HL7 INTERNATIONAL

HL7's 31st Annual

Plenary Meeting

*Improving Patient Safety
with Interoperability*

September 11, 2017
Hyatt Regency La Jolla at Aventine
San Diego, CA

HL7's 31st Annual Plenary Meeting

Monday, September 11, 2017
Hyatt Regency La Jolla at Aventine, San Diego, CA

Improving Patient Safety with Interoperability

8:30 – 8:45 a.m.

Welcoming Comments

Speaker:

Charles Jaffe, MD, PhD
CEO, Health Level Seven International

8:45 – 9:30 a.m.

Keynote Session 1: Can Clinical Informatics Improve the Affordability and Quality of Healthcare?

Physicians and hospitals have installed electronic health records and other information technology capabilities. However, health care remains unaffordable for many Americans and quality of care indicators in the United States lag behind many other countries. How can the investment in information technology improve quality and reduce the cost of health care?

Speaker:

Scott Weingarten, MD
Senior Vice President, Chief Clinical Transformation Officer, and Professor of Medicine at Cedars-Sinai Health System; Chairman of the Board, Stanson Health

9:30 – 10:00 a.m.

Keynote Session 2: Advancing Research to Improve Patient Safety through Health IT

The Agency for Healthcare Research and Quality (AHRQ) issued a Special Emphasis Notice to encourage research applications in the area of patient safety and health information technology. Dr. Lomotan will provide highlights of recently-funded and ongoing research. He will also describe a new AHRQ initiative related to clinical decision support, which could also be leveraged to advance patient safety.

Speaker:

Edwin Lomotan, MD
Medical Officer and Chief of Clinical Informatics for the Health IT Division in the Center for Evidence and Practice Improvement, Agency for Healthcare Research and Quality (AHRQ)

10:00 – 10:30 a.m.

Keynote Session 3: 2017 ONC Activities and Future Perspectives

This presentation will cover an update on ONC's current standards and technology activities, a recap of the cooperative relationship between ONC and HL7, and future perspectives on ONC's health IT interoperability efforts.

Speaker:

Steve Posnack
Director of Standards and Technology, Office of the National Coordinator

Speakers and Topics Subject to Change

10:30 – 11:00 a.m.

Break

11:00 – 11:30 a.m.

Keynote Session 4: Interoperability: Linking Social Determinants of Health Across the Continuum

Speaker:

Shafiq Rab, MD, MPH
Senior VP and CIO, Rush University
Medical Center

11:30 – 12:00 p.m.

Keynote Session 5: The Algorithm for Precision Medicine

This talk will be a deep dive into clinical implementation of precision medicine through a detailed personal case study and generalizations thereof.

Speaker:

Matthew Might, PhD
Director, Hugh Kaul Personalized
Medicine Institute, University of
Alabama at Birmingham

12:00 – 12:30 p.m.

Closing Comments

Speaker:

Pat Van Dyke, RN
Chair, HL7 International Board of
Directors

HL7's 31st Annual Plenary

Welcoming Comments

8:30 – 8:45 am

*****

Charles Jaffe, MD, PhD

CEO, HL7 International

HL7 Plenary Meeting Notes:

HL7's 31st Annual Plenary

Keynote Session 1: Can Clinical Informatics Improve the Affordability and Quality of Healthcare?

8:45 – 9:30 am

*****

Scott Weingarten, MD

Senior Vice President, Chief Clinical Transformation Officer, and Professor of Medicine at Cedars-Sinai Health System; Chairman of the Board, Stanson Health

Keynote Speaker 1

Scott Weingarten, MD

Senior Vice President, Chief Clinical Transformation Officer, and Professor of Medicine at Cedars-Sinai Health System; Chairman of the Board, Stanson Health

Scott Weingarten, MD, MPH, is senior vice president and chief clinical transformation officer at Cedars-Sinai. He is a Professor of Medicine at Cedars-Sinai Health System and a Clinical Professor of Medicine at the David Geffen School of Medicine at UCLA.

Board certified in internal medicine and a fellow of the American College of Physicians, Dr. Weingarten has published approximately 100 articles and editorials on healthcare quality improvement, clinical decision support, and related topics, and has authored numerous chapters on improving the quality of patient care in some of the leading internal medicine textbooks. He has given more than 300 presentations on clinical decision support and related topics throughout the United States and internationally.

Dr. Weingarten has held positions on a myriad of national committees dedicated to improving patient outcomes, including those of the Institute for Medical Quality, the American Heart Association's "Get With The Guidelines" program, and the quality improvement committee of the board of directors of St. Joseph's Health System. He is currently a Board of Director for the Scottsdale Institute. At Cedars-Sinai, he has been awarded both the President's Award and the Golden Apple Teaching Award, and was Alumnus of the Year for 2009.

Dr. Weingarten was the co-founder, president and chief executive officer of Zynx Health, which is the leader for order sets and care plans for electronic health records. Scott sold Zynx Health to the Cerner Corporation and later to the Hearst Corporation. Zynx Health is one of the Hearst Corporation's larger companies. He is a co-inventor of three software patents granted by the United States Patent and Trademark Office.

After graduating from UCLA's medical school, Dr. Weingarten completed his internship, residency and fellowship in internal medicine at Cedars-Sinai. He later participated in a National Center for Health Services Research Fellowship at the RAND/UCLA Center for Health Policy Study. During the fellowship, he also earned a master's of Public Health degree at the UCLA Fielding School of Public Health.
Dr. Weingarten has also worked as a primary care physician at Kaiser Permanente and was awarded partnership status at Southern California Permanente Medical Group.

Can Clinical Informatics Improve the Affordability and Quality of Health Care?

Scott Weingarten, M.D
Sr. Vice President and Chief Clinical Transformation Officer
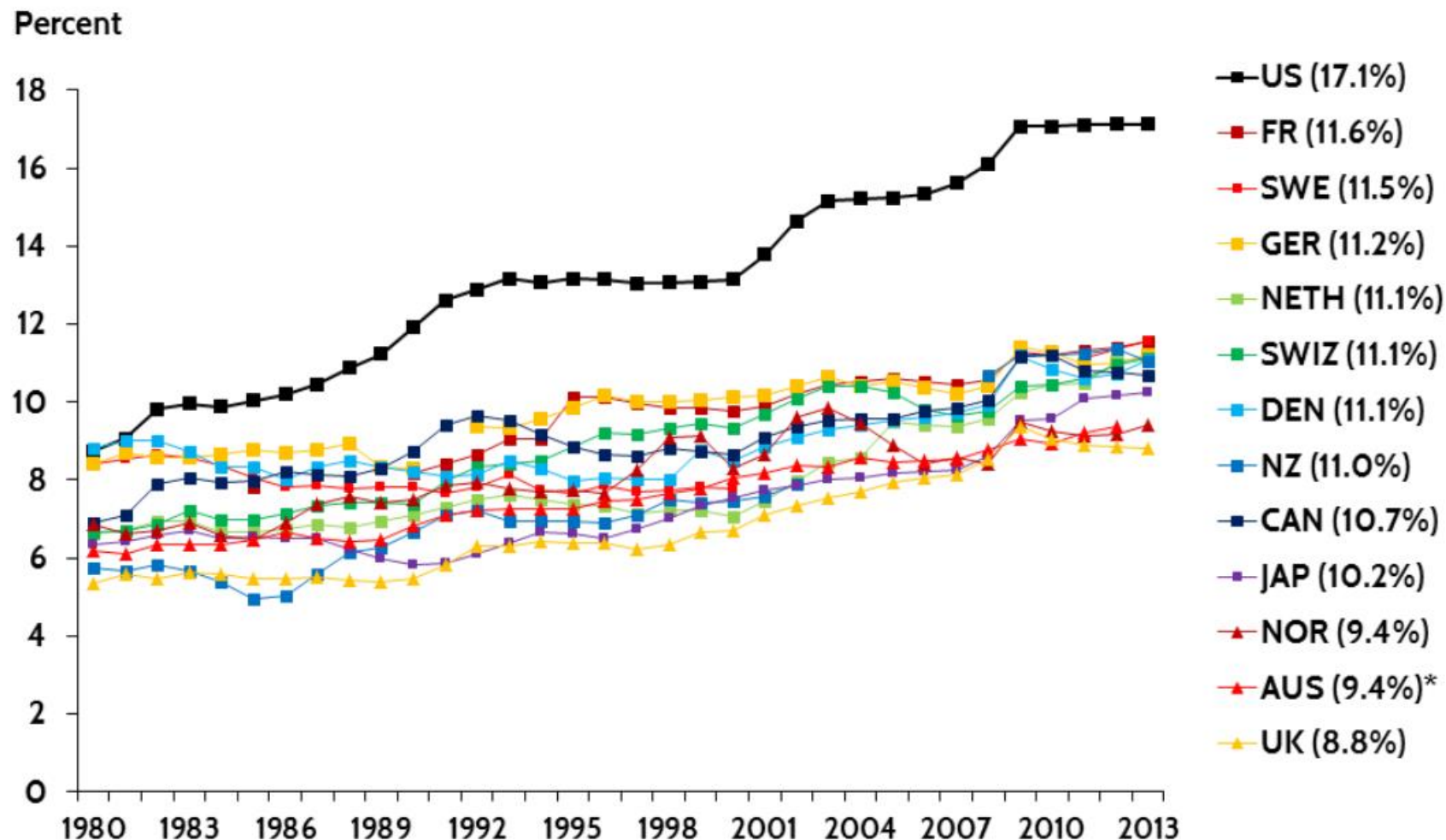**Cedars-Sinai Health System**
Disclosure: Stanson Chairman of Board

CEDARS-SINAI®

LEADING THE QUEST™

Exhibit 1. Health Care Spending as a Percentage of GDP, 1980–2013

Percent

Legend:
- US (17.1%)
- FR (11.6%)
- SWE (11.5%)
- GER (11.2%)
- NETH (11.1%)
- SWIZ (11.1%)
- DEN (11.1%)
- NZ (11.0%)
- CAN (10.7%)
- JAP (10.2%)
- NOR (9.4%)
- AUS (9.4%)*
- UK (8.8%)

* 2012.

Notes: GDP refers to gross domestic product. Dutch and Swiss data are for current spending only, and exclude spending on capital formation of health care providers.

Source: OECD Health Data 2015.

Exhibit 9. Select Population Health Outcomes and Risk Factors

	Life exp. at birth, 2013[a]	Infant mortality, per 1,000 live births, 2013[a]	Percent of pop. age 65+ with two or more chronic conditions, 2014[b]	Obesity rate (BMI>30), 2013[a,c]	Percent of pop. (age 15+) who are daily smokers, 2013[a]	Percent of pop. age 65+
Australia	82.2	3.6	54	28.3[e]	12.8	14.4
Canada	81.5[e]	4.8[e]	56	25.8	14.9	15.2
Denmark	80.4	3.5	–	14.2	17.0	17.8
France	82.3	3.6	43	14.5[d]	24.1[d]	17.7
Germany	80.9	3.3	49	23.6	20.9	21.1
Japan	83.4	2.1	–	3.7	19.3	25.1
Netherlands	81.4	3.8	46	11.8	18.5	16.8
New Zealand	81.4	5.2[e]	37	30.6	15.5	14.2
Norway	81.8	2.4	43	10.0[d]	15.0	15.6
Sweden	82.0	2.7	42	11.7	10.7	19.0
Switzerland	82.9	3.9	44	10.3[d]	20.4[d]	17.3
United Kingdom	81.1	3.8	33	24.9	20.0[d]	17.1
United States	78.8	6.1[e]	68	35.3[c]	13.7	14.1
OECD median	81.2	3.5		23.3	18.9	17.0

[a] Source: OECD Health Data 2015.
[b] Includes: hypertension or high blood pressure, heart disease, diabetes, lung problems, mental health problems, cancer, and joint pain/arthritis. Source: Commonwealth Fund International Health Policy Survey of Older Adults, 2014.
[c] DEN, FR, NETH, NOR, SWE, and SWIZ based on self-reported data; all other countries based on measured data.
[d] 2012.   [e] 2011.

