



The Peaks & Pitfalls of Artificial Intelligence

November 20, 2018

Agenda

- **Welcome**
 - **Jennifer Covich Bordenick**, CEO, eHealth Initiative and Foundation
- **Discussion & Comments**
 - **David Cohen**, Division Vice President, *Cerner*
 - **Lindsey Jarrett, PhD**, Lead Strategist, Cerner's Intelligence Organization, *Cerner*
 - **Matthew Keating**, Director, *Booz Allen Hamilton*
- **Q & A**



Housekeeping Issues

- All participants are muted
 - To ask a question or make a comment, please submit via the Q&A feature and we will address as many as possible after the presentations
- Technical difficulties:
 - Use the chat box and we will respond as soon as possible
- Questions:
 - Use Q&A feature
- Today's slides will be available for download on eHI's Resource page **www.ehidc.org/resources**



Our Mission

eHealth Initiative's mission is to serve as the industry leader convening executives from multi-stakeholder groups to identify best practices to transform healthcare through use of technology and innovation. eHI conducts, research, education and advocacy activities to support the transformation of healthcare.



Multi-stakeholder Leaders in Every Sector of Healthcare



Current Initiatives and Member Meetings

Convening
Healthcare
Executives
to Conduct
Research &
Identify Best
Practices

- Technology and Analytics to Improve Patient Care
- Workflow for Quality Improvement
- Data Governance: A Framework for Value-Based Care
- Addressing Privacy in Non-HIPAA Covered Entities
- Effects of Prior Authorization in Healthcare
- Sharing Behavioral Health Information in Light of the Opioid Epidemic
- Clinical Data Drives Success in VBC for Medicaid MCO
- Leveraging Patient Data to Improve Outcomes and Reduce Costs
- Influence of Artificial Intelligence on Healthcare
- Improving Pop Health by Addressing SDOH With A Multi-Stakeholder Approach
- Electronic Medication Adherence and Patient Safety



eHealth Resource Center Available With Best Practices & Findings

Best Practice Committees contribute to the eHealth Resource Center www.ehidc.org/resources which provides assistance, education and information to organizations transforming healthcare through the use of information, technology and innovation. The Resource Center is a compilation of reports, presentations, survey results, best practices and case studies from the last 16 years.



Download Our New Reports at www.ehidc.org

*Artificial Intelligence in
Healthcare*



*The Machines Are Here &
Improving Healthcare*



Artificial Intelligence in Healthcare



Lindsey Jarrett, PhD
Lead Strategist, Cerner's
Intelligence Organization



David Cohen
Division Vice President



AI Advantage by Thomas Davenport*



AI Can Support 3 Business Needs:

1. Robotic & Cognitive Automation: Automating Business Processes
2. Cognitive Insight: Gaining Insight Through Data Analysis
3. Cognitive Engagement: Engaging with customers and employees

Virtual observations to reduce patient falls and operational costs

Between 700,00 and 1,000,000 people in the United States suffer from preventable falls in the hospital every year. These falls contribute to a range of complications and increased healthcare utilization.¹⁷ In 2016, Atrium Health implemented a 3D-motion tracking camera system, based on AI that monitors fall-risk patients at Carolinas Rehabilitation hospitals. The system enables the hospital to observe 12 patients at a time with one staff member at the centralized monitoring station, reducing costs of sitters, restraints and net beds. The motion detector alerts the monitoring technician of patient movement, prompting a recording asking the patient to return to bed; two-way audio communication with nurses; and bedside assistance with the care team. Since implementation of the system, there have been zero falls for the patients observed, while the overall unassisted fall rate fell 51 percent.¹⁸



Patient

2 Way Audio



Monitoring
technician

- System agnostic
- One camera sensor per patient bed
- Central monitoring station
- Visual and audio alerts
- Two-way room communication





Reduces Falls

3D zones positioned around the patient bed or chair



Patient Safety

Safety zones to detect tampering with invasive line/tube placement



Patient Elopement

Wide angle of room to detect elopement



Visitor Monitoring

Patient safety zones to prevent drug diversion and abuse

Additional use cases

All while significantly reducing sitter costs

Mission Health

The Asheville, N.C., based health system added Cerner Patient Observer to six neurosurgical unit patient beds in August 2015. During the study, the average falls rate – as measured per 1,000 patient days of care – dropped from four per month to zero.

