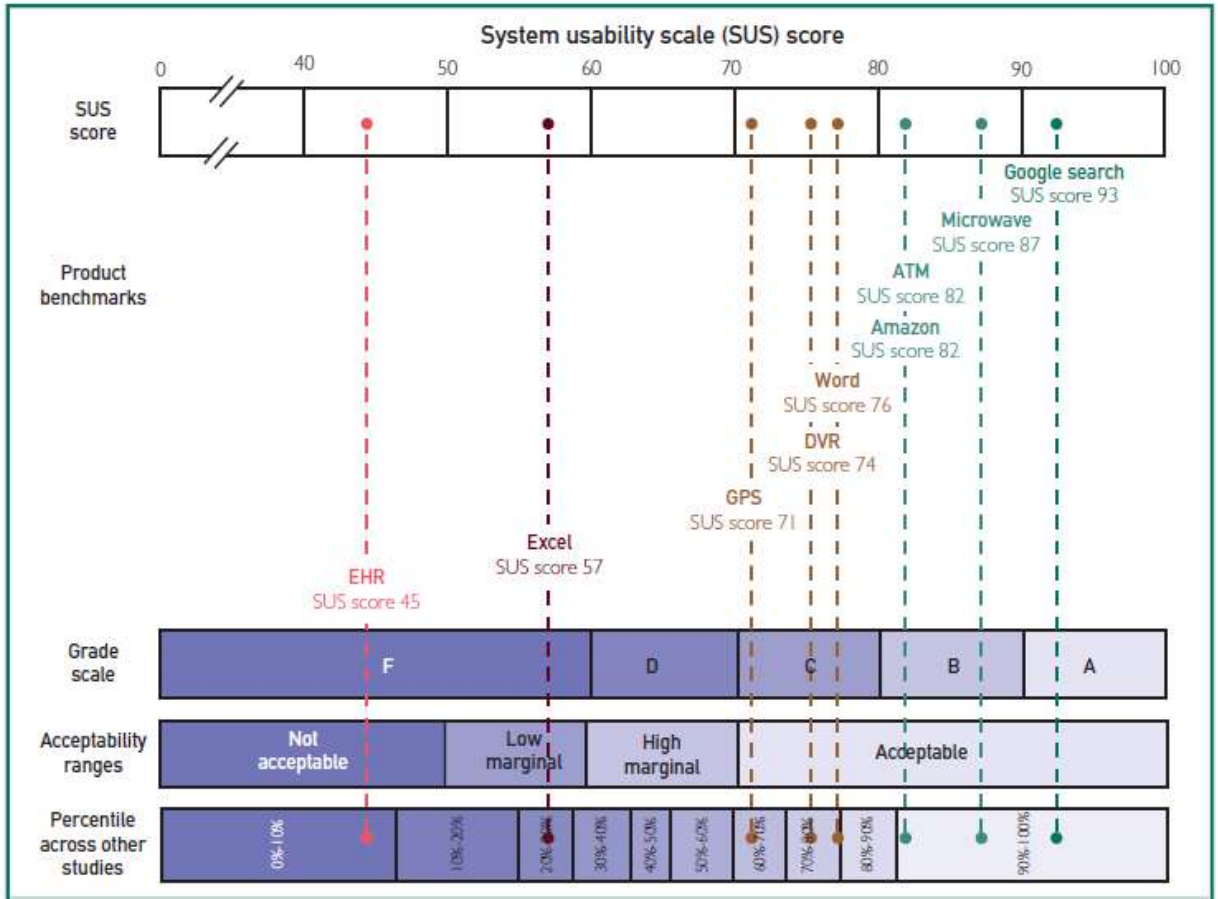


FIGURE 1. System Usability Scale (SUS) score for the electronic health record (EHR) from the analysis reported here and compared across studies in other industries with everyday products mapped onto a grading scale, acceptability ranges, and percentile of scores. ATM = automated teller machine; DVR = digital video recorder; GPS = global positioning system. Figure adapted from: Kortum PT, Bangor A.[24] Usability ratings for everyday products measured with the System Usability Scale. *International Journal of Human—Computer Interaction*. 2013;29(2):67-76.—with permission from Taylor & Francis publishing License Number 4594911446562.