Factoids

- 250,000 fatal medical errors in the US/year
- Patient mortality rates are lower for women physicians
- 80% to 90% of health care costs influenced by physician/provider decisions
- 1/3rd health care spend may be waste
- 10% health care spend over-treatment
- $31 billion federal subsidy for EHRs

Eliminating Waste in US Health Care
Donald M. Berwick, MD, MPP; Andrew D. Hackbarth, MPhil
≫ Author Affiliations
JAMA. 2012;307(14):1513-1516. doi:10.1001/jama.2012.362

CEDARS-SINAI.

LEGISLATION

Doctors hail House vote to repeal, replace SGR

BY ALICIA GALLEGOS in Top News Stories on March 26th, 2015

Physicians are lauding passage of legislation by the House of Representatives to repeal the Medicare Sustainable Growth Rate formula (SGR) and replace it with an alternative system that would raise physician payments and focus on value-based performance. The bill also reauthorizes the Children's Health Insurance Program (CHIP) for 2 years.

By a vote of 329-37, the House on March 26 passed H.R. 2, the Medicare Access and CHIP Reauthorization Act . The legislation builds on H.R. 1470, the SGR

WASHINGTON-WATCH 04.14.2015   7 COMMENTS ▼

Senate Passes Historic SGR Repeal Bill By Vote of 92-8

— Measure now heads to President Obama, who has said he will sign it.
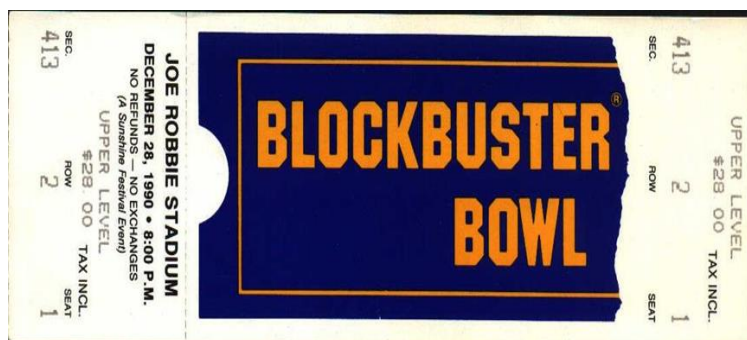
CEDARS-SINAI

Health System Challenges

- Value-based care - reimbursement
  - Medicare
    - Inpatient losses
    - MACRA
    - Medicare Advantage
  - Commercial insurance
    - Risk-based payments
    - ACOs
   - Narrow networks
    - Bundles

CEDARS-SINAI®

SATURDAY, APRIL 19 AT 9 PM

Billy Crystal 700 Sundays
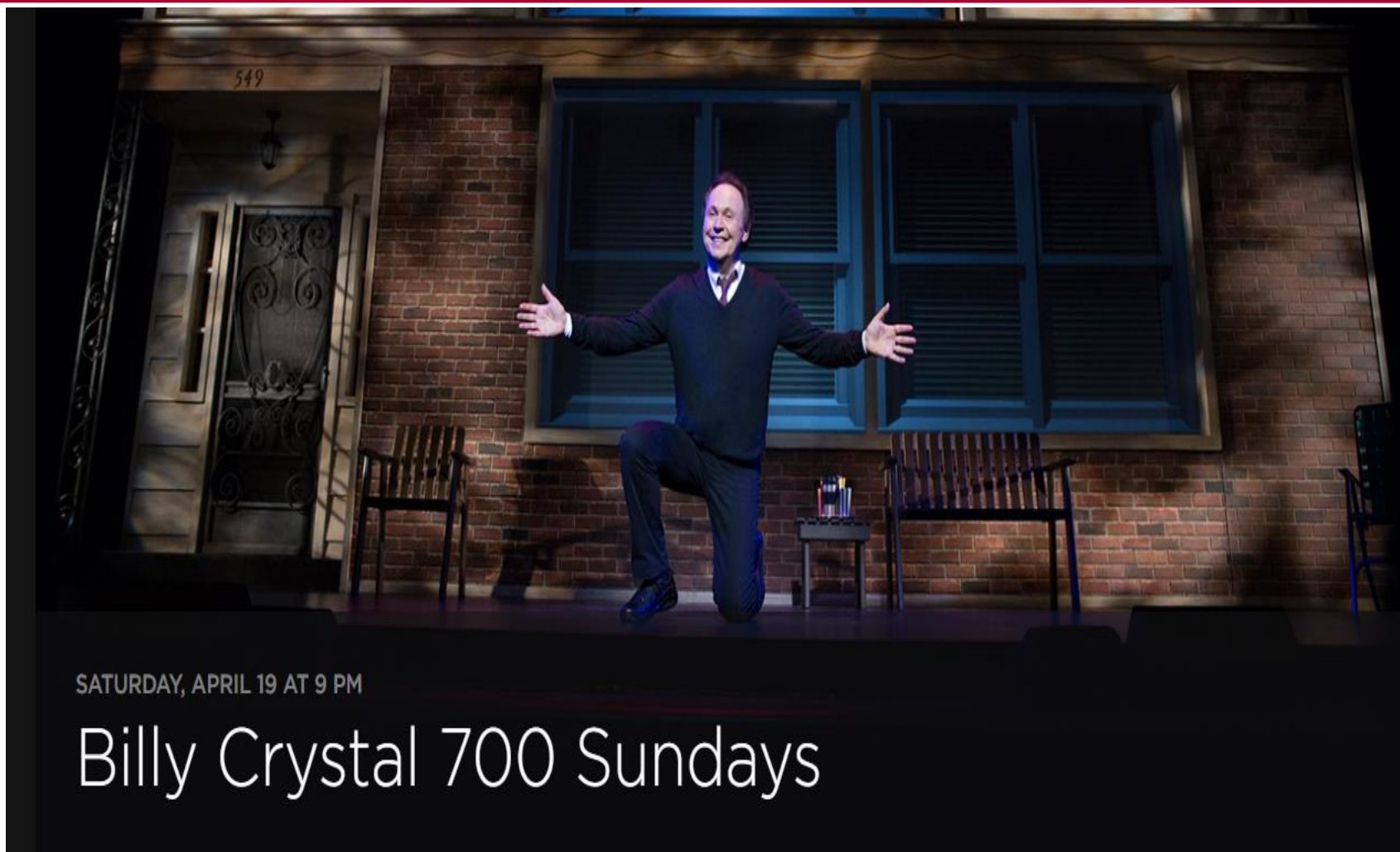
50 Things Your Smartphone Replaced
(Or Will Replace In The Future)

- Camera
- Cam-recorder
- Radio
- Portable Music Player
- eBook Reader
- Calculator
- Voice Recorder
- GPS
- Flash Light
- Leveler
- Scanner
- Compass
- Portable Gaming Device
- Game Console Controller
- Barcode Scanner
- Credit Card Scanner
- USB Thumbdrive
- Portable Video Player
- Walkie Talkie
- Traditional Landline Phone
- Clock/Alarm Clock
- Wrist Watch
- Timer
- Books

- Calendar
- Notepad/Sketchpad
- Newspaper
- Photo Album
- Contact List/Phone Book
- Board Games
- Watching Movies
- Land-line Internet
- Checking eMail
- Surfing Internet
- Video Chatting
- Thermostat
- Measuring Tapes
- Guitar Tuner
- Light Meter
- ATM/Debit/Credit Cards
- Airline Tickets
- Business Cards
- Remote Controller
- Car Keys
- Paper Money/Coins
- Cable TV
- Laptops
- Communication Skills

Decision Support
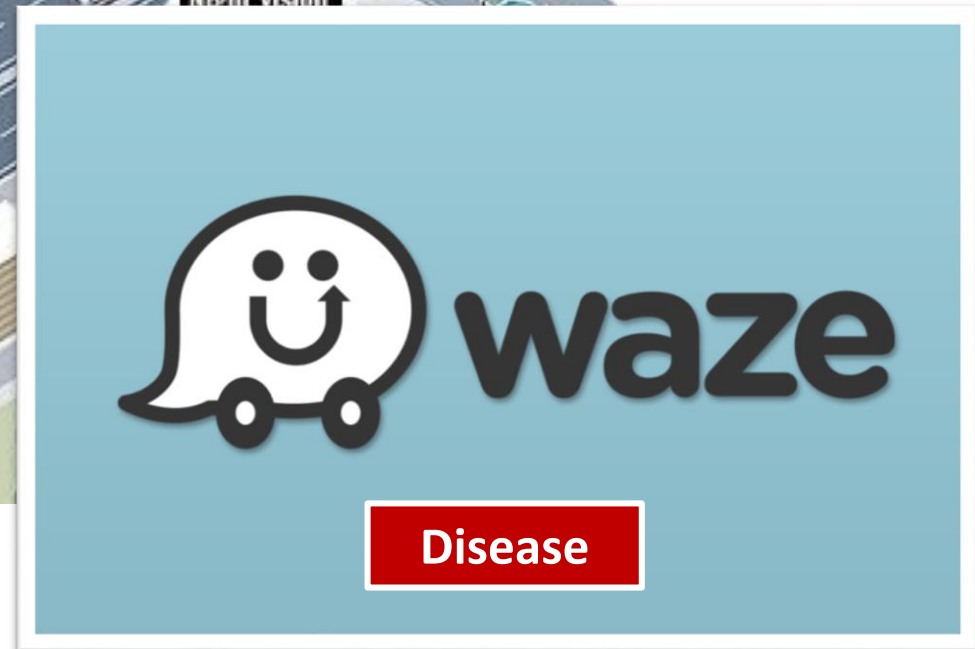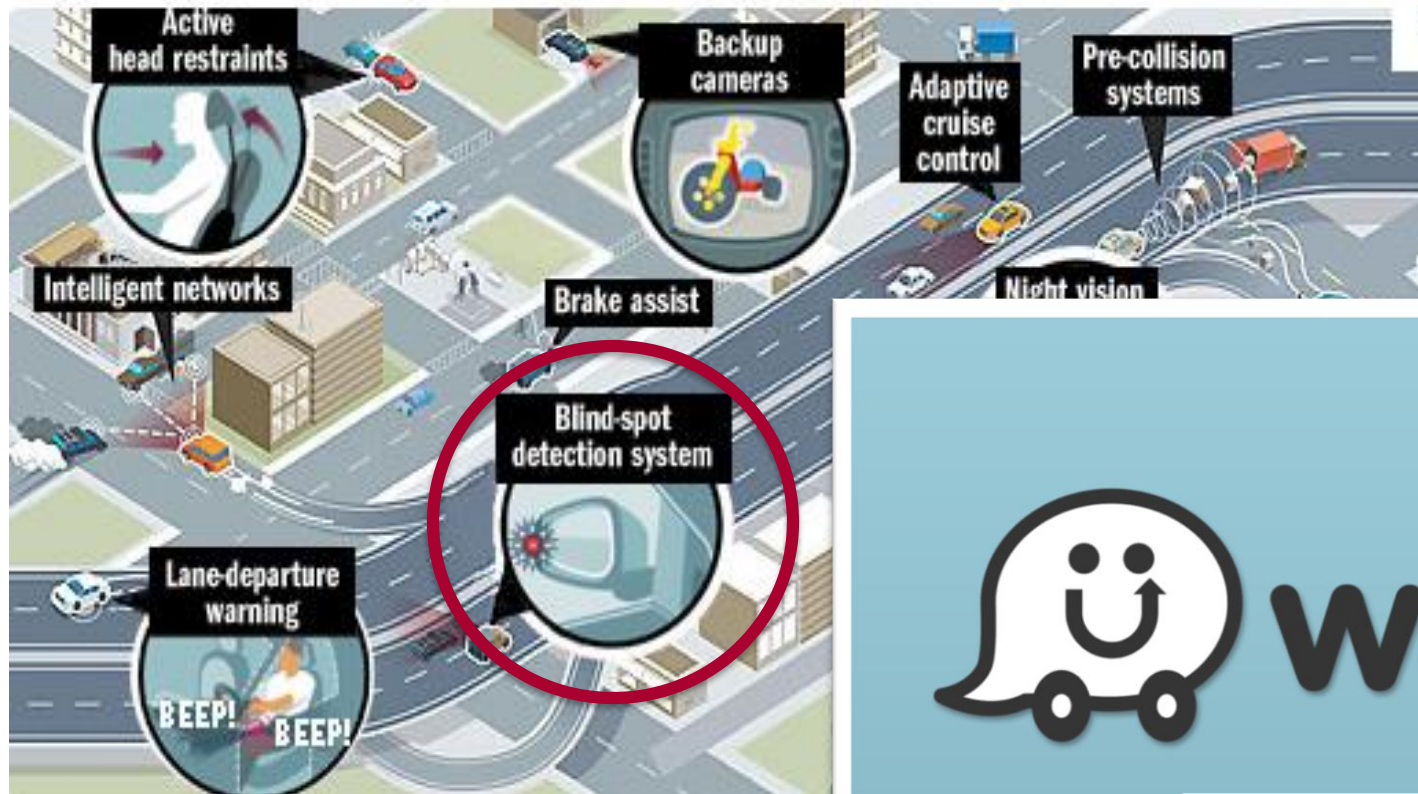
Lowered accident claims