Mission Health reduces falls to zero, cuts the \$4.8 million in cost avoidance only the beginning



Mission Health adds Cerner Patient Observer results in zero falls, ROI and planned future enhancements

Mission Health is piloting a brand new observation solution to help reduce patient falls, especially falls with injury. Through a testing partnership with Cerner, the Asheville, N.C., based health system added Cerner Patient Observer to six neurosurgical unit patient beds in August 2015.

During the 3-month study, the average falls rate – as measured per 1,000 patient days of care – dropped from four per month to zero.

"Falls are something that several well intentioned interventions have not solved," said Marc Weisbe, DO, FAAP, senior vice president of innovation. "No one wants their patient hurt, and it causes unnecessary costs."

Patient falls can cause increased lengths of stay and greater liability. According to [a study published by The Joint Commission](#), a fall with injury costs an average of \$14,000. By preventing just 20 falls with injury, a hospital could save over a quarter of a million dollars.

"Any unit with a falls problem should have this solution," said Weisbe.

Team efforts to optimize

The pilot project, led by the Mission Center for Innovation, began with an introduction of the technology in 2015. Through a rigorous process of defining a falls risk care plan, Mission Center for Innovation collaborated with Mission Hospital's Neuroscience unit, which had a relatively robust observation work a fall virtually from falls risk.

New demands on health care

Reactive sick care



Proactive health management

Fragmented niche care



Cross-continuum care system

Reward for volume



Reward for quality, safety and efficiency

Clinician-centric



Person & Care Team-centric

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

MATT KEATING

Principal, Booz Allen



@keatinme



/keatinme

HYPE

AND REALITY...

 cnbc.com

**A.I. could lead
to a nuclear
war by 2040,
think tank
warns**

Apr. 25th, 2018

 bloomberg.com

**AI Will Give
Us Better
French Fries**

Apr. 26th, 2018

Ingenuous Humans vs Intelligent Machines

Today, machines can outpace humans on some complex tasks, while a three-year old child can intuitively understand a scenario that even the most advanced AI cannot comprehend

Intelligent Machines *Can...*

- Respond to human commands
- Drive down a major highway
- Select the best treatments for disease
- Write poems, music, and artwork
- Learn human tastes, preferences
- Outperform humans at strategy games
- Learn to perform narrow tasks better than humans

Cannot...

- Speak conversationally about any topic you choose
 - Drive in dense cities or bad weather
 - Create art that is better than humans'
 - Understand human emotion, humor
 - Invent new games to play
 - Teach itself new skills independently
-

Machines can learn...

1. Fill in gaps in existing knowledge

2. Emulate the human brain

3. Simulate evolution over generations

4. Systematically reduce uncertainty

5. Find similarities between old and new

Five approaches to structuring machine learning algorithms

"Tribe"	Origins	Motivation	Technical Approach
<u>Symbolists</u>	Logic, Philosophy	Automate the scientific method	Inverse Deduction
<u>Connectionists</u>	Neuroscience	Reverse engineer the human brain via math model of neurons	Backpropagation
<u>Evolutionaries</u>	Evolutionary Biology	Replicate the evolution of the human brain over generations	Genetic Programming
<u>Bayesians</u>	Statistics	Test hypotheses to determine the certainty of knowledge	Probabilistic Inference
<u>Analogizers</u>	Psychology	Use previous problems / solutions and extrapolate into new context	Kernel Machines

USE CASES

GENERAL

- Detecting objects
- Text spotting
- Learning a new environment
- Projection
- Adversarial Machine Learning
- Understanding human Behavior?

SPECIFIC

- Image-based disease detection
- Dictation Lens
- Speech analysis
- Predicting LOS and readmission
- Propensity to pay
- FWA

PARTING THOUGHTS...

- Machines lack *Judgement* -- raises the importance of wisdom and good human judgment
- Context for machines is *Mathematical* -- humans have a broader experience set to draw upon (can be good and bad...bias)
- No comprehensive, usable framework exists for ethics and privacy in using these technologies
- If you don't have a strategic program to "label" your data -- start now or get left behind
- 'Open Data' is good ... But exclusive data is a must for superiority

“ As complex and challenging as **TECHNOLOGY** can be,
the hardest parts to get right are **LEADERSHIP** and **STRATEGY** ”

Q&A



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