Mayo Clin Proc ■ XXX 2019 ■(■):1-12 ■ https://doi.org/10.1016/j.mayocp.2019.09.024

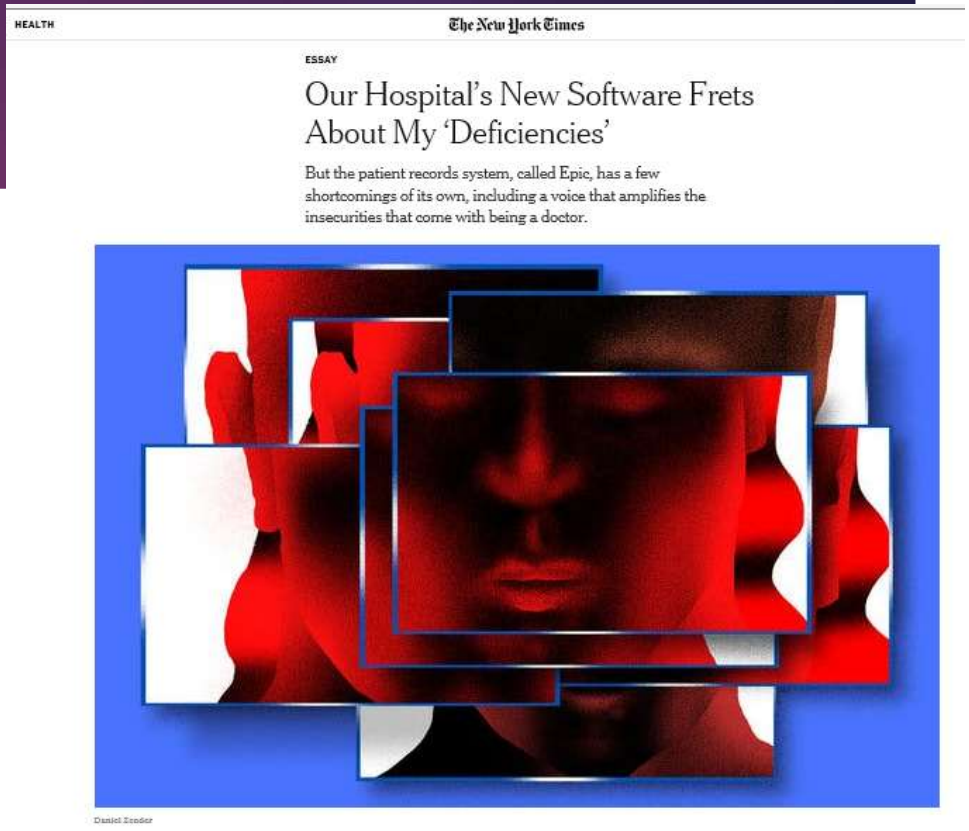
Impact of the EHR on Clinicians

Causes of provider burnout related to the use of EHRs:

- EHRs' documentation and related tasks
- EHRs' poor design
- Workload
- Overtime work (PJ time)
- Inbox alerts
- Alert fatigue

Consequences of provider burnout:

- Low-quality care
- Behavioral issues,
- Mental health complications,
- Substance abuse,
- Career dissatisfaction,
- Costly turnover,
- Decline in patient safety and satisfaction


HEALTH

The New York Times

ESSAY

Our Hospital's New Software Frets About My 'Deficiencies'

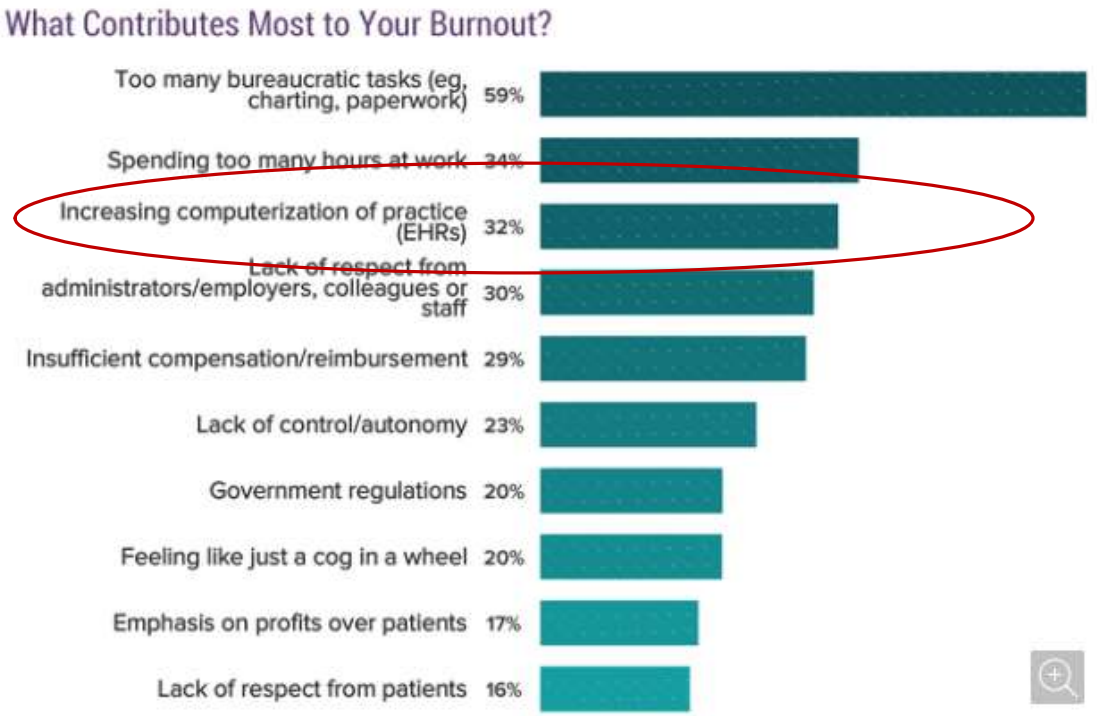
But the patient records system, called Epic, has a few shortcomings of its own, including a voice that amplifies the insecurities that come with being a doctor.