Mercedes 16%

Acura 15%

Decision Support

What works?

Predictors of Success	Adjusted OR
Automatic provision of decision support as part of workflow	**112**
Provision of decision support at the time and location of decision making	15
Provision of recommendation rather than just an assessment	7
Computer-based generation of decision support	6

Source: Kawamoto K, Houlihan CA, Balas EA, Lobach DF. Improving clinical practice using clinical decision support systems: a systematic review of trials to identify features critical to success. BMJ. 2005 Apr 2;330(7494):765. PMID: 15767266

Choosing Wisely
An initiative of the ABIM Foundation

American College of Emergency Physicians

American College of Emergency Physicians
ADVANCING EMERGENCY CARE

Five Things Physicians and Patients Should Question

1. Avoid computed tomography (CT) scans of the head in emergency department patients with minor head injury who are at low risk based on validated decision rules.

Minor head injury is a common reason for visiting an emergency department. The majority of minor head injuries do not lead to injuries such as skull fractures or bleeding in the brain that need to be diagnosed by a CT scan. As CT scans expose patients to ionizing radiation, increasing patients' lifetime risk of cancer, they should only be performed on patients at risk for significant injuries. Physicians can safely identify patients with minor head injury in whom it is safe to not perform an immediate head CT by performing a thorough history and physical examination following evidence-based guidelines. This approach has been proven safe and effective at reducing the use of CT scans in large clinical trials. In children, clinical observation in the emergency department is recommended for some patients with minor head injury prior to deciding whether to perform a CT scan.

2. Avoid placing indwelling urinary catheters in the emergency department for either urine output monitoring in stable patients who can void, or for patient or staff convenience.

Indwelling urinary catheters are placed in patients in the emergency department to assist when patients cannot urinate, to monitor urine output or for patient comfort. Catheter-associated urinary tract infection (CAUTI) is the most common hospital-acquired infection in the U.S., and can be prevented by reducing the use of indwelling urinary catheters. Emergency physicians and nurses should discuss the need for a urinary catheter with a patient and/or their caregivers, as sometimes such catheters can be avoided. Emergency physicians can reduce the use of indwelling urinary catheters by following the Centers for Disease Control and Prevention's evidence-based guidelines for the use of urinary catheters. Indications for a catheter may include: output monitoring for critically ill patients, relief of urinary obstruction, at the time of surgery and end-of-life care. When possible, alternatives to indwelling urinary catheters should be used.

3. Don't delay engaging available palliative and hospice care services in the emergency department for patients likely to benefit.

Palliative care is medical care that provides comfort and relief of symptoms for patients who have chronic and/or incurable diseases. Hospice care is palliative care for those patients in the final few months of life. Emergency physicians should engage patients who present to the emergency department with chronic or terminal illnesses, and their families, in conversations about palliative care and hospice services. Early referral from the emergency department to hospice and palliative care services can benefit select patients resulting in both improved quality and quantity of life.

4. Avoid antibiotics and wound cultures in emergency department patients with uncomplicated skin and soft tissue abscesses after successful incision and drainage and with adequate medical follow-up.

Skin and soft tissue infections are a frequent reason for visiting an emergency department. Some infections, called abscesses, become walled off and form pus under the skin. Opening and draining an abscess is the appropriate treatment; antibiotics offer no benefit. Even in abscesses caused by Methicillin-resistant *Staphylococcus aureus* (MRSA), appropriately selected antibiotics offer no benefit if the abscess has been adequately drained and the patient has a well-functioning immune system. Additionally, culture of the drainage is not needed as the result will not routinely change treatment.

5. Avoid instituting intravenous (IV) fluids before doing a trial of oral rehydration therapy in uncomplicated emergency department cases of mild to moderate dehydration in children.

Many children who come to the emergency department with dehydration require fluid replacement. To avoid the pain and potential complications of an IV catheter, it is preferable to give these fluids by mouth. Giving a medication for nausea may allow patients with nausea and vomiting to accept fluid replenishment orally. This strategy can eliminate the need for an IV. It is best to give these medications early during the ED visit, rather than later, in order to allow time for them to work optimally.

Choosing Wisely
An initiative of the ABIM Foundation

ConsumerReportsHealth

American College of Emergency Physicians
ADVANCING EMERGENCY CARE

ABIM FOUNDATION

Avoid unnecessary treatments in the ER

A discussion with the doctor can help you make the best decision

It can be hard to say "No" in the emergency department. But talking with your emergency room (ER) doctor may help you avoid costly testing.

That's why the American College of Emergency Physicians lists three common procedures you should know about:

- CT scans of the head for minor injury
- Urinary catheters
- Antibiotics and cultures for abscesses

CT scans of the head for minor injury. A CT scan uses X-rays to create a picture of the brain. If your head injury is not serious, a CT scan does not give useful information to the doctor. A medical history and physical exam help the doctor determine if your injury is minor. This can help you avoid a CT scan.

CT scans have risks and cost a lot. CT scans use radiation, which can increase the risk of cancer. Children, especially infants, have greater risks because their brains are still developing.

Services in the ER cost a lot, because of fees for doctors, services, and facilities. A CT scan can add over $2,000 to your costs.

You may need a CT scan if you have dangerous symptoms, such as:

- An injury your doctor can see or feel.
- Becoming unconscious.
- Changes in mental state or alertness.
- Ongoing vomiting or a bad headache.

If you take a blood thinner, such as warfarin (Coumadin®), you are more likely to bleed. So you may need a CT scan, even for a minor injury.

CEDARS-SINAI

Daniel Wolfson

Choosing Wisely®
An initiative of the ABIM Foundation

1 Don't place, or leave in place, urinary catheters for incontinence or convenience or monitoring of output for non-critically ill patients (acceptable indications: critical illness, obstruction, hospice, perioperatively for <2 days for urologic procedures; use weights instead to monitor diuresis).

Increased morbidity, mortality, costs

2 Don't prescribe medications for stress ulcer prophylaxis to medical inpatients unless at high risk for GI complications.
According to published guidelines, medications for stress ulcer prophylaxis

Increased nosocomial pneumonia, C difficile, costs

3 Avoid transfusions of red blood cells for arbitrary hemoglobin or hematocrit thresholds and in the absence of symptoms of active coronary disease, heart failure or stroke.

Increased morbidity, mortality, costs

CEDARS-SINAI®

Cedars-Sinai Alerts Its Docs to *Choosing Wisely*

June 5, 2014

With a focus on stimulating physician and patient conversations, there is perhaps no more appropriate environment in which the *Choosing Wisely*® campaign could take hold than the examining room. Cedars-Sinai Health System has taken an important step in ensuring these conversations happen by becoming the first system in the nation to incorporate dozens of specialty society campaign recommendations into its electronic medical records (EMR) system.

physician starts order in EMR

likely unnecessary

likely appropriate

order *placed*

order *cancelled*

Choosing Wisely: Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation or delirium.
(American Geriatrics Society)[1, 2, 3]

Hyperlink: Choosing Wisely – American Geriatrics Society
Information for Patients: Use of Sedatives in Elderly Patients

Reasons for override:

sleep disorder	end of life care	withdrawal / DT
non-drug options failed	peri-procedural anesthesia	

note: CDS alert displays using Epic's native best practice alerts; Epic does not allow use of actual screenshots

CEDARS-SINAI.

Choosing Wisely

≈ alerts 250 per day
About 2.5% of total alerts

physician starts
order in EMR

likely unnecessary

likely appropriate

order
placed

order
cancelled

Choosing Wisely: Don't transfuse more units of blood than absolutely necessary.
(Society for Hospital Medicine)[1, 2, 3]

Hyperlink: Choosing Wisely – Society of Hospital Medicine
Information for Patients: Blood Transfusion for Anemia in the Hospital

Reasons for override:

| Active blood loss | Hemoglobinopathy | Subarachnoid hemorrhage |
| Chemotherapy | | |

