Ledelsesinformation og beslutningsstøtte med Analytics
Reel mulighed eller modefænomen?

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Reel mulighed eller modefænomen?

- **Reel mulighed?**
  - Der er mere data end nogensinde og den er billig at fremskaffe, opbevare og analysere, så grobund for at løse udfordringer på nye måder og ikke bare optimere
  - Pres på sundhedssektoren for højere kvalitet, mere behandling og forbrug af færre ressourcer, så grobund for forandring

- **Modefænomen?**
  - Forbliver modefænomen hvis ikke det faktisk øger kvalitet og sænker omkostninger, men blot er lovende eksperimenter der kommer de få til gode
  - Skal udnytte allerede foretagende investeringer i IT, komme mange til gode og ikke blot føre til serviceløft
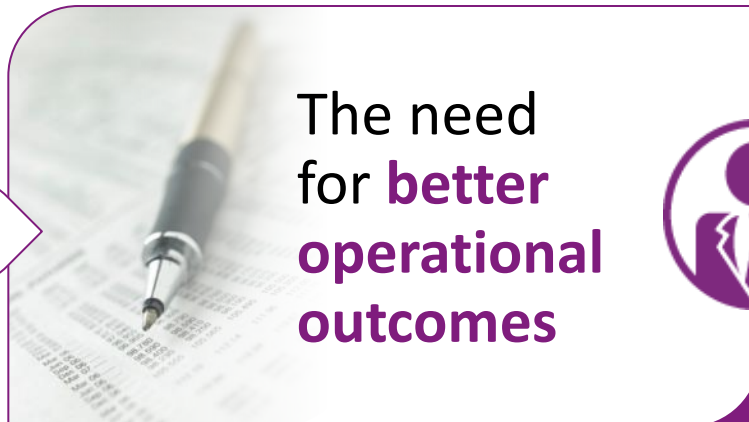
SmarterAnalytics

IBM

Inconsistent quality and increasing costs require healthcare transformation in key areas

The need for **better clinical outcomes**

- **One in five patients** suffer from preventable readmissions ... represents **$17.4 billion of the current $102.6 billion Medicare budget***
- **1.5 million** patients in the U.S. harmed annually by errors in the way medications are prescribed, delivered and taken
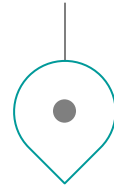
The need for **better operational outcomes**

- In 2012, **Hospitals will be penalized** for high readmission rates - Medicare discharge payments starting will be reduced in key areas**
- **$475 billion:** Estimated annual US healthcare spending on administrative and clinical waste, fraud, abuse and other waste

New England Journal of Medicine – Rehospitalization Among Patients in the Medicare Fee-for-Service Program, April 2009
** http://www.healthleadersmedia.com/content/COM-263665/3-Readmissions-to-Reduce-Now*

... but the biggest blind spot still remains

- How are you measuring and reducing preventative readmissions?
- How are you providing clinicians with targeted diagnostic assistance?
- Which patients are following discharge instructions?
- How are you leveraging unstructured data to prevent and detect fraud?
- How are you using data to predict intervention program candidates?
- **Would revealing insights trapped in unstructured information facilitate more informed decision making?**

Does unlocking the unstructured data help accelerate your transformation?
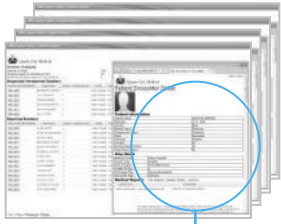
✓ Physician notes and discharge summaries
✓ Patient history, symptoms and non-symptoms
✓ Pathology reports
✓ Tweets, text messages and online forums
✓ Satisfaction surveys
✓ Claims and case management data
✓ Forms based data and comments
✓ Emails and correspondence
✓ Trusted reference journals including portals
✓ Paper based records and documents

Over 80% of stored health information is unstructured*

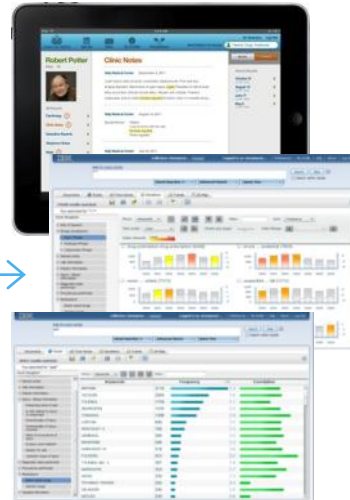## IBM Content and Predictive Analytics for Healthcare
What's so innovative?