Daniel Zender

https://www.nytimes.com/2019/11/01/health/epic-electronic-health-records.html published 11/1/19

EHR is the Ticket to Provider Wellness?

- Cognitive Overload → Clinician Burnout
  - Use of Electronic Health Records is a major driver of physician/APP dissatisfaction
  - 50% more time than the patient visit
  - 32% of physicians chose EHRs as the top contributor to their burnout [2]
- Physician burnout costs the U.S. health care system $4.6 billion a year [1]



[1] Han S, Shanafelt TD, Sinsky CA, et al. Estimating the Attributable Cost of Physician Burnout in the United States. Ann Intern Med. 2019;170:784–790. [Epub ahead of print 28 May 2019]. doi: https://doi.org/10.7326/M18-1422

[2] sdf Medscape National Physician Burnout, Depression, & Suicide Report 2019

KLAS ARCH Collaborative
EHR Experience Pillars of Success

EHR House of Success Metrics

	Do you agree...
Ongoing Education	• Overall, ongoing EHR training/education is helpful and effective
Meets Unique User Needs	• This EHR has the functionality for my specific specialty/clinical care focus
Shared Ownership	• Our organization has done a great job of implementing, training on, and supporting the EHR
Reliability	• This EHR is available when I need it (has almost no downtime)
Response Time	• This EHR has the fast system response time I expect

https://klasresearch.com/archcollaborative

Clinical Informatics Initiatives

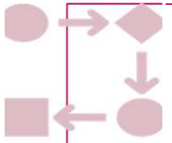
Clinical Informatics **Is Not** IT

Informatics includes the use of IT, change management, human computer interactions, risk management, organizational behavior, workflow redesign, computable language, productivity improvement, safety, quality, evaluation, etc.