*note: CDS alert displays using Epic's native best practice alerts;
Epic does not allow use of actual screenshots*

targeted alerts integrated into workflow with closed loop analytics

Crimson reports 17% reduction in blood utilization while CMI increased by 14%.
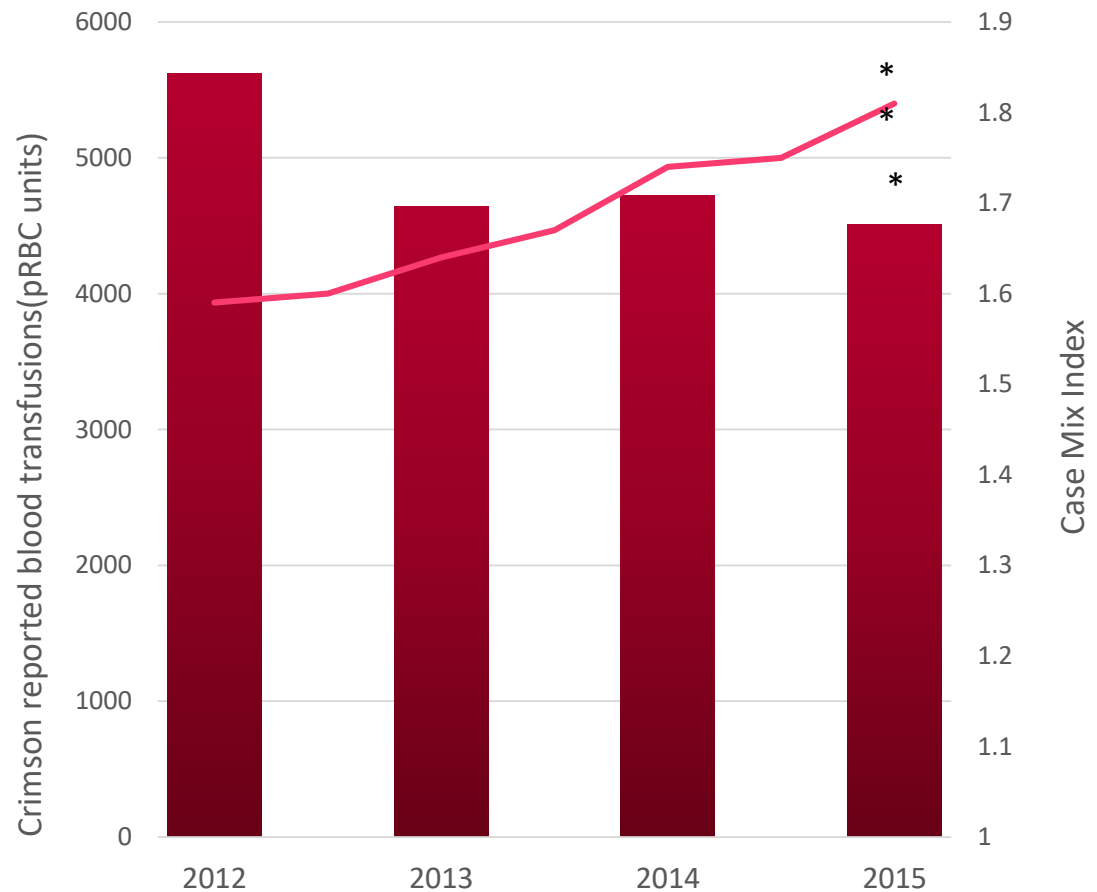
* 2015 is projected from 6 months of data
** 2015 Case Mix Index (CMI) value is from January-June data

Measuring Impact

Cancelled orders

If you trigger the same alert 10 times, do you order and cancel or anticipate the alert?

If you have already explained the test/procedure to the patient, do you cancel or wait and not order the next time?

Does not account for educational impact

Reduced rate of ordering/inappropriate orders avoided

Harder to measure

- *Interrupted time series design*

- *Inappropriate orders avoided design*

- *Adjusted ordering rates*

CEDARS-SINAI®

Followed Rates Vs. Educational Impact

- Work flow and backtracking
  - Blood tests
  - MRI
  - Colonoscopy
  - PAP smears

What About Patients?

What About Patients?

Advice from Consumer Reports

Tips for better sleep

- **Exercise.** Physical activity helps people sleep better. But avoid vigorous activity for several hours before bedtime.
- **Keep a routine.** Try to go to bed and wake up at about the same time every day, even on weekends.
- **Try not to eat right before bedtime.** Eat three hours or more before going to bed.
- **Avoid caffeine after 3 p.m.** Some people need to avoid caffeine even earlier.
- **Limit alcohol.** Alcohol causes sleepiness at first, followed by wakefulness.
- **Create the right environment.** Keep the bedroom peaceful. And avoid mental excitement before bedtime.

Case Study

- PVCs prevalent – 40% to 70% of population
- Transient atrial fibrillation, SVT
- Old studies - Non-selective antiarrhythmic treatment can increase mortality
  - SPAF – Atrial fibrillation
  - CAST - PVCs

4 **Don't order continuous telemetry monitoring outside of the ICU without using a protocol that governs continuation.**

Telemetric monitoring is of limited utility or measurable benefit in low risk cardiac chest pain patients with normal electrocardiogram. Published guidelines provide clear indications for the use of telemetric monitoring in patients which are contingent upon frequency, severity, duration and conditions under which the symptoms occur. Inappropriate use of telemetric monitoring is likely to increase cost of care and produce false positives potentially resulting in errors in patient management.

Nurse Staffing Ratio

- Cardiac monitoring 1:4
- Regular 1:5

- What changes physicians behavior?
- RCT
- Peer comparison feedback
- Accountable justification

Physician Choosing Wisely performance

- Average 0.74% ignored Choosing Wisely alerts/1,000 orders
- Range   0% to 8.77% ignored/1,000 orders

Example:0.53%

Choosing Wisely Performance Rate

Reported Cases of Lyme Disease -- United States, 2013

1 dot placed randomly within county of residence for each confirmed case

last 7 days | last 30 days | **03.01.2014**

Physician - Reproductive Endocrinology

0.516	16	529	0.03	2.86th ⓘ	20th ⓘ
alerts / day	total alerts	total orders	alerts / order	percentile (all)	percentile (Reproductive Endocrinology only)

alert summary

alert	triggered ⓘ	% of total ⓘ
LYME DISEASE (amb) *Don't test for Lyme disease as a cause of musculoskeletal symptoms without an exposure history and appropriate exam findings.*	6	18% *6 out of 34*

☰ view trigger orders

inappropriate ordering of Lyme disease tests

Case Study
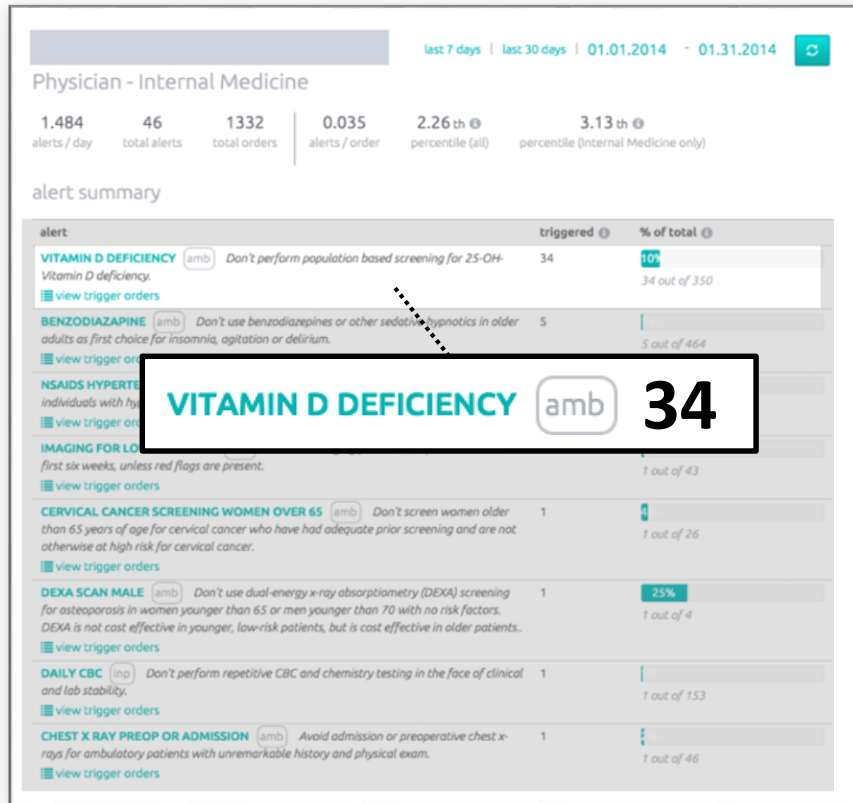
inappropriate vitamin-d screenings - **before**

January 2014
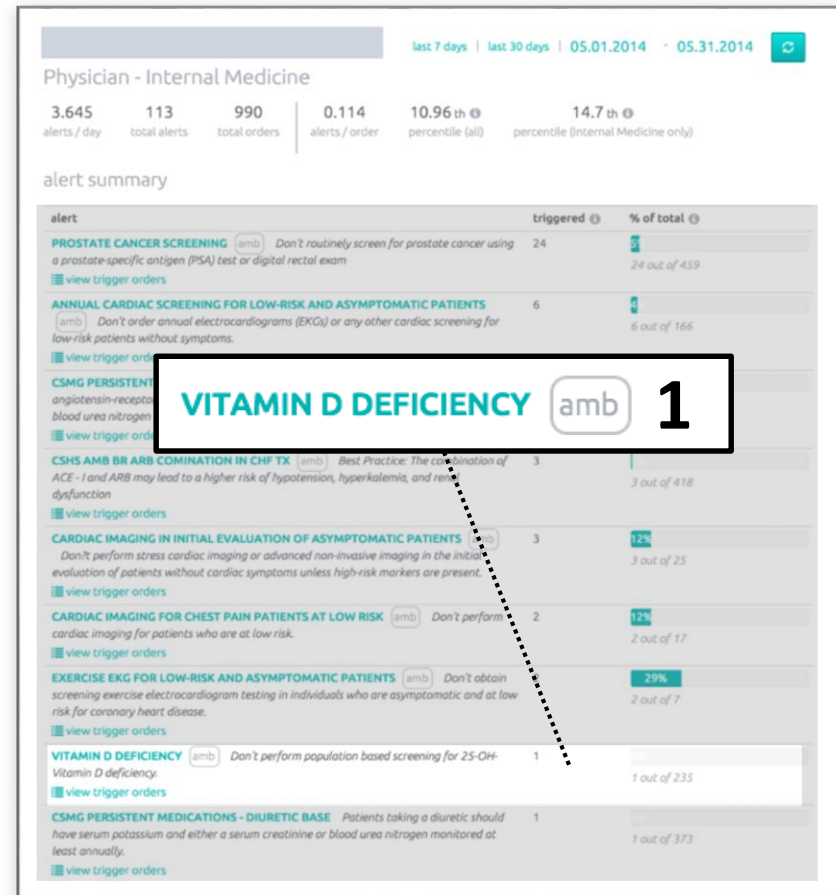
inappropriate vitamin-d screenings - **after**

May 2014

Direction

- Attention to workflow
- Suggestions/nudges during documentation

Evolution of CDS: Towards Precision Medicine

	Today	**Tomorrow**
data	uses **structured EMR** data	uses structured + **unstructured** data (via NLP/ML) from **various sources**
guidance	uses **rules-based** approach	uses rules-based + **AI-based** (ML) approach
delivery	**episodic**: delivered in response to specific provider actions	episodic + **surveillance:** delivered whenever and wherever clinical circumstances change

Mission

- Patient care
- Teaching
- Research

•More residents/fellows joining physician organizations

Independent U.S. Physicians: A Swiftly Shrinking Segment
Only 1 in 3 doctors will be independent by end of 2016, Accenture finds
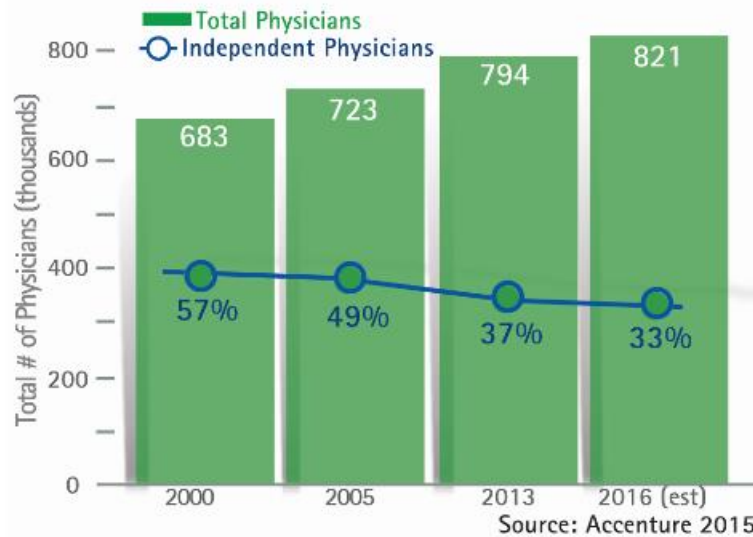
Competency in value-based care

Vascular Surgeon Response

- Physician did not agree with a guideline
- Contacted subspecialty society
- Guideline changed

Society for Vascular Surgery

View all recommendations from this society

Released January 29, 2015; updated July 1, 2016

Avoid use of ultrasound for routine surveillance of carotid arteries in the asymptomatic healthy population.

