The power of analytics
Transforming data into actionable insights

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Imagination at work.
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HEALTHCARE PROFESSIONALS ARE RESPONSIBLE FOR MAKING INDEPENDENT CLINICAL DECISIONS AND APPROPRIATELY BILLING, CODING AND DOCUMENTATION THEIR SERVICES. This example is not intended to interfere with a health care professional's independent clinical decision making. Other important considerations should be taken into account when making purchasing decisions, including clinical value. The health care provider has the responsibility, when billing to government and other payers (including patients), to submit claims or invoices for payment only for procedures which are appropriate and medically necessary and in accordance with applicable laws. You should consult with your reimbursement manager or healthcare consultant, as well as experienced legal counsel, prior to any expansion of service.

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What is Big Data?

**Volume**
Data Quantity

**Variety**
Data Types

**Velocity**
Data Speed

**Value**
Data Impact
12th player in football – Big Data analytics

Result: Tottenham vs. Manchester City
0-6
(English Premier League, 2013)

Result: Arsenal vs. Sunderland
4-1
(English Premier League, 2013)

Result: World Cup 2014 Winner
Germany

Healthcare is under pressure

Results: Raising costs, waste, and inefficiencies

5 https://www.aamc.org/download/286592/data/
8 http://www.reuters.com/article/2013/06/28/us-brazil-doctors-idUSBRE95R13N20130628
9 Sept 2014, Peer360 research report – Unnecessary Imaging, Up to $12 Billion Wasted Each Year
A convergence of enabling technologies is setting the stage for industry transformation

1. **Internet of Things**
   - “Hospital of Things” plethora of devices
   - Accelerating Bio-sensor market/use
   - Mobile healthcare explosion – $27B by 2017

2. **Intelligent Machines**
   - Machines protecting and treating patients
   - Devices for new care givers and settings
   - Algorithms as updatable content

3. **Big Data**
   - High volume of data from physiology monitoring
   - Care shift from population median to high-def individual

4. **Analytics**
   - Forecasting and predicting future health
   - End of fee-for-service models drives data collect and analysis

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1 $27B by 2017 for Mobile health services:
The market for mHealth services has now entered the commercialization phase and will reach $26 billion globally by 2017 according to new “Global Mobile Health Market Report 2013-2017” by research2guidance. The report is one of the leading publications in the mHealth market. Companies that have purchased previous editions of the report includes: Agfa Healthcare, DTAG, Fresenius, Fujitsu, GE Healthcare, LG, Nokia, Novartis, Pfizer, Qualcomm, Roche, Roland Berger, Sanofi Aventis and many more.
Creating insight from Big Data

Outcomes

Clinical Quality
Operational Efficiency
Financial Performance

Data ➔ Actionable Insights ➔ Outcomes
Big Data analytics – maturity model and value

- **Descriptive analytics**
  - What & why it happened?

- **Predictive analytics**
  - What will happen?

- **Prescriptive analytics**
  - What should be done?
A transformational shift happening in healthcare delivery

**Past**
- Patient care
- Episodic of care
- Cure the symptom
- Heal the sick

**Future**
- Population care
- Clinical pathway
- Discover the cause
- Prevent the sickness
Traditional role of patients and doctor is changing

- **Patients** record clinical data
- **Data** determines need for doctor’s visit
- **Patients** share data to compare treatment options
- **Smart devices** are a source of information on stroke
- **Home-health devices** alert clinical intervention

1 Smartphone apps are a significant source of information related to stroke. An increasing participation of healthcare agencies should be encouraged to promote dissemination of scientifically valid information. *J Stroke*. 2014 May;16(2):86-90. doi: 10.5853/jos.2014.16.2.86. Epub 2014 May 30. Smart phone applications as a source of information on stroke. Dubey D1, Amritphale A2, Sawhney A3, Amritphale N4, Dubey P5, Pandey A1
Efficient hospital operations

- **Optimize Patient Safety & Security**
  - ER returns within 72 hours
  - Hospital induced patient accidents

- **Efficiency & Performance**
  - Patient wait times and diagnosis turnaround time
  - Asset & labor utilization rates

- **Costs Savings**
  - Material/equipment consumption rates
  - Bed blockers (Length Of Stay > 30 days)

- **Clinical Insights**
  - Data algorithm to predict sepsis
  - Data algorithm to predicted future risk of metabolic syndrome

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1. Gregory B. Steinberg, MB, BCh; Bruce W. Church, PhD; Carol J. McCall, FSA, MAAA; Adam B. Scott, MBA; and Brian P. Kalis, MBA - See more at: ttp://www.ajmc.com/publications/issue/2014/2014-vol20-n6/Novel-Predictive-Models-for-Metabolic-Syndrome-Risk-A-Big-Data-Analytic-Approach#sthash.yxMBQq2L.dpuf

Integrating imaging, data, and analytics to help win against cancer
Outcomes: **Clinical Study**

Predicting individualized risk of Metabolic Syndrome in patients\(^1,2\)

Country-level Estimates of Diagnosed Diabetes among Adults ≥ 20 years United States 2009

Cost of diabetes in US now $245 Billion\(^2\)

Regular doctor visit

**Actionable insights**

1. >30% US population has Metabolic Syndrome\(^1,2\)
   Algorithms used to predict probability\(^1,2\)

2. Regular doctor visit lowers risk in 90% of individuals\(^1,2\)

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1 Novel Predictive Models for Metabolic Syndrome Risk: A “Big Data” Analytic Approach Published Online: June 26, 2014 Gregory B. Steinberg, MB, BCH; Bruce W. Church, PhD; Carol J. McCall, FSA, MAAA; Adam B. Scott, MBA; and Brian P. Kalis, MBA See more at: http://www.ajmc.com/publications/issue/2014/2014-vol20-n6/Novel-Predictive-Models-for-Metabolic-Syndrome-Risk-A-Big-Data-Analytic-Approach#sthash.4WzKre10.dpuf

Data: **Clinical** – Population health management

Risk management and return on intervention

Focus on the right interventions with the most actionable patients

Risk Management, powered by LexisNexis® with MEDai science, identifies populations of patients, stratifies them (by risk, utilization, motivation and other factors), predicts costs and potential savings, and supports care management to drive better outcomes. The numbers represented in this slide resulted from an internally developed scenario specifically for demonstration purposes to show the value of combining the predictive results from Caradigm’s MEDai to find the people who would be most impacted by intervention and management over the next 12 months rather than focusing on only those who were the highest cost, highest risk retrospectively (past 12 months).
Critical success factors – key take aways

1. Data “liquidity” is crucial – unlock the data sitting in disparate systems

2. Focus and prioritize top opportunities to analyze

3. Get some key wins to affect change in the organization to implement key actions