Enhancements

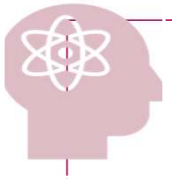
Personalized Training

Thrive Efficiency Training



Re-imaging Workflows

Clinical Decision Support



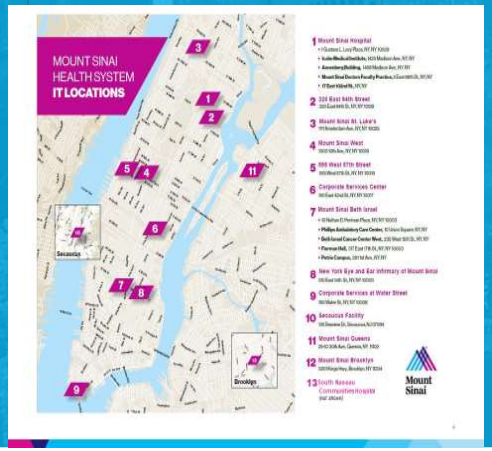
Usability and Human Centered Design

Mount Sinai Health System

42,000
Employees

7,300
Physicians

8 Hospitals



1 Leading Medical School

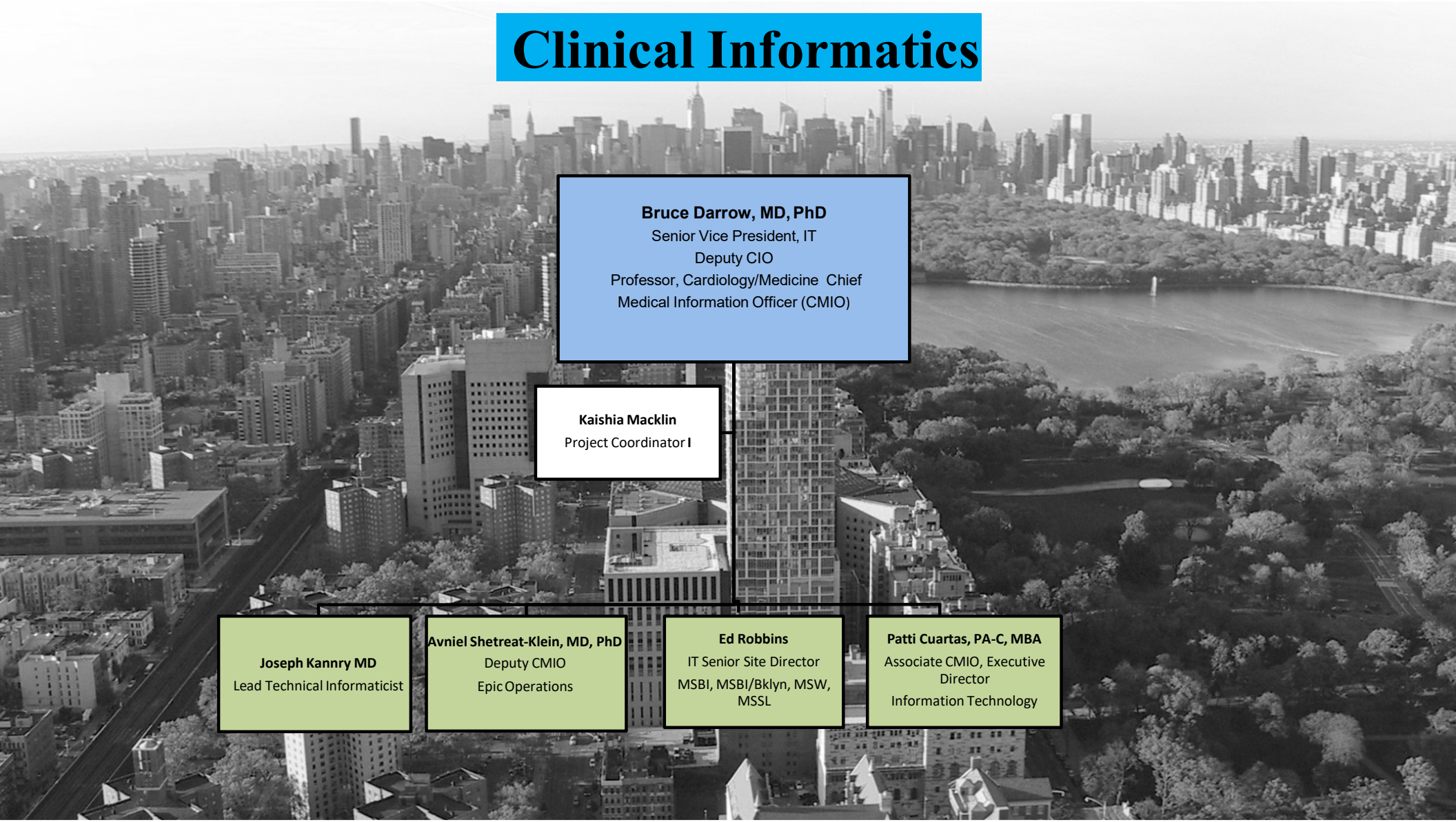
Icahn School of Medicine at Mount Sinai

4.1M
Patient Visits Annually

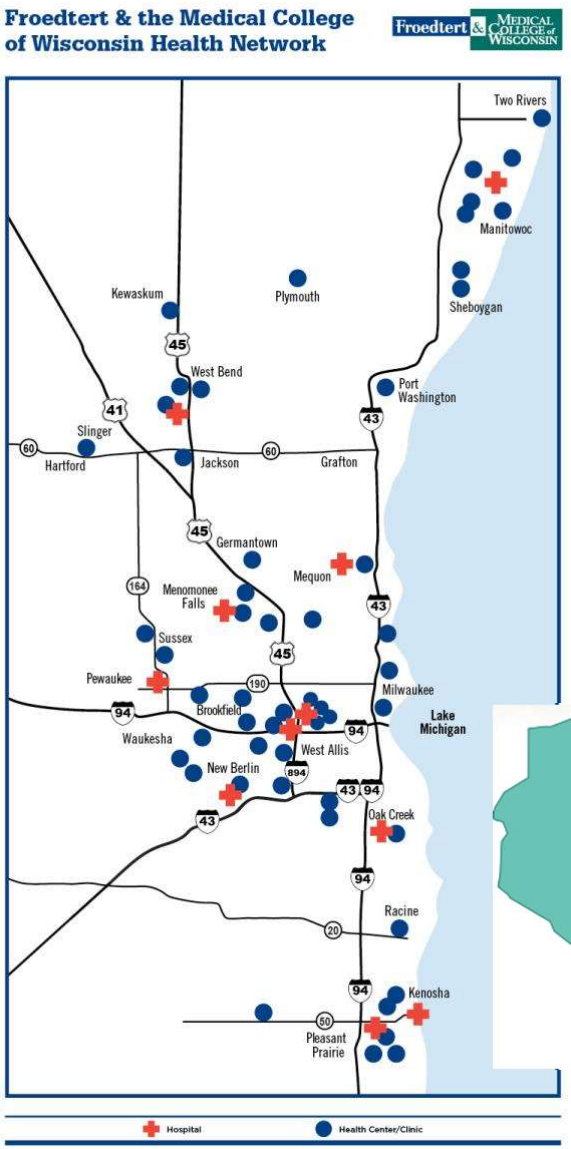
$9B
Revenue Annually

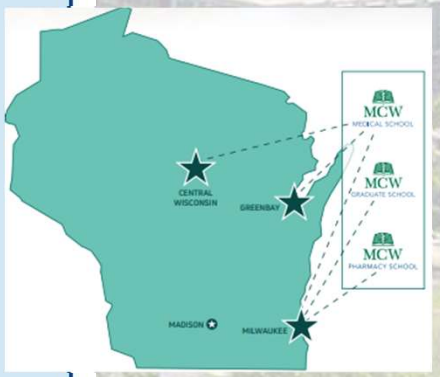
+400
Network outpatient practices

Clinical Informatics



Froedtert & MCW