The presence of a bruit alone does not warrant serial duplex ultrasounds in low-risk, asymptomatic patients, unless significant stenosis is found on the initial duplex ultrasound.

The presence of asymptomatic severe carotid artery disease in the general population yields a risk of neurologic events which is <2%. Even in patients who have a bruit, if no other risk factors exist, the incidence is only 2%. Age (over 65), coronary artery disease, need for coronary bypass, symptomatic lower extremity arterial occlusive disease, history of tobacco use and high cholesterol would be appropriate risk factors to prompt ultrasound in patients with a bruit. Otherwise, these ultrasounds may prompt unnecessary and more expensive and invasive tests, or even unnecessary surgery. In general population-based studies, the prevalence of severe carotid stenosis is not high enough to make bruit alone an indication for carotid screening. With these facts in mind, screening should be pursued only if a bruit is associated with other risk factors for stenosis and stroke, or if the primary care physician determines you are at increased risk for carotid artery occlusive disease.

"Complex but empirically validated algorithms will be embedded in EHR systems as decision support tools to assist in everyday patient care. Those management algorithms will evolve and be modified continuously in accordance with inputs from ongoing clinical observations and from new research. Clinical decision support algorithms will be derived entirely from data, not expert opinion, market incentives, or committee consensus."

New England Journal of Medicine December 27, 2012

Why???

"Of course it's hard. It's supposed to be hard. If it were easy, everybody would do it. Hard is what makes it great."

HL7 Plenary Meeting Notes:

HL7's 31st Annual Plenary

Keynote Session 2: Advancing Research to Improve Patient Safety through Health IT

9:30 – 10:00 am

*****

Edwin Lomotan, MD

Medical Officer and Chief of Clinical Informatics for the Health IT
Division in the Center for Evidence and Practice Improvement,
Agency for Healthcare Research and Quality (AHRQ)

Keynote Speaker 2

Edwin Lomotan, MD
Medical Officer and Chief of Clinical Informatics for the Health IT Division in the Center for Evidence and Practice Improvement, Agency for Healthcare Research and Quality (AHRQ)

Edwin Lomotan, MD, FAAP is a Medical Officer and Chief of Clinical Informatics for the Health IT Division in AHRQ's Center for Evidence and Practice Improvement. His areas of focus include clinical decision support, child health informatics, and patient safety. He currently leads AHRQ's clinical decision support (CDS) initiative, which aims to advance evidence into practice through CDS and to make CDS more shareable, standards-based, and publicly-available.

Before joining AHRQ, Dr. Lomotan was Health IT Branch Chief in the Office of Quality and Data in the Bureau of Primary Health Care at the Health Resources and Services Administration (HRSA). While at HRSA, he led the Health Center-Controlled Network grant program, which aimed to improve health care quality through health IT at community health centers across the country. Dr. Lomotan is board-certified in pediatrics and clinical informatics. He received his medical degree from the University of Pittsburgh. He completed his pediatrics residency and informatics fellowship at Yale University. He also spent several years in community pediatric practice in Connecticut before joining federal service in 2010.

Advancing Research to Improve Patient Safety through Health IT
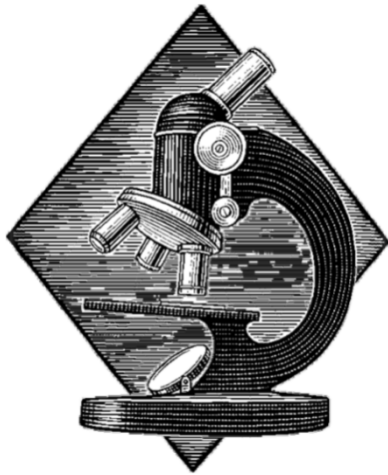
Edwin Lomotan, MD

HL7 Annual Plenary Meeting

September 11, 2017

Agenda

- Agency background
- Patient safety highlights from AHRQ's health IT research portfolio
- AHRQ's clinical decision support initiative
- Questions and suggestions

HHS Organizational Focus

NIH

Biomedical research to prevent, diagnose, and treat disease

CDC

Population health and the role of community-based interventions to improve health

AHRQ

Long-term and system-wide improvement of health care quality and effectiveness

AHRQ Mission

To produce evidence to make health care safer, higher quality, more accessible, equitable, and affordable, and to work within HHS and with other partners to make sure that the evidence is understood and used

AHRQ Health IT Mission

To produce evidence about how health IT can make health care safer, higher quality, more accessible, equitable, and affordable, and to work within HHS and with other partners to make sure that the evidence is understood and used

Health IT Research

- Current health IT research portfolio
  - Approximately 125 active grants
  - Approximately $126 million across all grants and project periods
  - Range of mechanisms and sizes
- Wide spectrum of topics
  - Clinical decision support
  - Mobile health and telehealth
  - Health IT design and implementation
  - Health IT safety

Special Emphasis Notice for Research on Health IT Safety

- NOT-HS-16-009 published March 2016
  - https://grants.nih.gov/grants/guide/notice-files/NOT-HS-16-009.html
- Encourages research applications on safe health IT practices, specifically
  - design, implementation, usability, and safe use of health IT
  - all users, including patients
- Applies to range of funding mechanisms and opportunities

Measures of Health IT Safety

- Wrong Patient Retract-And-Reorder Measure (NQF #2723)
  - Jason Adelman, MD (Columbia University, New York-Presbyterian Hospital)
  - Guiding policy on multiple records open in EHRs
  - Identifying wrong dose, wrong medication, wrong route, wrong frequency errors
  - Providing evidence for patient photographs in EHRs to reduce wrong patient errors

See https://healthit.ahrq.gov/ahrq-funded-projects/assess-risk-wrong-patient-errors-emr-allows-multiple-records-open#h=adelman

8

Safe Performance of Health IT

- Updating Leapfrog's EHR "flight simulator"
  - David Bates, MD (Partners Healthcare, Brigham and Women's Hospital)
  - Further developing the Computerized Physician Order Entry (CPOE) Assessment Tool currently administered via the Leapfrog Hospital Survey
  - Measuring national progress on test performance
  - Updating the test's platform, formularies, and evidence-base
  - Adding new modules

See https://healthit.ahrq.gov/ahrq-funded-projects/ensuring-safe-performance-electronic-health-records#h=bates ensuring safe performance

Design/Usability of Health IT

- Automating detection of patient safety hazards related to health IT in reported events
  - Raj Ratwani, PhD (Medstar)
  - Using natural language processing and machine learning to identify health IT-related patient safety events
  - Categorizing health IT-patient safety events as design or implementation related
  - Developing and disseminating a user-centered design guide with implementation guidance

See https://healthit.ahrq.gov/ahrq-funded-projects/developing-evidence-based-user-centered-design-and-implementation-guidelines#h=ratwani developing

Encouraging Use of Standards in Research Applications

- Example: Clinical Quality Language (CQL) for use in clinical decision support

  - [Developing New Clinical Decision Support to Disseminate and Implement Evidence-Based Research Findings (R18)](#) (PA-17-261)

  - [Scaling Established Clinical Decision Support to Facilitate the Dissemination and Implementation of Evidence-Based Research Findings (R18)](#) (PA-17-260)

See https://www.ahrq.gov/funding/fund-opps/index.html

Clinical Decision Support Initiative (http://cds.ahrq.gov)

Accelerating evidence into practice through CDS and moving CDS closer to becoming more shareable, health IT standards-based, and publicly-available

Four main components:

1. Engaging a stakeholder community

   Patient-Centered Clinical Decision Support Learning Network

2. Creating prototype infrastructure for sharing CDS and developing CDS

   CDS Connect

3. Advancing CDS through demonstration and dissemination research

   Agency for Healthcare Research and Quality
   Advancing Excellence in Health Care