*A **42-year old white male** presents for a physical. He recently had a right **hemicolectomy** invasive grade 2 (of 4) adenocarcinoma in the ilocecal valve was found and excised. At the same time he had an **appendectomy.** The appendix showed no diagnostic abnormality.*

Patient
Age: 42
Gender: Male
Race: White

Procedure **hemicolectomy**
diagnosis: invasive adenocarcinoma
anatomical site: ileocecal valve
grade: 2 (of 4)

Procedure **appendectomy**
diagnosis: normal
anatomical site: appendix

Physicians
Other Clinicians
Care Coordinators
Researchers

Executives
Business Analysts
Claims
Fraud

Knowledge Workers

Other Systems and Applications

Accurately extract buried medical facts and relationships with **medical annotators**

Analyze compiled information for trends, patterns, deviations, anomalies and relationships in aggregate to reveal new insights with **content analytics**

Model, score and predict the probability of outcomes with **predictive analytics**

Make insights accessible and actionable for all clinical and operational knowledge workers (and systems)

Confirm hypotheses or seek alternative ideas from learned knowledge via Watson for Healthcare from the same user interfaces*

* Future capability

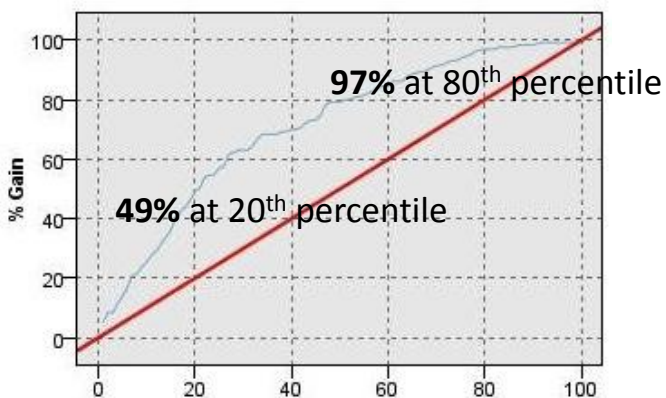# What Really Causes Readmissions at Seton
Key Findings

The Data We Thought Would Be Useful … Wasn't

- 113 candidate predictors from structured and unstructured data sources

- Structured data was less reliable then unstructured data – increased the reliance on unstructured data

