The Timeline to Diagnostic Safety
SIDM - Research as a Priority

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Founder and President – SIDM
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VISION: Creating a world where no patients are harmed by diagnostic error

The Veiled Man -- Irene Vilar
<table>
<thead>
<tr>
<th>Field</th>
<th>Starting Point</th>
<th>Progress to Date</th>
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<tbody>
<tr>
<td>Aviation</td>
<td>1930’s: 1 crash/1000 flights. Of first 24 air mail pilots, half died</td>
<td>1974 (ASRS)</td>
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<tr>
<td></td>
<td></td>
<td>&lt;One crash per 10,000,000 flights.</td>
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<tr>
<td>Lab Medicine</td>
<td>1950: Half of lab results not credible</td>
<td>1967 (CLIA)</td>
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<td></td>
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<td>On automated labs: &lt;1 defect/100,000</td>
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<tr>
<td>Patient Safety</td>
<td>180,000 deaths/yr</td>
<td>1999 (To Err..)</td>
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<tr>
<td></td>
<td></td>
<td>100,000 lives? 5,000,000 lives?</td>
</tr>
<tr>
<td>Diagnostic Safety</td>
<td>40,000 – 80,000 deaths/yr</td>
<td>2008 (DEM)</td>
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<td></td>
<td>???</td>
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Evidence of Progress

IOM Report

Downloaded 15,000 times

Evidence of action from: AHRQ, CDC

http://nas.edu/improvingdiagnosis
Evidence of Progress

Increased awareness:

Papers, Grand Rounds, Radio, TV, Webinars

Susquehanna Health - 4th Grand Rounds on Dx Error
Evidence of Progress

Diseases with successful campaigns:

Kernicterus

Sepsis
Evidence of Progress

HCO’s\PSO’s starting to DO something

Intermountain - New team
Maine Medical Center – Communicating tests
MMIC, MCIC – New collaborations
Midwest Alliance for Safety – PSO project
Atrius Health – Funded research project
KP Southern California - SureNet trigger tools
Evidence of Progress

Education

New texts: Teaching Clinical Reasoning
New Fellowship program: Diagnostic medicine
6 new Med-U modules on dx error
New courses: Critical thinking @ Dalhousie
New CME modules on dx error, with ACP
On the AAMC meeting program – 2016
AAMC – Newest member of Coalition
Evidence of Progress

International Progress

DEM – EU  2016
DEM - Australia  2017

John Ely’s checklists – Translated into French, Turkish, and Indonesian
Interest groups in: Romania, Japan, China
WHO discussions
Australia CEC: Red Team – Blue Team
Take 2: Stop and Do
Coalition to Improve Diagnosis (CID)

American Board of Internal Medicine and the ABIM Foundation
American Board of Medical Specialties
American College of Emergency Physicians
American College of Physicians
American Society of Healthcare Risk Managers
Consumers Advancing Patient Safety
Leapfrog Group
National Patient Safety Foundation
National Partnership of Women and Families
National Association of Pediatric Nurse Practitioners
Society to Improve Diagnosis in Medicine
Department of Veterans Affairs

And a dozen more ......
Advisory: AHRQ, CDC
Research Priorities

IOM suggestions
SIDM suggestions
My suggestions
Your suggestions
HHS, DOD, VA: Develop a coordinated and funded research agenda by 2016

41 specific research recommendations:

- Patient & family engagement – 6
- Educating healthcare professionals – 5
- Health IT – 7
- Finding, analyzing, reducing Dx error – 15
- Work system improvements – 4
- Policy and finance - 4
Definition of Diagnostic Error

The failure to:

(a) establish an **accurate** and **timely** explanation of the **patient’s** health problem(s)

or

(b) **communicate** that explanation to the **patient**

The single biggest problem in communication is the illusion that it has taken place.  
George Bernard Shaw
Measuring Diagnostic Errors

The Diagnostic Process

- Patient Experiences a Health Problem
- Patient Engages with Healthcare System
- Information Gathering
- Information Integration & Interpretation
- Working Diagnosis

THE WORK SYSTEM
- Diagnostic Team Members
- Tasks
- Technologies and Tools
- Organization
- Physical Environment
- External Environment

Communication of the Diagnosis
- The explanation of the health problem communicated to the patient

Treatment
- The planned path of care based on the diagnosis

Outcomes
- Patient and System Outcomes
  Learning from diagnostic errors, near misses, and accurate, timely diagnoses

Failure of Engagement
- Failure in Information Gathering
- Failure in Information Integration
- Failure in Information Interpretation

Failure to Establish an Explanation for the Health Problem
- Failure to Communicate the Explanation
Human Factors

What factors make dx easier \harder?

What is the impact of distractions?

How much time is ‘enough’?

What is the impact of culture?
SIDM – Research Priorities

2011 - SIDM Research Committee (Chairs David Newman-Toker, Laura Zwaan, Rob El-Kareh)

2012 - SIDM Research Summit at DEM

2015 - SIDM input into IOM report and recommendations

2016 - SIDM-lead Coalition: Research funding is one of the 3 selected collective action items (along with raising awareness and collecting useful tools)
Advancing the research agenda for diagnostic error reduction

Laura Zwaan,¹ Gordon D Schiff,²,³ Hardeep Singh⁴,⁵


David E. Newman-Toker, MD PhD, Associate Professor, The Johns Hopkins University School of Medicine

Report presented to the IOM Committee on Diagnostic Error in Healthcare, August 7, 2014
MG: Research Priorities

How can we measure diagnostic performance??