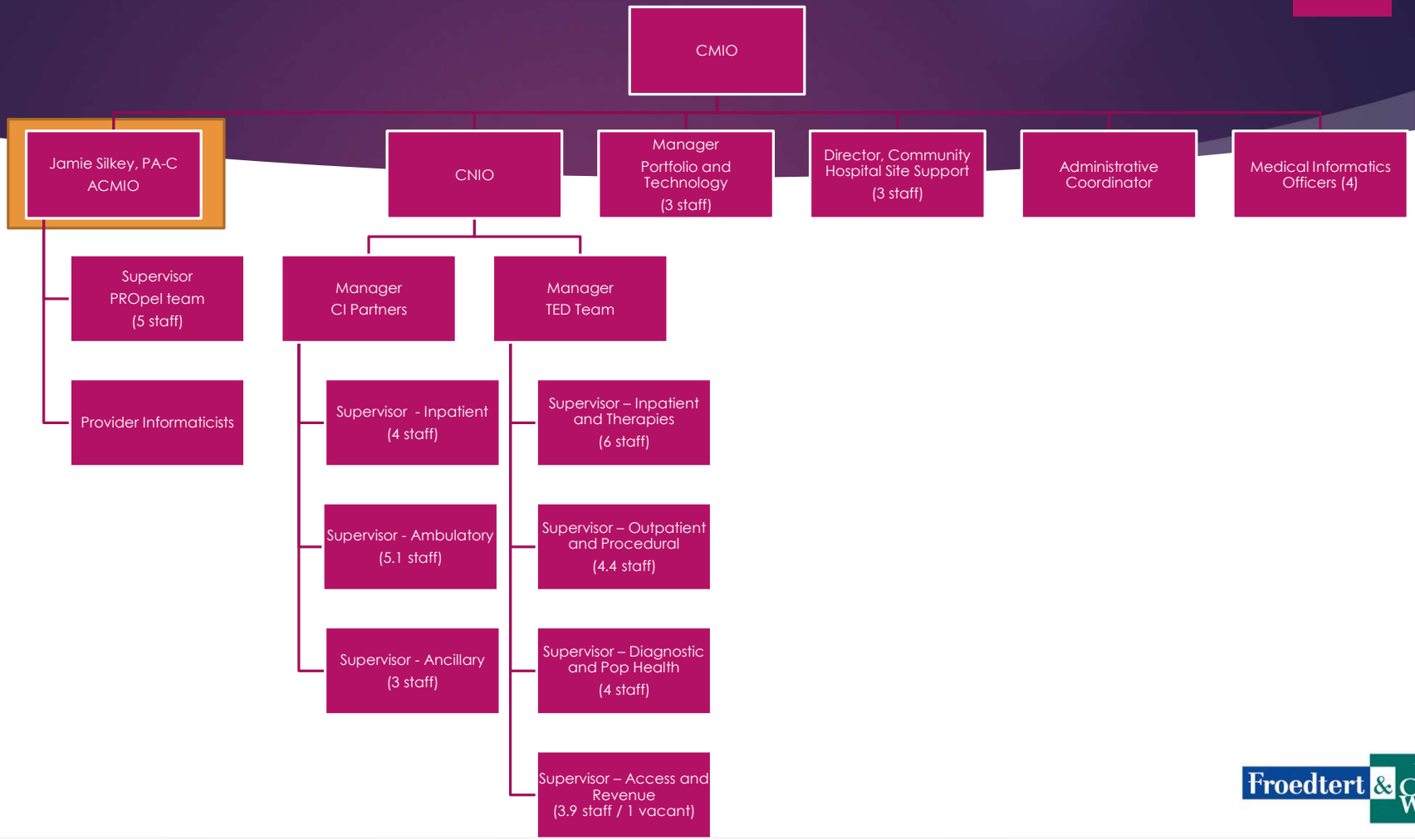
Vital Statistics

As of June 30, 2022

Beds 1,266	Patient Days of Care 322,626	Emergency Visits 194,671	Clinics 45
Physician Clinic Visits 1,172,710	Patient Admissions 58,056	Outpatient Visits 1,709,484	Hospitals 10
Physicians 2,100	Nurses 4,526	Staff and Employed Physicians 16,974	APPs 650