New Unexpected Indicators Emerged … Highly Predictive Model
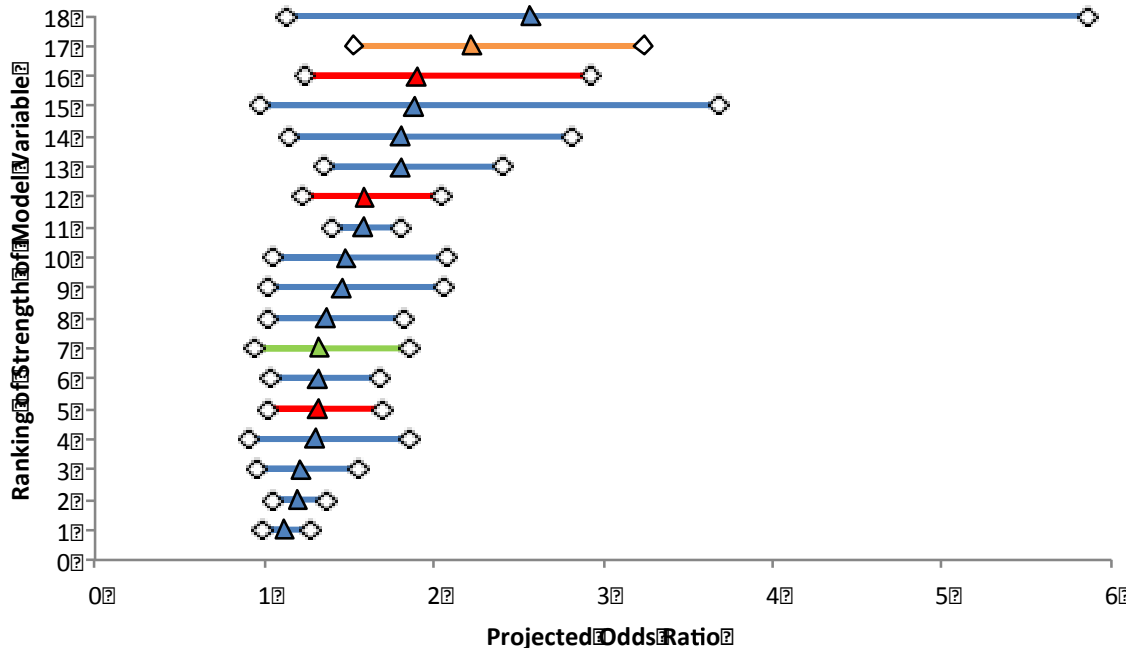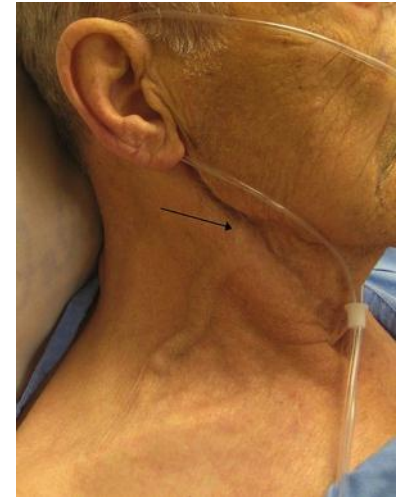
- 18 accurate indicators or predictors (see next slide)

97% at 80th percentile

49% at 20th percentile

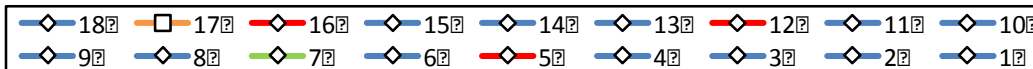| Predictor Analysis	% Encounters Structured Data	% Encounters Unstructured Data
Ejection Fraction (LVEF)	2%	74%
Smoking Indicator	35% (65% Accurate)	81% (95% Accurate)
Living Arrangements	<1%	73% (100% Accurate)
Drug and Alcohol Abuse	16%	81%
Assisted Living	0%	13%

What Really Causes Readmissions at Seton
Top 18 Indicators

New Insights Uncovered by Combining Content and Predictive Analytics

- LVEF and Smoking are significant indicators of CHF but not readmissions

- Assisted Living and Drug and Alcohol Abuse emerged as key predictors (only found in unstructured data)

- Many predictors are found in "History" notations and observations

18. Jugular Venous Distention Indicator

17. Paid by Medicaid Indicator

16. Immunity Disorder Disease Indicator

15. Cardiac Rehab Admit Diagnosis with CHF Indicator

14. Lack of Emotion Support Indicator

13. Self COPD Moderate Limit Health History Indicator

12. With Genitourinary System and Endocrine Disorders

11. Heart Failure History

10. High BNP Indicator

9. Low Hemoglobin Indicator

8. Low Sodium Level Indicator

7. Assisted Living (from ICA Extract)

6. High Cholesterol History

5. Presence of Blood Diseases in Diagnosis History

4. High Blood Pressure Health History

3. Self Alcohol / Drug Use Indicator (Cerner + ICA)

2. Heart Attack History

1. Heart Disease History

Reel mulighed!

▪ **Udnytter eksisterende data.** Anvendelse af al information, ikke kun det i databaser, men også de 80% der befinder sig i f.eks. tekst

▪ **"Best practice" for alle.** Anvendelse af information om patienten, men også forskningsartikler, retningslinier mv

▪ **Beslutningsstøtte.** Anvendelse af prædikativ analyse til at give prognoser for den enkelte patient

▪ **Ikke blot serviceløft.** Billig computerkraft så alle patienter kan vurderes hvilke giver højere kvalitet og lavere omkostninger (eks færre genindlæggelser)