4. Evaluating the overall initiative

Concept of Operations
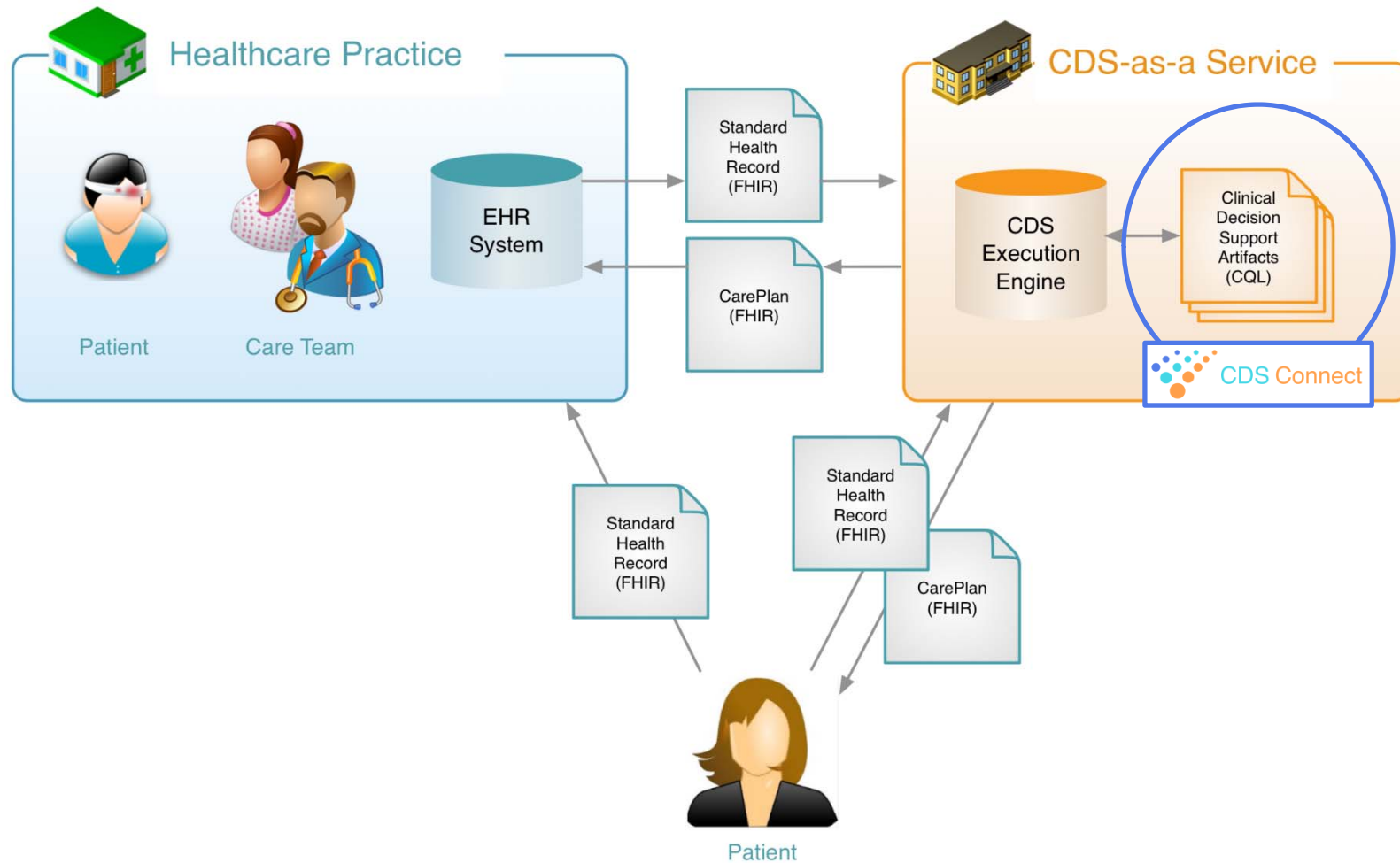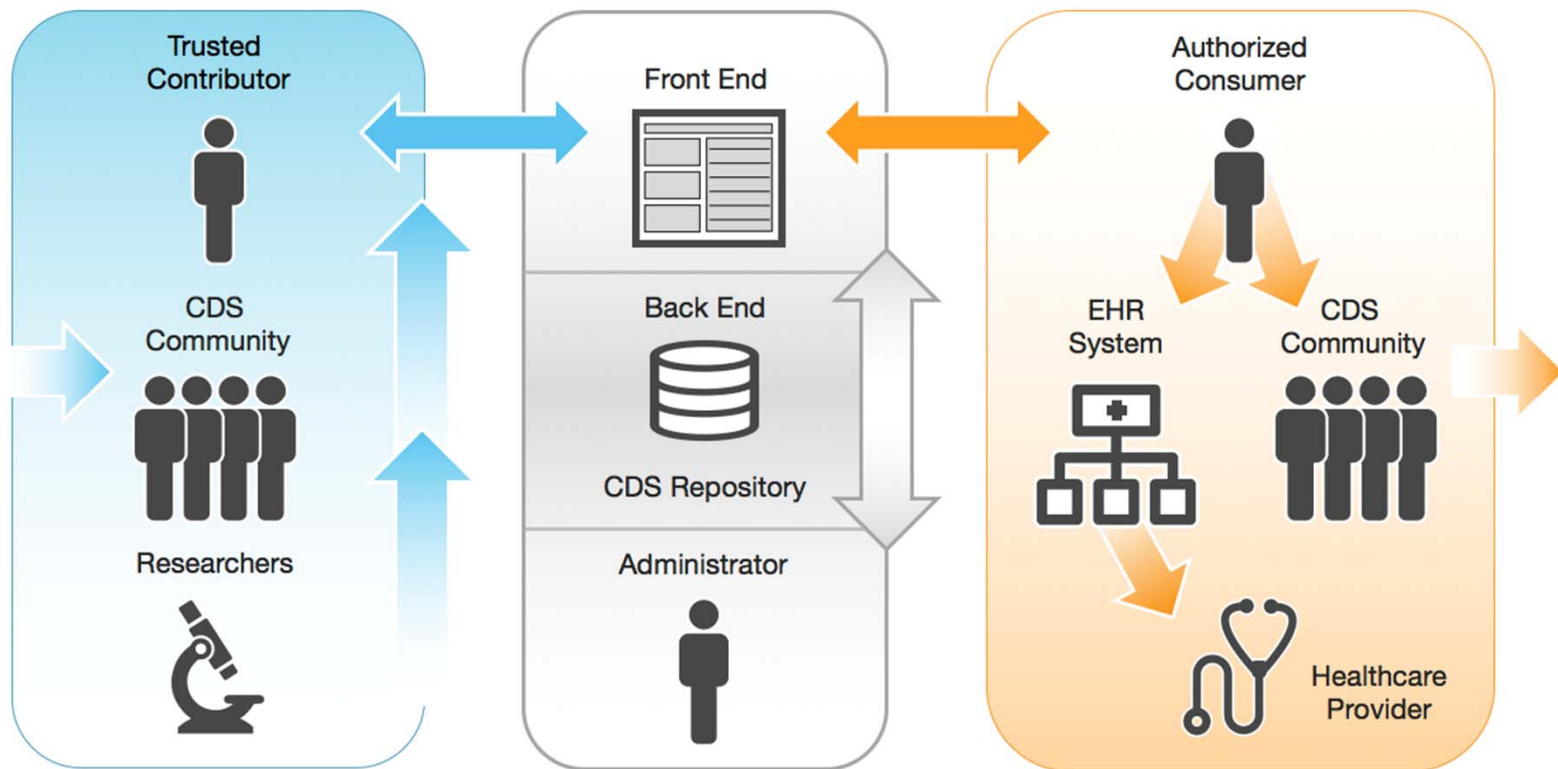
Concept of Operation (CONOP)

- "Realizing the Potential of Patient-Centered Clinical Decision Support"

- October 3, 2017 in Crystal City, VA (just outside DC)

- https://pccds-ln.org/

2017 Annual PCCDS Conference
Crystal City, VA October 3, 2017
Realizing the Potential of Patient
Centered Clinical Decision Support

Patient-Centered
Clinical Decision Support
Learning Network

Questions and Suggestions

- Incorporating standards into our funded research
- Leveraging CDS Connect to build and disseminate patient safety-related clinical decision support
  - CDS authoring tool
- Contact info:
  - ClinicalDecisionSupport@ahrq.hhs.gov
  - Edwin.Lomotan@ahrq.hhs.gov

HL7 Plenary Meeting Notes:

HL7's 31st Annual Plenary

Keynote Session 3: 2017 ONC Activities and Future Perspectives

10:00 – 10:30 am

*****

Steve Posnack

Director of Standards and Technology, Office of the
National Coordinator

Keynote Speaker 3

Steve Posnack

Director of Standards and Technology, Office of the National Coordinator

Steven Posnack serves as Director of the Office of Standards and Technology. In this role, Mr. Posnack advises the National Coordinator, leads the ONC Health IT Certification Program, and directs ONC's standards and technology investments through the ONC Tech Lab, which organizes its work into four focus areas: pilots, standards coordination, testing and utilities, and innovation. He led the creation of the Interoperability Standards Advisory, the redesign of ONC's Certified Health IT Product List (CHPL), created the Interoperability Proving Ground, and developed the C-CDA Scorecard.

Prior to serving as the director of the Office of Standards and Technology, Mr. Posnack led ONC's federal policy division within the Office of Policy and Planning from 2010 to 2014. In this capacity, he led ONC's regulatory affairs, legislative analysis, and several federal policy development and coordination activities. From 2005 to 2010, he served as a Senior Policy Analyst within ONC's Office of Policy and Research. In that position, he co-authored the Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information. He also led a cross-HHS policy team that worked with the Drug Enforcement Agency (DEA) as it developed its regulation for the electronic prescribing of controlled substances (EPCS).

Mr. Posnack earned a bachelor's degree in computer science from Worcester Polytechnic Institute, a master's degree in security informatics from Johns Hopkins University Information Security Institute, and a master's degree in health policy from Johns Hopkins University Bloomberg School of Public Health. He also maintains a Certified Information Systems Security Professional (CISSP) certificate.

Slides not available in advance for Steve Posnack's presentation.

HL7 Plenary Meeting Notes:

HL7's 31st Annual Plenary

Keynote Session 4: Interoperability: Linking Social Determinants of Health Across the Continuum

11:00 – 11:30 am

*****

Shafiq Rab, MD, MPH
Senior VP and CIO, Rush University Medical Center

Keynote Speaker 4

Shafiq Rab, MD, MPH
Senior VP and CIO, Rush University Medical Center

Dr. Rab joined Rush University Medical Center in December 2016 from Hackensack Meridian Health Center as Senior Vice President and Chief Information Officer and is currently spearheading digital care transformation. Previously, he was at Greater Hudson Valley Health System in Middletown, New York, as their Vice President and Chief Information Officer since 2008. In his role at Hackensack Meridian Health, Dr. Rab spearheaded the IT and clinical engineering strategies in alignment with the network's strategic priorities in the development of a clinically integrated health network comprised of ambulatory practices, the Hackensack Alliance ACO, the AllSpire Health Partners Alliance, hospital acquisitions and mergers, as well as academic expansion and research.

Dr. Rab is a nationally recognized inspirational and visionary health information technology executive who has been named the Innovator of the year by the College of Healthcare Information Management Executives (CHIME). He is a clinically and technologically trained executive with over 16 years of successful CIO experience leading the transformation of healthcare systems in becoming integrated care technology organizations in partnership with the organizations' affiliates, new mergers and acquisitions.

As a technology evangelist, he specializes in consensus building between and amongst staff, physicians and stakeholders within complex and disparate environments by instilling trust and confidence. His specialized skillsets in leadership, governance, customer service and development of high performing teams, results in creating organizational capacity to scale IT innovation and health care delivery.

Dr. Rab is an unconventionally technically savvy consecutive "Becker's Top 100 Hospital CIO's to Know" with a unique blend of deep technical knowledge as well as excellent information technology and healthcare leadership skills. He is among the few CIOs that have successfully led two different hospital systems to attest and receive federal funding for meaningful use stage 1 as well as to achieve stage 6 of the HIMSS EMR Adoption Model. Dr. Rab is on the forefront of healthcare cloud technologies and mobile health. He led HackensackUMC into the services model for platform, data center and mobile healthcare software with the implementation of HackensackUMC's private cloud delivering EHR as a service with a full complement of mHealth applications.

Dr. Rab is an authentically compassionate and respectful relationship builder and an extraordinary motivational team builder with a passionate propensity for coaching and mentoring as is evident in the successful development of several technology and healthcare leaders. His high-energy visionary personality is bent on business as well as technical and clinical alignment in fast-paced and agile environments with remarkable persistence and increased intensity in the face of adversity.

Dr. Rab is a founding member and the current president of the New Jersey chapter of HIMSS. He is also an ONC Health IT Fellow as well as an active board member of the Jersey Health Connect HIE, a Certified Healthcare Chief Information Officer (CHCIO), a member of the CHIME board of trustees and a CHIME fellow, the American Health Information Management Association, and the New Jersey Public Health Association.

Follow Dr. Shafiq Rab on Twitter at @CIOSHAFIQ.

About Rush University Health System

- An academic health system whose mission is to improve the health of the patients and the diverse communities it serves with nationally recognized health care, education and research, as well as a commitment to community partnerships.

- The Rush system comprises Rush University Medical Center, Rush University, Rush Copley Medical Center and Rush Oak Park Hospital, as well as numerous outpatient care facilities. Rush University, with more than 2,500 students, is a health sciences university that comprises Rush Medical College, the College of Nursing, the College of Health Sciences and the Graduate College.

The Care Continuum

RUSH

Taking Care of Citizens not Subscribers

All of Chicagoland are our customers

Connectivity

- Connecting patients to the health system
- Mobility empowering patients who previously had no options
- Internet of Everything feeding sensor data in real time

Interoperability

- Bluetooth convenience
- Any system, any time
- Enables collaboration among care team, patient, family and social circles
- Breaks down barriers to efficiently getting the right information at the right time in the right format

The Sanctity of One Human Life is Worth Millions

Through connectivity and interoperability
Rush is connecting the entire continuum
with social services resources to the
underserved and homeless

Real Results of Participants – First 30 Days

- 70 Individuals
- None returned for emergency care
- No CVA
- Identified shortfall of 48 community resources
- 60% prescribed shelters visited
- 400+ meals served
- 70% prescribed counseling visited
- 75% sought economic help for utilities
- 90% took advantage of transportation resources (Rush has a direct relation ship with Lyft)

Value in Stroke & Hemorrhage Prevention Alone

- YTD average length of stay is 10.2 days, The average cost per admission was $34,445 ($21,780 Direct Cost) and per day was $3,365 ($2,127 Direct Cost).

- 23% of cases either expired or entered hospice; 32% were discharged to rehabilitation, incurring additional downstream costs.

