



# Clinical Decision Support and Natural Language Processing: Where Next?

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NLM/NIBIB Workshop on Natural Language Processing:

State of the Art, Future Directions, and Applications for Enhancing Clinical Decision Support

Bethesda, MD – April 24, 2012



# CDS and NLP: Where Next?

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**“The chief merit of language is clearness, and we know that nothing detracts so much from this as do unfamiliar terms.”**

Galen  
*On the Natural Faculties*  
*Book I*



# CDS and NLP: Where Next?

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- National Quality Strategy
- National Healthcare Quality and Disparities Reports

## ***Challenges***

# National Quality Strategy

- Part of Affordable Care Act; report submitted to Congress in 2011
- Builds on work of federal, state, local and private initiatives; identifies what works and what needs improvement
- Move from provider-level transparency to a patient-focused approach





# National Quality Strategy: Three Broad Aims

## Better Care

Improve the overall quality, by making health care more patient-centered, reliable, accessible and safe

## Healthy People/ Healthy Communities

Support proven interventions to address behavioral, social and environmental determinants of health, in addition to delivering higher-quality care

## Affordable Care

Reduce the cost of quality health care for individuals, families, employers and government

[www.ahrq.gov/workingforquality/#iwg](http://www.ahrq.gov/workingforquality/#iwg)



# Strategy Identifies Six Initial Priorities

- Make care safer by **reducing harm** caused in the delivery of care
- Ensure that **each person and family is engaged** as partners in care
- Promote **effective communication and coordination of care**
- Promote most **effective prevention and treatment practices** for leading causes of mortality, starting with cardiovascular disease
- Work with communities to **promote wide use of best practices** to enable healthy living
- Make **quality care more affordable** for individuals, families, employers and government by developing/spreading new delivery models

# National Healthcare Quality and Disparities Reports

- New editions released Friday
  - Overall health care quality in the US continues to improve at a slow rate
  - Access to health care is not improving for most racial and ethnic groups
  - On average, Americans receive appropriate acute care services, recommended chronic disease management services and preventive care services most of the time
  - Cardiac care has improved significantly





# Overview: 2011 NHQR/DR

- Expanded to include new data on children's health, musculoskeletal diseases
- New data on adoption of EHRs
- As with the 2010 reports, benchmarks are aligned with six priorities in the National Strategy for Quality Improvement in Health Care
  - Making Care Safer
  - Ensuring Person- and Family-Centered Care
  - Promoting Effective Communication and Coordination of Care
  - Promoting Most Effective Prevention and Treatment for Leading Causes of Mortality
  - Working with Communities To Support Better Health
  - Making Quality Care More Affordable





# CDS and NLP: Where Next?

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**“It is the great mystery of life itself which is at the bottom of all the mysterious language we are obliged to employ concerning it.”**

Peter Mere Latham  
*Collected Work, Book II*



# CDS and NLP: Where Next?

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- Evidence report on Clinical Decision Support systems
- Funding opportunities to understand consumer and clinician information needs
- Institute of Medicine recommendations

***New research directions***



# New AHRQ-funded EPC Report On Clinical Decision Support

- Impact of Clinical Decision Support Systems: A Systematic Review
- Published April 23 in *Annals of Internal Medicine*
- Report online at [www.ahrq.gov](http://www.ahrq.gov)
- Key findings:
  - CDS improves process measures
  - Limited impact on clinical and electronic outcomes
  - Successful implementation features named
  - More research needed

**Annals of Internal Medicine**

*Established in 1927 by the American College of Physicians*



# CDS and NLP: Where Next?

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**“The graveyard of failed products and services is populated by things that people *should* have wanted... understanding the job that customers are trying to do is a major issue in *every* healthcare innovation.”**

Clayton Christensen  
*The Innovator's Prescription*



# Health IT R01 FOAs

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- Understanding Clinical Information Needs and Health Care Decision Making Processes in the Context of Health Information Technology (IT) (R01) FOA:
  - <http://grants.nih.gov/grants/guide/pa-files/PA-11-198.html>
- Understanding User Needs and Context to Inform Consumer Health Information Technology (IT) Design (R01) FOA:
  - <http://grants.nih.gov/grants/guide/pa-files/PA-11-199.html>





# CDS and NLP: Where Next?

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**“The best part of human language, properly so called, is derived from reflection on the acts of the mind itself.”**

Samuel Coleridge  
*Biographia Literaria*



# IOM Recommendation

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- Guideline developers should structure the format, vocabulary, and content of CPGs to facilitate ready implementation of CDS
- CPG developers, CPG implementers, and CDS designers should collaborate in an effort to align their needs with one another

*Clinical Practice Guidelines We Can Trust*  
Institute of Medicine, 2011



# CDS and NLP: Where Next?

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- Natural Language Processing

