MEASUREMENT OF DIAGNOSTIC ERRORS IS THE FIRST STEP TO IMPROVEMENT

HARDEEP SINGH, MD, MPH
HOUSTON VA CENTER FOR INNOVATIONS IN QUALITY, EFFECTIVENESS & SAFETY
MICHAEL E. DEBAKEY VA MEDICAL CENTER
BAYLOR COLLEGE OF MEDICINE
Twitter: @HardeepSinghMD
Current Landscape & Why Little Progress

- “Basic Science” at the confluence of cognitive science, informatics, human factors, social science, & the ‘art’ of medicine

- Experts still debating definition of “diagnosis”
  - lack of standards for most “diagnosis” concepts

- Operational definitions of diagnostic error harder & especially with evolving diagnosis
  - Uncertainty at play; not always black & white

Singh H Jt Comm J Qual Saf 2014; Zwaan & Singh Diagnosis 2015
Safer Dx Measurement Framework

Sociotechnical Work System*

Sociotechnical Work System*

Diagnosis Process Dimensions

Patient-provider encounter & initial diagnostic assessment

Diagnostic test performance & interpretation

Follow-up and tracking of diagnostic information

Subspecialty consultation/referral issues

Patient

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

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

• Collective mindfulness
• Organizational learning
• Improved calibration
• Better measurement tools and definitions

Safer Diagnosis

Feedback for improvement

Improved value of health care

Improved Patient Outcomes

* Includes 8 technological and non-technological dimensions

Singh & Sittig BMJQS 2015
Time Ripe for Retrospective Measurements

- Signals from administrative data are weaker
  - If validated, could provide clues on possible missed opportunities that warrant additional clinical evaluation

- Stronger signals to bolster error measurement
  - Review high-risk cohorts (cancer ~ 1/3rd delays)
  - Triggered record reviews (e.g. unexpected hospitalization post PCP/ED visit)
  - Reports from providers or patients

Singh et al Am J Gastro 2009; Singh et al JCO 2010 Singh et al Arch IM 2012 Singh et al BMJQS 2011 Singh et al JAMA IM 2012; Singh and Sittig BMJQS 2015; Singh et al Peds 2010
Approach Diagnostic “Error” as Diagnostic “Safety”

Measures to Improve Diagnostic Safety in Clinical Practice

Hardeep Singh, MD, MPH,* Mark L. Graber, MD,†‡§ and Timothy P. Hofer, MD, MSc∥¶

TABLE 1. Candidate Set of Measurement Concepts to Consider for Evaluation of Diagnostic Safety

<table>
<thead>
<tr>
<th>Measurement Concept</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>80% of diagnostic errors in one study had no documented differential diagnosis.²⁶</td>
</tr>
<tr>
<td>Web-based decision support tools and online reference materials are available to all providers to aid differential diagnosis.</td>
<td>80% of diagnostic errors in one study had no documented differential diagnosis.²⁶</td>
</tr>
<tr>
<td>Process</td>
<td>Delays in diagnostic testing lead to delays in diagnosis and increased chances for iatrogenic injury in the interim.⁴¹</td>
</tr>
<tr>
<td>Proportion of laboratory test results or diagnostic imaging not performed within the expected turnaround time</td>
<td>Delays in diagnostic testing lead to delays in diagnosis and increased chances for iatrogenic injury in the interim.⁴¹</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Nearly a third of patients with colorectal cancer have missed opportunities for an earlier diagnosis.⁴⁸,⁵¹–⁵³</td>
</tr>
<tr>
<td>Proportion of patients with newly diagnosed colorectal cancer diagnosed within 60 days of first presentation of known red-flags</td>
<td>Nearly a third of patients with colorectal cancer have missed opportunities for an earlier diagnosis.⁴⁸,⁵¹–⁵³</td>
</tr>
</tbody>
</table>
Being Realistic About Future Progress

- Measurement ready for QI, learning & research purpose but not for public reporting, performance measurement or penalties
- Push ‘basic science’ ahead in next 10 years
  - Engage providers & patients
  - Health care organizations must step up efforts
  - Good data, standards and operational definitions
  - Measurement ---> feedback & learning

Singh & Sittig BMJQS 2015
Thank you and Acknowledgements

- Funding Agencies:
  - Department of Veterans Affairs
  - Agency for Healthcare Research & Quality
  - National Institute of Health

- Multidisciplinary team at VA Health Services Research Center for Innovation

Email: Hardeeps@bcm.edu
Web: http://www.houston.hsrdr.research.va.gov/bios/singh.asp
Twitter: @HardeepSinghMD