- Prevention of cases through blood pressure control could substantially reduce health system costs and patient morbidity

- If applied to 70 individuals we reached with NowPow there is $2.4M in potential financial savings

The HackensackUMC App

Pre-Visit

Consultation & Schedule Visit

Arrive via Wayfinding

Or Be Driven

UBER
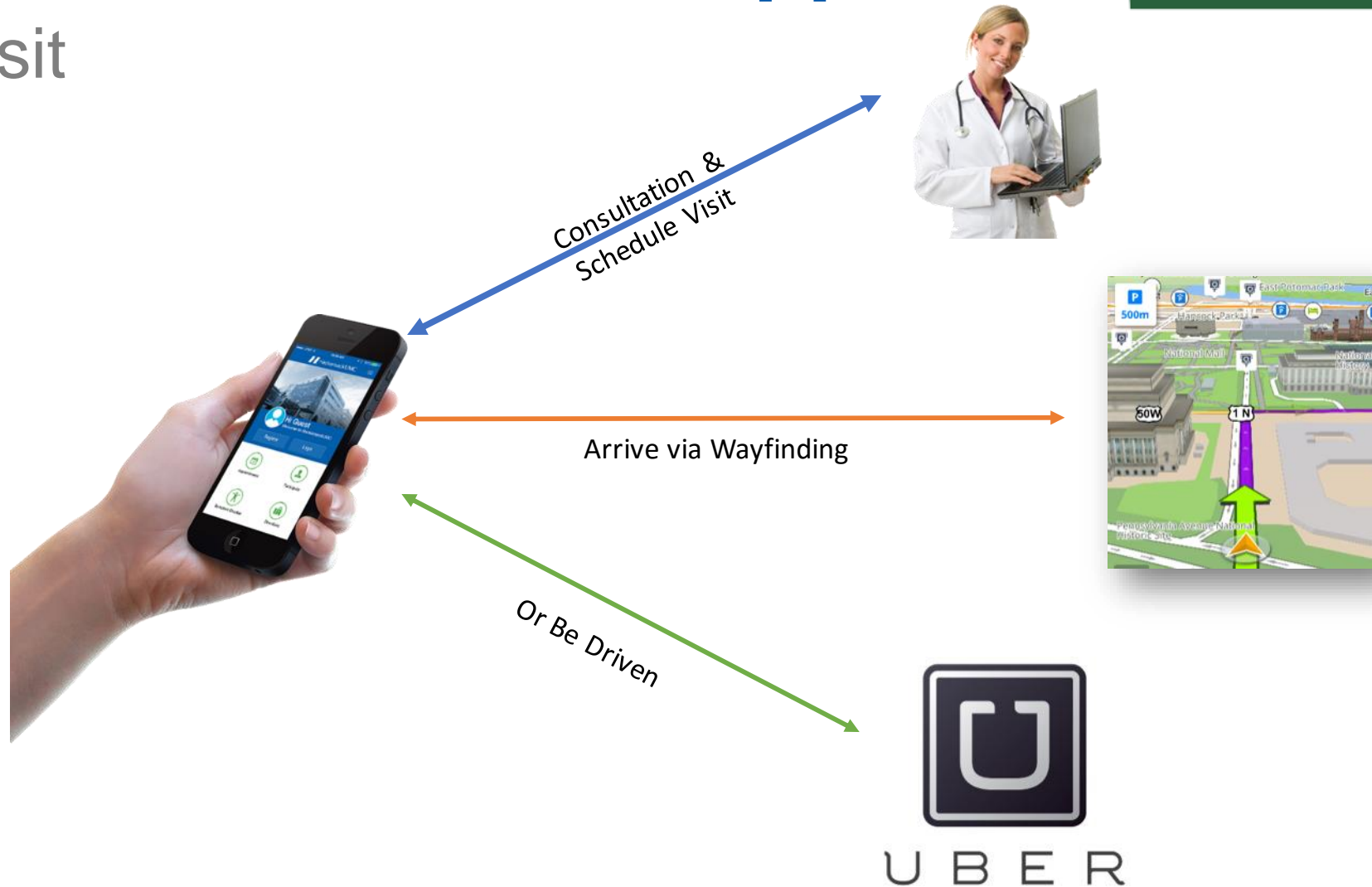
From Open-Notes

To OUR Notes

The HackensackUMC App

Post-Visit
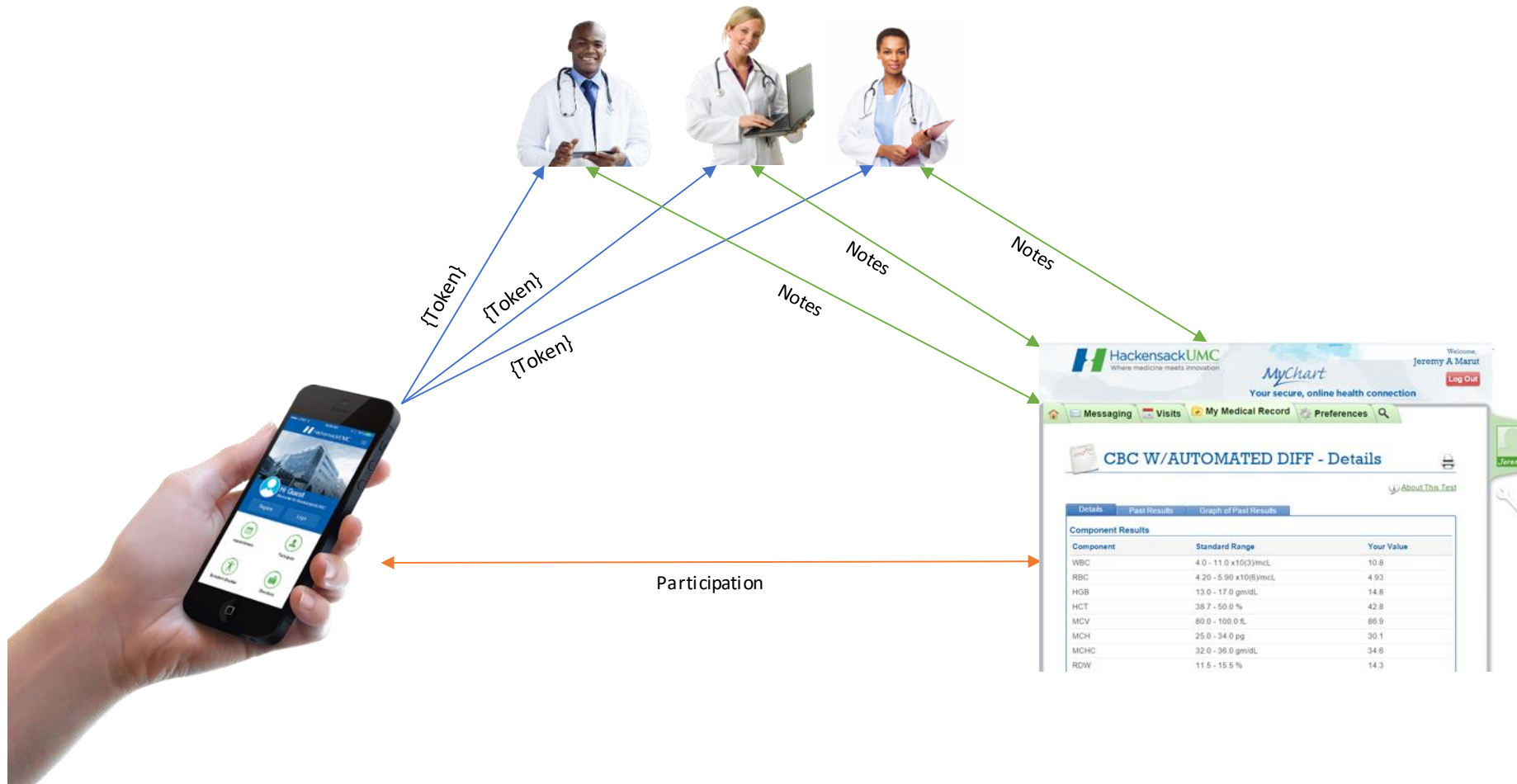
Social Determinants of Health Screening Tool at Rush

- All patients at Rush are assessed right from the Electronic Health Record (EHR) via a new standard Social Determinants of Health screening tool developed jointly by a consortium of Chicagoland health systems

- Rush is the first hospital in the region to integrate it electronically into the EHR and use this data to essentially order community resources and social services for the patient
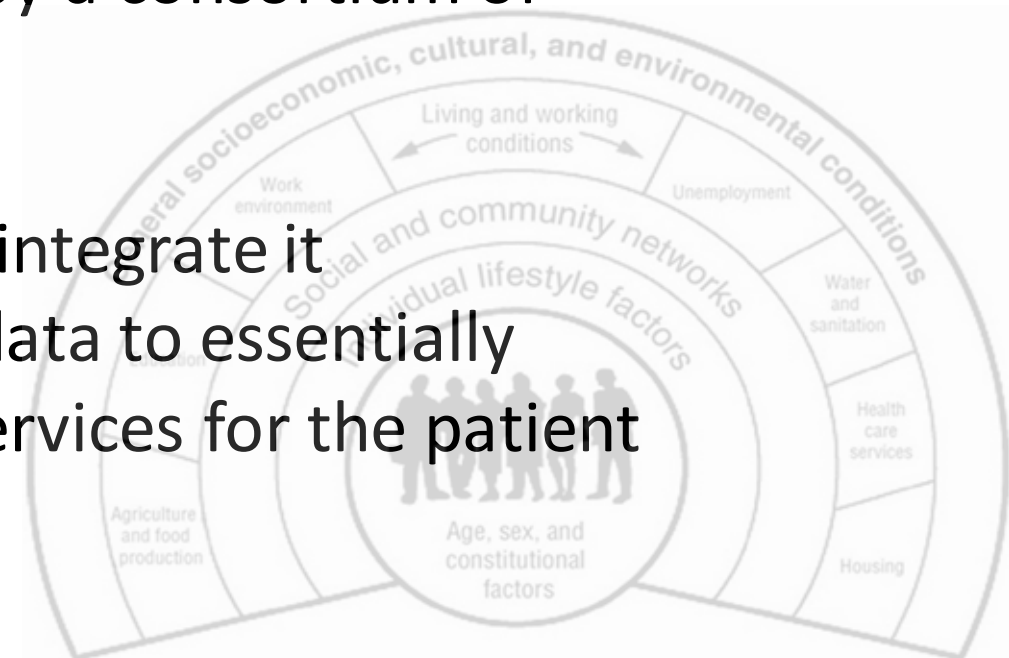
- A tool for providing social referrals to a range of community resources such as food banks, transportation assistance and housing support

- Empowering social workers and providers via a tight integration with Rush's Electronic Health Record, Epic, to refer patients to premier community organizations

- Screener information is exchanged with NowPow via **Smart on FHIR** interoperability standards in context of the patient and provider

Referral Algorithm

- NowPow algorithm uses the SDOH screening data to suggest a range of social services to the clinician seamlessly within the EHR workflow