Froedtert & Medical College of Wisconsin

F&MCW Enterprise Clinical Informatics

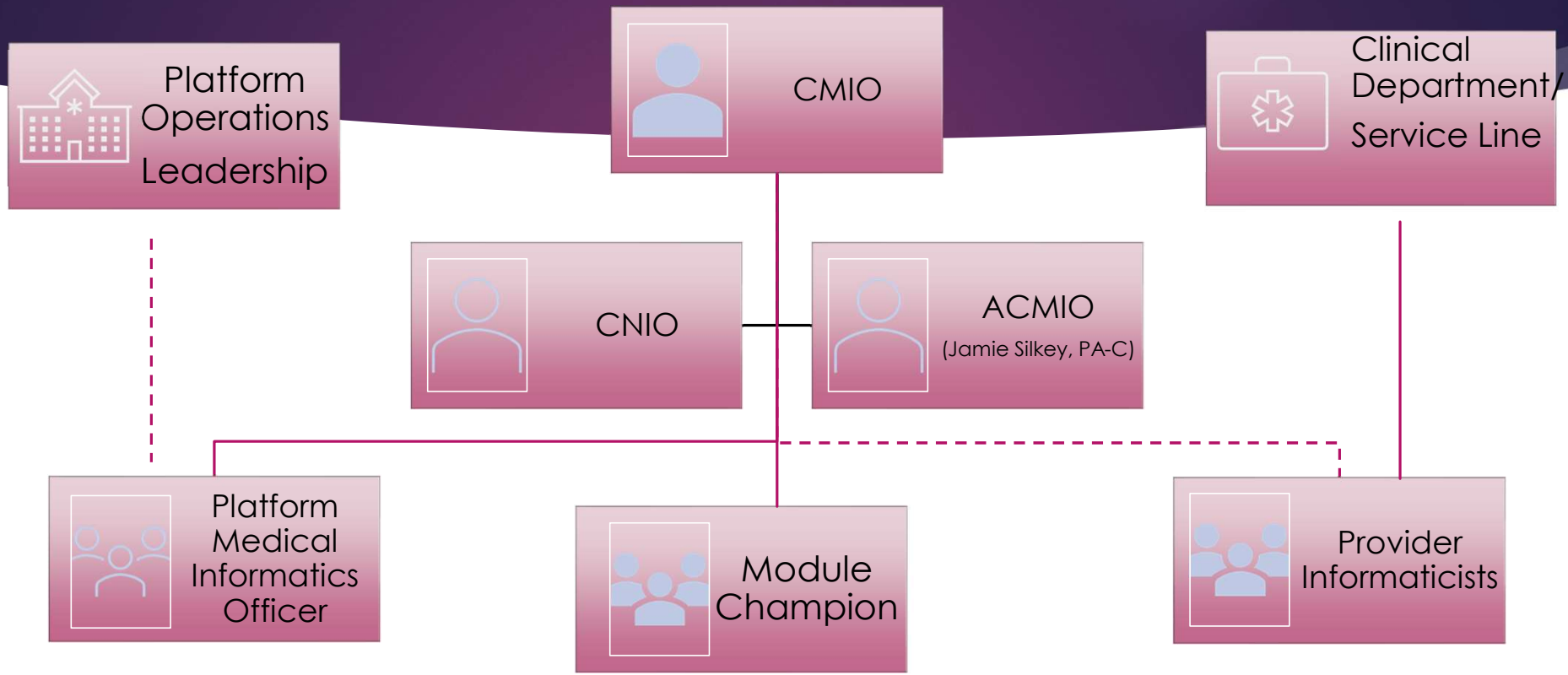


Froedtert & Medical College of Wisconsin

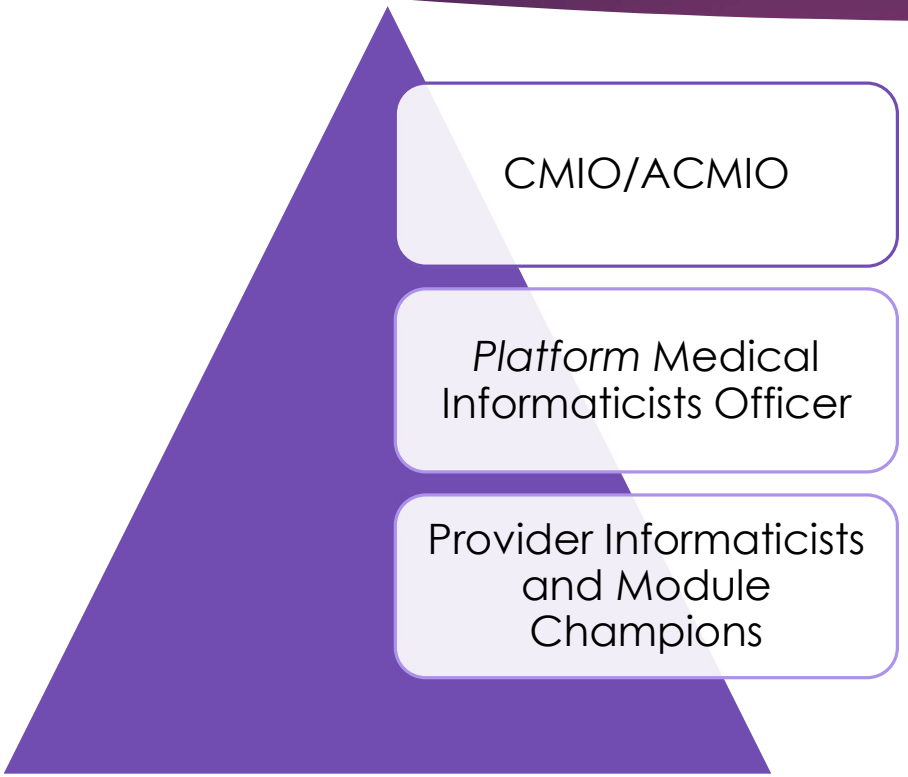
Provider Roles at F&MCW

Provider Informaticists	Module Champions	Medical Informaticist Officer	CMIO and Associate CMIO
• Departmental/Specialty specific • NEO Providers and efficiency support • Project based • Local SME	• EHR application specific • Upgrades and Optimization of Workflows and tools • End user Support	• Platform and Operational Facing (AMB/IP/SURG/PROC) • Facilitate Prioritization with IT and Solutioning for end to end solutions • Support Technology Adoption across the clinical environment	• Programmatic Oversite • Partner with IT and Organizational Leadership • Strategic • Governance

