IMPROVING DIAGNOSIS & REDUCING DIAGNOSTIC ERRORS: AN EMERGING NATIONAL PATIENT SAFETY PRIORITY

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Most Americans will get a wrong or late diagnosis at least once in their lives

By Lena H. Sun  September 22

Most Americans who go to the doctor will get a diagnosis that is wrong or late at least once in their lives, sometimes with terrible consequences, according to a report released Tuesday by an independent panel of medical experts.

This critical type of health-care error is far more common than medication mistakes or surgery on the wrong patient or body part. But until now, diagnostic errors have been a relatively understudied and unmeasured area of patient safety. Much of patient safety is focused on errors in hospitals, not mistakes in diagnoses that take place in doctors’ offices, surgical centers and other outpatient facilities.

The new report by the Institute of Medicine, the health arm of the National Academy of Sciences, outlines a system-wide problem. The report's authors say they don't know how many diagnostic errors take place. But the report cited one estimate that such errors affect at least 12 million adults each year, or about 5 percent of adults who seek outpatient care.
Objectives

- High-level overview of diagnostic errors
- Next steps for improving safety and reliability of diagnosis
Early Work

- Evaluated evidence of ‘errors’ in integrated system
- Detailed review of comprehensive EHR to evaluate diagnostic process in the patient’s journey across the continuum of care
  - Data available from primary care, specialty (secondary) care, ER, hospital, diagnostics (lab/imaging/pathology), procedures
High Level Findings

- Common conditions missed in outpatient settings despite clear red-flags (5% or 1 in 20 US Adults/year)
- About half had potential for clear harm
- 7-8% of abnormal test results with lack of timely follow-up
The Battle Against Misdiagnosis

American doctors make the wrong call more than 12 million times a year.

By HARDEEP SINGH

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There are times when a single, unexpected death sparks a change in medical practice. In 2012 a 12-year-old boy named Rory Staunton died after being misdiagnosed in a New York City emergency room. Multiple physicians missed the symptoms, signs and lab results pointing to a streptococcal bacterial infection that led to septic shock and overwhelmed Rory's body. This tragic story led to the introduction of "Rory's rules," a set of practices to prevent similar incidents in hospitals.

Comparable initiatives have been introduced at the state level—but there might be room for improvement.

New research my colleagues and I conducted shows the extent of misdiagnosis among outpatient care seeking in the adult population. Each year, at least one in every 20 adults who seeks medical care in a U.S. emergency room or community health clinic may walk away with the wrong diagnosis, according to a new analysis that estimates that 12 million Americans a year could be affected by such errors.

Of those misdiagnosis mistakes, about 6 million could potentially cause harm, according to patient safety expert Dr. Hardeep Singh, who is the first to provide robust population-level data on the impact of the problem in outpatient settings.

That means patients with conditions as varied as heart failure, pneumonia, anemia and diabetes may frequently receive care that falls short of what they need to achieve true health and well-being. The result may be an overcrowded emergency department, chronic conditions and possible death.
Why Has it Taken So Long…..

We cannot improve what we cannot measure!

We cannot measure what we cannot define!
IOM 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.
How We Operationalized Definitions

- Case analysis reveals evidence of a missed opportunity to make a correct or timely diagnosis

- Missed opportunity is framed within the context of an “evolving” diagnostic process

- The opportunity could be missed by the provider, care team, system, and/or patient
Defining Preventable Diagnostic Harm

Missed opportunities in diagnosis due to system and/or cognitive factors

Preventable diagnostic harm

Delayed/wrong diagnosis associated with patient harm but no clear evidence of missed opportunities

Delayed/wrong diagnosis but no clear evidence of missed opportunities

Adapted from Singh Jt Comm J Qual Patient Saf 2014
The diagnostic process involves more than just what’s in the doctors head

Five “process” dimensions of diagnosis
Patient-Provider Encounter

- Problems with history, physical exam or ordering diagnostic tests for further work-up
Doctors at a Northern California hospital, concerned that a 40-year-old woman with sky-high blood pressure and confusion might have a blood clot, order a CT scan of her lungs. To their surprise, the scan reveals not a clot but large cancers in both breasts that have spread throughout her body. Had they done a simple physical exam of the woman’s chest, they would have been able to feel the tumors. So would the doctors who saw her during several hospitalizations over the previous two years, when the cancer might have been more easily treated.