***Opportunities***

# CDS and NLP: Where Next?

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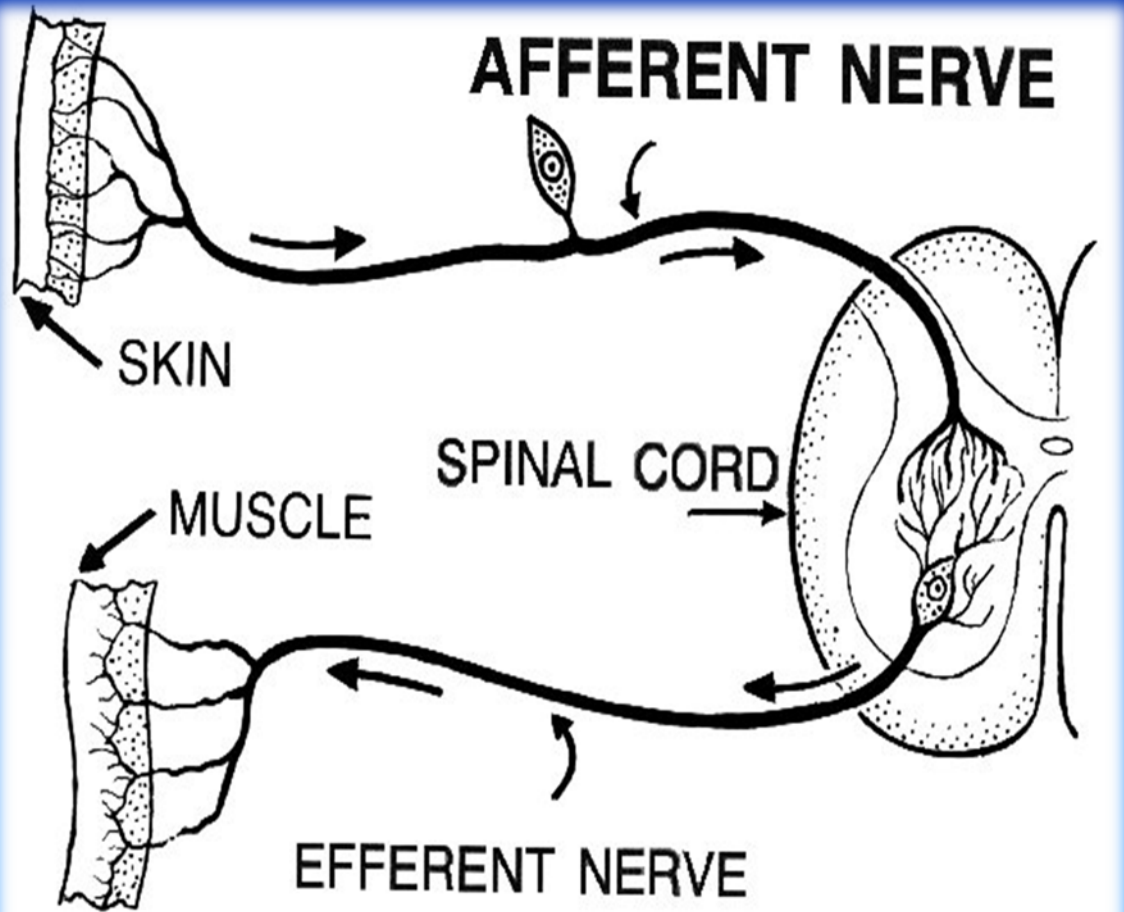
**“It is impossible to dissociate language from science or science from language... To call forth a concept a word is needed; to portray a phenomenon, a concept is needed. All three mirror one and the same reality.”**

Lavoisier  
*Traite Elementaire de Chimie*

# 'Big Data'

Information  
from the  
system

Decision  
support out



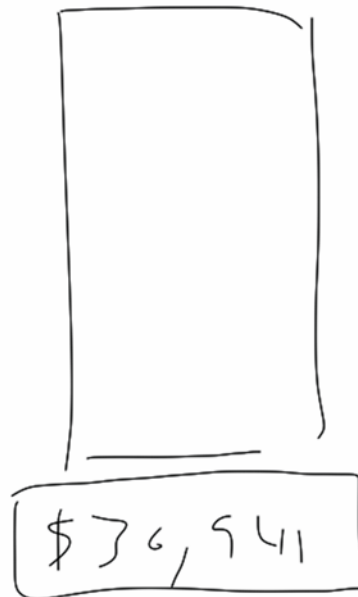


# CDS and NLP: Where Next?

"Sherlock"



"Watson"



**"There are 50 who  
can reason  
synthetically for  
one who can  
reason  
analytically."**

Arthur Conan Doyle

# CDS and NLP: Where Next?

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**“Poets in our civilization, as it exists at present, must be *difficult*... The poet must become more and more comprehensive, more allusive, more indirect, in order to force, to dislocate if necessary, language into its meaning.”**

T.S. Eliot  
*The Metaphysical Poets*

# Thank You

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## **AHRQ Mission**

To improve the quality, safety, efficiency, and effectiveness of health care for all Americans

## **AHRQ Vision**

As a result of AHRQ's efforts, American health care will provide services of the highest quality, with the best possible outcomes, at the lowest cost