Reporting Structure



Provider CI Role in Decision Making



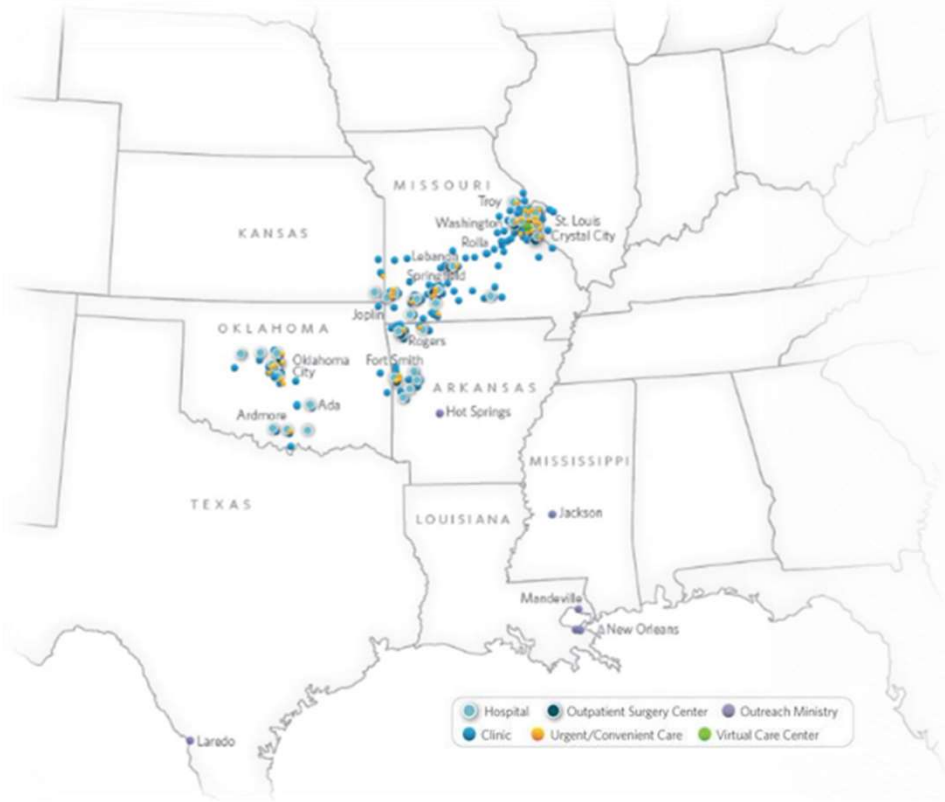
Executive CIGC:
- Program Development
- Institutional Priorities

Sub- Steering Committees:
- Decisional IT+ Op +CI +Quality
- Change Management
- Prioritization and Resource Management

Workgroups:
- Epic Update Reviews
- Workflow Analysis
- Vet Enhancements

About Mercy

Services & Locations



Hospitals & Ambulatory Sites

30 acute care hospitals
5 heart hospitals
5 rehab hospitals
2 children's hospitals
2 orthopedic hospitals
1 virtual care command center
857 physician practices
305 clinic locations
18 outpatient surgery centers
41 urgent care sites
13 convenient care centers

Medical Staff & Co-workers

43,000 co-workers including:
2,300+ integrated physicians
1,800+ integrated advanced practitioners

Utilization FY20

3,199 staffed beds
24,705 births
185,882 surgeries
199,138 inpatient discharges
11,148,338 clinic and outpatient visits
730,075 ED visits

Financial Information FY20

$6.3 billion total operating revenue
$4.2 billion total assets
$340 million community benefit/charity care

Mercy

Clinical Informatics

Gavin Helton, MD
Senior VP
Population Health

Jeff Ciaramita, MD
Senior VP
Chief Physician Executive

John Mohart, MD
President
Mercy Communities

Scott Richert
CIO

Todd Craig, MD
VP Clinical Informatics

Betty Jo Rocchio, DNP
Senior VP
Chief Nursing Officer

Mike Potts, MD
Executive Director
Clinical Informatics
South Central

Damon Broyles, MD
VP Clinical Innovation
Clinical Informatics

Ed Chen, MD
Medical Director
Clinical Informatics
East

Tracy Breece MSN, RN
Executive Director
Nursing Informatics
Nursing

Caleb King, MD (July 2023)
Medical Director
Clinical Informatics
West

Chad Wagoner, MD
Medical Director
Clinical Informatics
North Central

Jason Dausman, MD
Medical Director
Clinical Informatics
East

Jeff Del Vecchio, PA-C
Medical Director
Clinical Informatics
North Central

Lou Anglo, MD
Medical Director
Clinical Informatics
East

Mercy

Provider Roles at Mercy

- Clinical Informaticists (8)
  - Ministry Wide
  - Facilitate Prioritization with IT and Solutioning for end-to-end solutions
  - Providers and efficiency support
  - Clinical Decision Support
  - Partner with IT and Organizational Leadership
  - Support Technology Adoption across the clinical environment
  - Promoting Software Usability/Human-Centered Design
  - Upgrades and Optimization of Workflows and tools
  - Epic Builder

What Makes a Great Clinical Informaticists?

Why are PA's ideal for Clinical Informatics?


Productivity
Strategy
People
Teamwork
Idea
Facts
Plan

Clinical Informatics Resources

HIMSS

AMIA

INFORMATICS PROFESSIONALS. LEADING THE WAY.

KEEP CALM AND GO LIVE

Epic

The Arch Collaborative.

a KLAS initiative

Questions?

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