A middle-aged man admitted to a Seattle emergency room for the third time in six weeks displays the classic signs of liver cirrhosis for which he has been repeatedly treated, including swollen legs and a distended abdomen. But a veteran doctor spots a telltale indicator of a different disease: rapid inward pulsations just beneath the man’s right ear. The patient’s problem is not his liver but his heart: he has constrictive pericarditis, a serious condition that requires surgery.
Diagnostic Tests: Lab/Path/Imaging

- Problems with ordered tests either not performed or performed/interpreted incorrectly
Follow-up and Tracking

- Problems with follow-up of abnormal diagnostic test results or scheduling of follow-up visits
If you think your doctor will automatically tell you if you have an abnormal test result, think again. Researchers studying office procedures among primary care physicians found evidence that more than 7 percent of clinically significant findings were never reported to the patient.

The scientists, led by Dr. Lawrence P. Casalino, an associate professor at Weill Cornell Medical College, reviewed the records of 5,434 patients at 19 independent primary care practices and four based in academic medical centers. They extracted records that contained abnormal results for blood tests or X-rays and other imaging studies, and then searched for documentation that the patient had been properly informed of the problem in a timely way.

Then they surveyed the doctors with uninformed patients. Some told them that the patient had been informed, even though there was no documentation, while
Referrals/Specialty Consultations

- Lack of appropriate actions on requested consultation or
- Communication breakdown from consultant to referring provider

Gandhi et al JGIM 2000
Patient Behaviors/Adherence
Research Reveals Lots to Fix!

- Failure to elicit key history or exam finding
- Complex systems and cognitive issues involved
  - Not black and white
  - Tension b/w under-diagnosis and over-aggressive diagnostic pursuits
  - Chaotic clinical settings & inadequate time
- Overlooking critical information in EHRs
- Lack of feedback systems for improvement

Meyer et al JAMA IM 2013; Singh et al JAMA IM 2013; Sarkar et al BMJQS 2012
No Single Fix but Many Avenues….

- Measurement
- System Strengthening/Safety Culture
- Communication and Teamwork
- Technology
- Cognitive support/interventions
- Patient Empowerment
Lessons in Health IT

- Our goals are to use health IT to improve diagnosis, reduce errors and harm, but..

- Current Reality: Trying to ensure health IT itself is being used ‘safely’

Divvy K. Upadhyay, Dean F. Sittig and Hardeep Singh*

Ebola US Patient Zero: lessons on misdiagnosis and effective use of electronic health records

Abstract: On September 30th, 2014, the Centers for Disease Control and Prevention (CDC) confirmed the first travel-associated case of US Ebola in Dallas, TX. This case exposed two of the greatest concerns in patient safety in the US outpatient health care system: misdiagnosis and ineffective use of electronic health records (EHRs). The case received widespread media attention highlighting failures in disaster management, infectious disease control, national security, and emergency department (ED) care. In addition, an error in making a correct and timely Ebola diagnosis on initial ED presentation brought diagnostic decision-making vulnerabilities in the EHR era into non-technical factors will be needed. Ebola US Patient Zero reminds us that in certain cases, a single misdiagnosis can have widespread and costly implications for public health.

Keywords: cognition; decision-making; diagnostic error; Ebola; electronic medical records; health information technology; human factors; misdiagnosis; patient safety.

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Lessons in Communication

- Our goals are to improve communication but ....

- Current Reality: Breakdowns continue to occur

An Infection, Unnoticed, Turns Unstoppable

By JIM DWYER  Published: July 11, 2012

For a moment, an emergency room doctor stepped away from the scrum of people working on Rory Staunton, 12, and spoke to his parents.

“Your son is seriously ill,” the doctor said.

“How seriously?” Rory’s mother, Orlaith Staunton, asked.

The doctor paused.

“Gravely ill,” he said.

How could that be?

Two days earlier, diving for a basketball at his school gym, Rory had cut his arm. He arrived at his pediatrician’s office the next day, Thursday, March 29, vomiting, feverish and with pain in his leg. He was sent to the emergency room at NYU Langone Medical Center. The doctors agreed: He was suffering from an upset stomach and dehydration. He was given fluids, told to take Tylenol, and sent home.

Partially camouflaged by ordinary childhood woes, Rory’s condition was, in fact, already dire. Bacteria had gotten into his blood, probably through the cut on his arm. He was sliding into a septic crisis, an avalanche of immune responses to infection from which he would not escape. On April 1, three nights after he was sent home from the emergency room, he died in the intensive care unit. The cause was severe septic shock brought on by the infection, hospital records say.
Where to begin in the diagnostic process?
Making Diagnosis Reliable

Plenty of evidence suggests that time is ripe for interventions to improve diagnostic testing & follow-up.

Must consider the context of testing in the EHR-enabled health system.

Singh et al System Interventions BMJQS 2010
Take Away Points

- Missed/delayed diagnosis are common safety problems
- Challenging issue to tackle due to complex cognitive and systems issues
- Measurement & improvement of test results follow-up a first step
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