How can we improve clinical reasoning?

What interventions work??

What’s the cost of Dx error?
How can we measure diagnostic performance?

NO: Incident reports, occurrence screens, death reviews, Global Trigger Tool

YES: Ask patients
    Ask doctors
    Use trigger tools
How can we improve clinical reasoning?

SHOULD we use a normative approach?

Why don’t we?

Which is more error prone – intuition or normative approach?
How do we teach people they are susceptible to bias?

How can we recognize it?

What can we do to minimize the adverse impact of bias?

Can we improve intuition?

Affective Bias

Cognitive Bias
What interventions work?

- Decision support?
- Second opinions?
- Debiasing; education?
- Teams?
- Engaged patients?
What’s the Cost of Dx Error?

Understanding the costs of dx error would motivate ….

Policy makers
Payers
Leaders of healthcare organizations
## Top 10 Causes of Death

<table>
<thead>
<tr>
<th>Cause</th>
<th>Count</th>
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<tbody>
<tr>
<td>Cardiovascular disease</td>
<td>596,339</td>
</tr>
<tr>
<td>Cancer</td>
<td>575,313</td>
</tr>
<tr>
<td>Chronic lower respiratory disease</td>
<td>143,382</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>128,831</td>
</tr>
<tr>
<td>Accidents</td>
<td>122,777</td>
</tr>
<tr>
<td>Alzheimer's disease</td>
<td>84,691</td>
</tr>
<tr>
<td>Diabetes</td>
<td>73,282</td>
</tr>
<tr>
<td><strong>DIAGNOSTIC ERROR</strong></td>
<td><strong>60,000</strong></td>
</tr>
<tr>
<td>Pneumonia and influenza</td>
<td>53,677</td>
</tr>
<tr>
<td>Kidney diseases</td>
<td>45,731</td>
</tr>
<tr>
<td>Suicide</td>
<td>38,285</td>
</tr>
</tbody>
</table>
**Causes of Death**

Data: GAO (costs) and CDC (deaths), in 2011

- 13.74
- 12.05
- 9.17
- 7.58
- 5.95
- 3.29
- 2.99
- 2.32
- 2.19
- 0.97
- 0.03
IOM Conclusions....

Diagnostic errors are a significant but underappreciated challenge to health care quality and harm an unacceptable number of patients.

In every research area that the committee evaluated, diagnostic errors were a consistent quality and safety challenge.
“Improving the diagnostic process is not only possible, but it also represents a moral, professional, and public health imperative.”
• Add these slides if Victor doesn’t cover them
The Toll of Dx Error

US

40,000 – 80,000 deaths/yr

1 in 20 primary care visits involves a preventable dx error; half are potentially harmful

Each Hospital

10 deaths every year

10 patients harmed every day in your clinics or ER

Diagnostic Error

Error-related Harm

Leape et al.  JAMA  288:2405, 2002
“The committee recognized that ... the available research estimates were not adequate to extrapolate a specific estimate or range of the incidence of diagnostic errors in clinical practice today.”

“It is likely that most of us will experience at least one diagnostic error in our lifetime, sometimes with devastating consequences.”

1 in 20 chance per year  X 80 years = approximately 100%
Where do they happen?

- **ER**  The petri dish for diagnostic errors
- **Inpatients**  One in ten diagnoses is probably wrong. 36,000 deaths in the ICU alone
- **Ambulatory care clinics**  Its NOT just rare conditions. Dx errors are COMMON in patients with anemia, asthma, COPD

**CRICO** - Analysis of 4519 claims related to diagnostic error
Why do they happen?

100 cases – 535 root causes
Graber et al. Arch Int Med 165:1493-9, 2005

- BLUNT end
- SHARP end

SYSTEM

Communication, coordination, training, policies, procedures

Cognitive

Patient’s Clinical Course
Safer Dx Framework for Measurement & Reduction

Sociotechnical Work System*

Diagnostic Process Dimensions
- Patient-provider encounter & initial diagnostic assessment
- Diagnostic test performance & interpretation
- Follow-up and tracking of diagnostic information
- Subspecialty consultation/referral issues

Changes in policy and practice to reduce preventable harm from missed, delayed, wrong or over diagnosis

Patient

Measurement of diagnostic errors
- Reliable
- Valid
- Retrospective
- Prospective

Safer Diagnosis
- Collective mindfulness
- Organizational learning
- Improved calibration
- Better measurement tools and definitions

Feedback for improvement

Improved value of health care

Improved Patient Outcomes

* Includes 8 technological and non-technological dimensions

Singh & Sittig BMJQS 2015
Measuring Diagnostic Errors

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THE DIAGNOSTIC PROCESS

TIME

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Patient Engages with Health Care System

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The explanation of the health problem that is communicated to the patient

Treatment
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