- Clinician creates referrals to these services which are documented discreetly in the EHR and sent to the patient electronically upon discharge
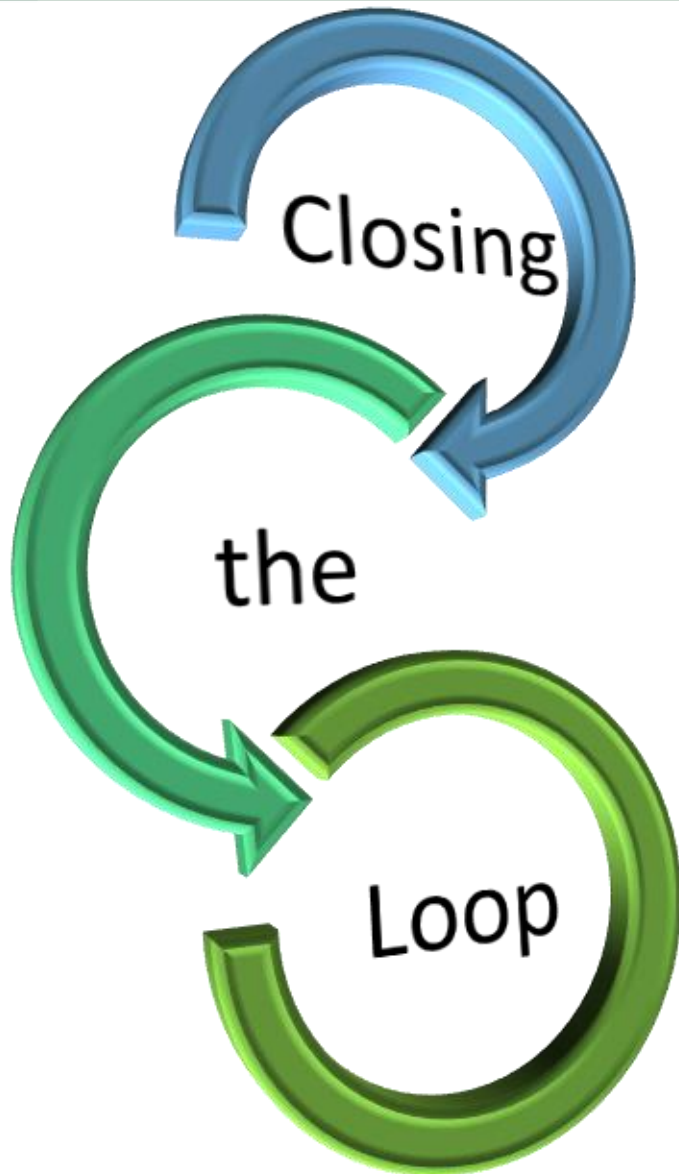
- As patient arrives at or consumes the prescribed services NowPow **API** notifies the Rush EHR "closing the loop"

- If patient does not consume a service, social workers may "nudge" the patient via text or email reminders and communication

Tracking Outcomes with Analytics

- Real-time API feeds from NowPow into the EHR and data warehouse

- Analytics for Improving the health of our population
    - Identify lack of critical resources or services (identifying "healthcare deserts")
    - Correlating SDOH to specific diseases and appropriate, precision treatments
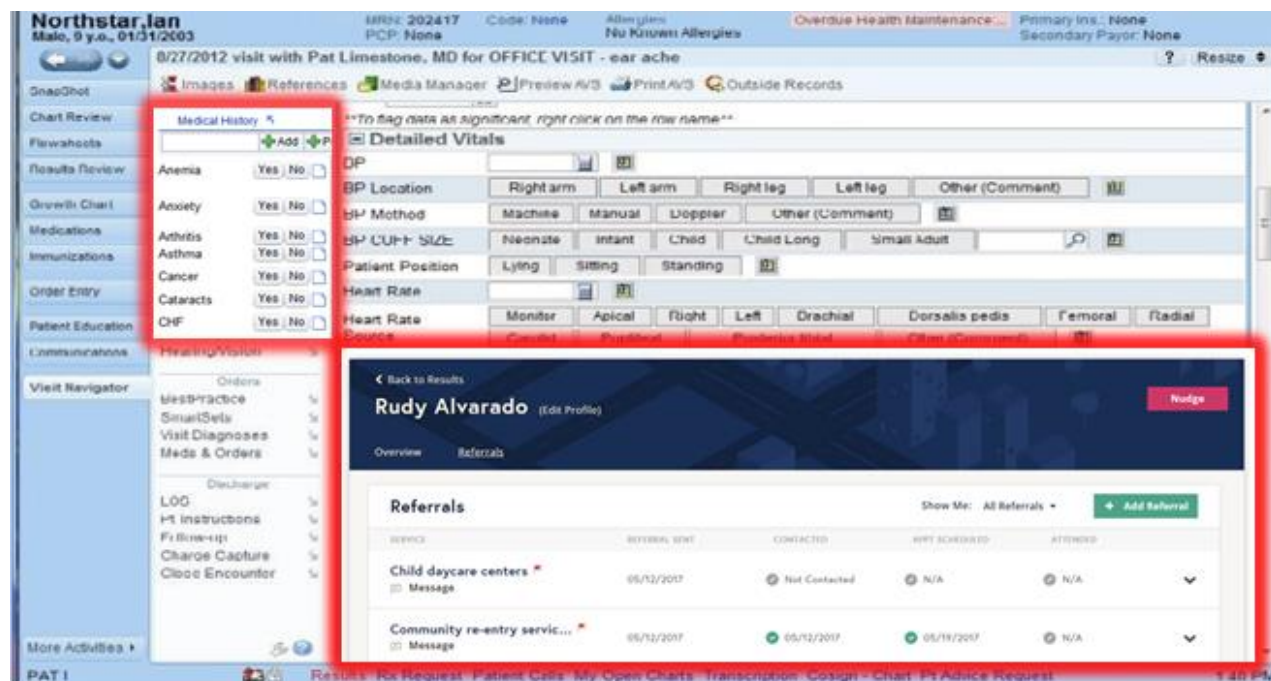   - Tracking and improving outcomes

Traditional HL7 Push Model 3rd Party Integration

Near-real Time at Best
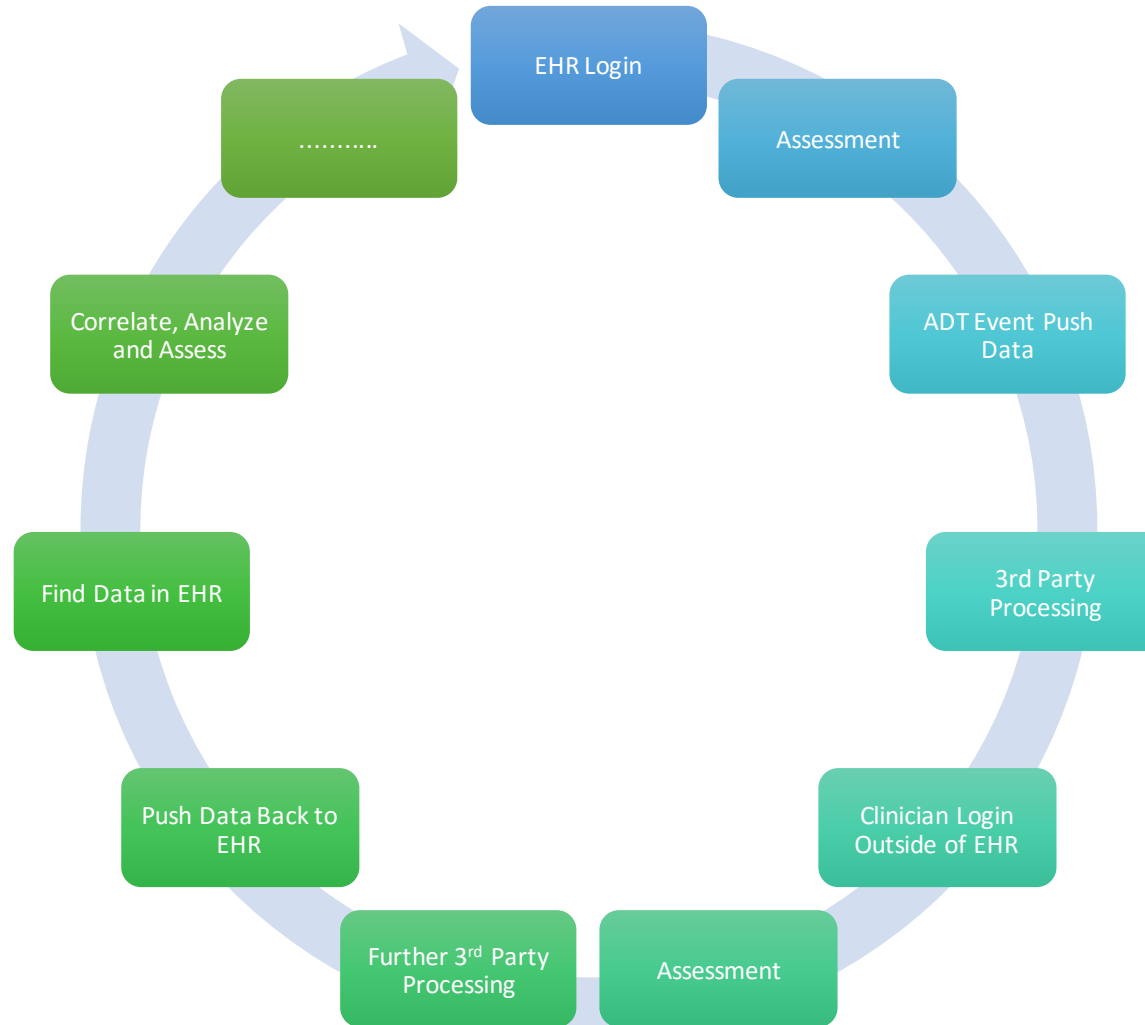
Same 3rd Party Integration Using *SMART on FHIR*

API Exchange of data in real-time provides a seamless user experience giving the impression the EHR itself is doing the work - clinician never has to leave the chart.

FHIR Push of patient data in context of patient and with the correct security of the provider

Real-time, integrated feedback to the provider

```
{
  "resourceType": "Patient",
  "id": "example",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "coding": [
          {
            "system": "http://hl7.org/fhir/v2/0203",
            "code": "MR"
          }
        ]
      },
      "system": "urn:oid:1.2.36.146.595.217.0.1",
      "value": "12345",
      "period": {
        "start": "2001-05-06"
      },
      "assigner": {
        "display": "Acme Healthcare"
      }
    }
  ],
}
```

Thank You
&
Discussion

Contact or Follow Dr. Shafiq Rab

✉ Shafiq_Rab@rush.edu   🐦 @CIOSHAFIQ

HL7 Plenary Meeting Notes:

HL7's 31st Annual Plenary

Keynote Session 5: The Algorithm for Precision Medicine

11:30 – 12:00 pm

*****

Matthew Might, PhD

Director, Hugh Kaul Personalized Medicine Institute,
University of Alabama at Birmingham

Keynote Speaker 5

Matthew Might, PhD

Director of the Hugh Kaul Personalized Medicine Institute, Hugh Kaul Endowed Chair of Personalized Medicine, Professor of Medicine & Professor of Computer Science, University of Alabama at Birmingham

Dr. Might is the Inaugural Director of the Hugh Kaul Personalized Medicine Institute, the Hugh Kaul Endowed Chair of Personalized Medicine, and both a Professor of Medicine and Professor of Computer Science at the University of Alabama at Birmingham.

Dr. Might has served as a Strategist in the Executive Office of the President at the White House for both the prior and current administration. He is the Chief Science Officer of NGLY1.org and a Co-Founder and Scientific Advisor to Pairnomix, LLC.

He was previously an Associate Professor of Computer Science and Adjunct Associate Professor of Pharmaceutical Chemistry at the University of Utah. He received his PhD in computer science from Georgia Tech in 2007. He tweets from @mattmight and blogs at blog.might.net.

Slides not available in advance for Dr. Might's presentation.

HL7 Plenary Meeting Notes:

HL7's 31st Annual Plenary

Closing Comments

12:00 – 12:30 pm

*****

Pat Van Dyke, RN
Chair, HL7 International Board of Directors

HL7 Plenary Meeting Notes: