Zebras or Horses: Reducing the Risk of Diagnostic Errors

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“We have not lost faith but we have transferred from God to the medical profession”

George Bernard Shaw

Overview

Diagnostic errors are still common occurrences. Whether triggered by system issues or cognitive challenges, physicians walk a daily diagnostic tightrope of potential misses. Such errors can result in substantial patient harm. This seminar, supported by case studies and diagnostic error data, will review events that result in diagnostic error and provide prevention strategies.
OBJECTIVES

After completing this activity, learners will be able to:

- Recall the common diagnostic processes and events that result in errors
- Explain how human factors hinder diagnostic abilities
- Identify two strategies to reduce the potential for error in both initial diagnoses and in postoperative cases

Diagnosis Is

“The most critical of a physician’s skills. It is every doctor’s measure of his abilities. It is the most important ingredient in his professional self-image.”

-- Dr. Sherwin B. Nuland 1994 in “How we Die”
A Renewed Spotlight

- Highlighted the importance of the diagnostic error issue
- Noted under-appreciation of diagnostic error can be related to:
  1. Sparse data on diagnostic error
  2. Few reliable measures of tracking it
  3. Often error identified only in retrospect
- Fundamental is the idea that diagnosis involves a collaborative process involving a dynamic team of professionals, as well as the patient who is central to the solution and family members.


Definition

What is Diagnostic Error?

- The Institute of Medicine defined diagnostic error as 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.

Simply put, these are diagnoses that are missed altogether, wrong, or should have been made much earlier.

Categories of Diagnostic Error

- **Missed**
  - Medical complaints are never explained

- **Wrong**
  - The original diagnosis is found to be incorrect because the true cause is discovered later

- **Delayed**
  - Case where the diagnosis should have been made earlier

Source: Institute for Healthcare Improvement

Causes of Diagnostic Error

1. Diagnostic process complexity
2. Complexity of health care delivery
3. Cognitive errors

Source: Society to Improve Diagnosis in Medicine
<table>
<thead>
<tr>
<th></th>
<th>Diagnostic Error Myths</th>
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<tbody>
<tr>
<td>10.</td>
<td>I have a reliable system in place to track requested tests</td>
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<tr>
<td>9.</td>
<td>I speak personally with the radiologist and pathologist about important tests</td>
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<td>8.</td>
<td>If I made a diagnostic error, I’d find out about it</td>
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<td>7.</td>
<td>I always make a complete differential diagnosis</td>
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<td>6.</td>
<td>Most diagnostic errors involve rare or uncommon diseases</td>
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<td>5.</td>
<td>I’m a good listener</td>
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<td>4.</td>
<td>I communicate effectively with my patients</td>
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<td>3.</td>
<td>Physicians know what they know and what they don’t know</td>
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<tr>
<td>2.</td>
<td>I can trust my intuition</td>
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<tr>
<td>1.</td>
<td>It won’t happen to me</td>
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Source: Society to Improve Diagnosis in Medicine

**Why?**

**Statistics**

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**THEDOCTORS COMPANY**
Frequency: Diagnostic Error

- One in 20 U.S. adult outpatients misdiagnosed
- 5% of the U.S. population or 12 million annually
- One half of errors have the potential to lead to severe harm
- Failure to gather information
  - 15-minute visit
    - History
    - Physical examination
    - Chart review


Frequency: Leading Cause in Malpractice Claims

- CRICO/RMF
- Agency for Healthcare Research and Quality (AHRQ)
- JAMA 2009: Diagnostic Errors–The Next Frontier for Patient Safety
- Pediatrics 2008
- Annals of Internal Medicine 2006: Ambulatory Settings
Recent Studies

- Leading cause of malpractice claims
  - CRICO 20%
  - PIAA death cases 27%
  - NPDB 29%
- Autopsy diagnostic discrepancies
  - Agency for Healthcare Research & Quality 10-20%
- Patient & Physician surveys
  - Patient concerns 55%
  - Physicians self report monthly errors 50%

Who’s at Risk: CRICO

CRICO/RMF Data

- Over 23,500 claims from 2008 – 2012
- 20% of the allegations indicating diagnostic failure (4700 claims)
- Almost 2700 claims or 57% were ambulatory diagnostic error
- 49% were from the internal medicine and family medicine specialties
Who's at Risk?

While surgery-related allegations account for the greatest number of cases, diagnosis-related allegations account for the highest total incurred.

Allegation categorizes claims and suits by their case type.

Who's at Risk: The Doctors Company

(continued)

7,438 closed claims were reviewed

- 61% Pediatric (88 of 144 claims)
- 58% Emergency Medicine (242 of 414 claims)
- 40% Internal Medicine (374 of 986 claims)
- 37% Family Medicine (417 of 1134 claims)
- 26% Cardiology (114 of 447 claims)
- 15% Gynecology (98 of 674 claims)
- 13% Orthopedic (215 of 1647 claims)
- 9% Obstetrics (68 of 757 claims)

52% of diagnosis found in different specialties

Breast, Colon, Lung CA

Acute MI

Acute CVA

2007 – 2013 The Doctors Company
Who’s at Risk: PIAA
(Formerly Physician Insurers Association of America)

- **Internal Medicine**
  - Most *prevalent* condition for errors in diagnosis
    - Malignant neoplasms of the bronchus and lung
  - Most *expensive* condition for errors in diagnosis
    - Chest pain
- **General and Family Practice**
  - Most *prevalent* condition for errors in diagnosis
    - Acute myocardial infarction


Both System and Human Issues

- Diagnostic process is a complex system
- Multiple providers are involved
- System(s) is/are poorly designed
- Human factors

Commonly Misdiagnosed/Mismanaged Conditions

- Opioid prescribing*
- Cancer related issues
- Surgery (wrong site-patient/retained objects)*
- Response to surgical complications
- Use of non-FDA approved meds/devices*
- Neurological related issues**
- Cardiac related issues**
- Urological related issues

* = Board of Osteopathic Medicine
** = Board of Medicine


Diagnostic Error

Missed and Delayed Diagnosis in the Ambulatory Setting

- Process failure
  - Ordering 55%
  - History/exam 42%
  - Follow-up 45%
- Care coordination failure
  - Referral consultation delays
  - Inadequate coordination
  - Lack of teamwork

Contributing Factors

Atypical Presentation 75%
Failure to consider other diagnoses 50%
Inadequate patient history 40%
Inadequate follow-up 29%
Failure to account for a symptom 22%

Contributing Factors

Failure to order tests 21%
Inadequate examination 16%
Failure to refer 13%
Incorrect interpretation of diagnostics 10%
Understanding the Risks Associated with Diagnosis

Diagnostic Decision Making

Clinical judgment uses a dual-process reasoning model

System 1—heuristic and intuitive clinical decisions
- Experience determines interpretation of data
- Pattern recognition processing—a shortcut

System 2—systemic and analytical clinical decisions
- Used for unrecognized patterns or problems
- Deliberate and comprehensive review of the case
Error-Producing Conditions

- Suboptimal Environments
- Emotional Reactions
- Communication Issues
- Patient-Related Factors
- Diagnostic Error

Cognitive Pitfalls

- Anchoring error
  - Seizing on the initial symptom and making a snap judgment
- Attribution error
  - Emotional reaction
- Availability error
  - Similar patients had similar complaints and diagnosis is the first one that comes to mind
- Confirmation bias
  - Seek confirming data; disregard conflicting data
Cognitive Pitfalls

- Premature closure
  - Narrow diagnostic focus, too early closure
- Context errors
  - Biased by previous history or diagnosis

Problems in Identifying Diagnostic Errors

- Evaluation of a case with knowledge of the patient's outcome (hindsight bias)
- Lack of a gold standard for diagnosis
- Individual blame vs system failures
- Multiple factors
Hindsight Does Not Equal Foresight

Knowledge of outcome biases our judgment about the processes that led up to that outcome

Hindsight Bias

- Evaluation of a case with knowledge of the patient’s outcome
  - Radiologist who presents with shortness of breath
  - Interprets his own x-ray as “consistent with pneumonia”
  - Later dies of MI and pulmonary edema
  - Several radiologists review x-ray knowing outcome
    - Their consensus - “Consistent with pulmonary edema”

Traditional Review vs. Systems Review

- Patient safety review

  Not focusing on individual blame or the culpable individuals as the courts do

  Instead, analyze the systems in which the failures occurred—multi-factoral

  Today’s approach: Macro view of the diagnostic system with an understanding of where the failures lie

Case Studies
Case Study 1:
Failure to Reconcile Symptoms with Diagnosis

80 year-old with history of elevated PSA/bx. Aggressive cancer found

Insured ordered bone scan and MRI; radiologist interpreted scan as consistent with osseous metastasis; MRI showed no evidence of metastasis

Insured advised the patient that MRI was the gold standard; told patient findings of bone scan but no clinical correlation
Case Study 1: Misinterpretation of Bone Scan Findings

(continued)

- Patient was treated with Lupron, beam radiation and seeds implant
- Continued jaw pain so patient saw 2 dentists, 1 oral surgeon; diagnosed cancer of the mandible
- Patient was referred to radiation oncologist; treated but developed cancer of spine
- Patient expired

Risk Issues

- Narrow diagnostic focus
- Failure to reconcile symptoms with imaging results
- Lack of communication among all providers and patient
Case Study 1: Misinterpretation of Bone Scan Findings

(continued)

Legal Analysis

- Issues of concern in defending care
- Would defendant be vulnerable

Case Study 2: Failure/Delay Ordering Diagnostic Tests
Case Study 2: Failure/Delay in Ordering Tests

- 72 year-old male with history of smoking, alcoholism, diabetes, hypertension
- To ER and diagnosed with UTI with hematuria; recommended f/u with urologist
- Insured performed cystoscopy and CT; impression BPH; 24 hour urine evaluation for protein and check creatinine; all WNL. UTI resolved
- 3 months later to ER for hematuria and retention. Catheter placed and referred to urologist who recommended laser treatment for obstruction; patient refused preferring to continue with Flomax; catheter removed & cystoscopy noted no tumors
- 3 months later after TKR again hematuria and now c/o fatigue
- To PCP for fatigue and requesting a different urologist because first urologist “did not answer questions”

(continued)

- New urologist performed cystoscopy and found bladder neck cancer-high grade transitional cell carcinoma with infiltration of muscle
- Radical cystectomy with ileo-conduit diversion and removal lymph nodes; chemotherapy & radiation
- Aspiration pneumonia then diagnosed with colon cancer and had colectomy
Case Study 2: Failure/Delay in Ordering Tests

Risk Issues

- Narrow diagnostic focus; failure to establish differential diagnosis
- Failure to repeat testing including cystoscopy with recurring symptoms
- Failure to establish rapport with patient and provide answers to questions
- Coordination of care between urologist & PCP

Legal Analysis

- Allegation: delay in diagnosing bladder cancer
- Defense experts mixed in evaluation of care
- Defense strategy
Case Study 3: Inadequate Assessment

- Elderly female with ongoing back pain; epidural performed with no relief and aggravated back pain
- Admitted next day; MRI normal; confusion attributed to narcotics
- Elevated sedimentation rate with no f/u and not included in differential diagnosis
- Had blood cultures but negative; still no improvement
- Insured initially consulted orthopedics but canceled and instead consulted rehab. No documentation on rationale for consult switch
- Lack of improvement with rehab; consulted neuro surgeon who repeated the MRI which showed spinal abscesses. WBC 30,000. Developed leg twitching and incontinence
Case Study 3: Inadequate Assessment

(continued)

- To OR for drainage abscesses and also abscess psoas muscle, additionally decompression laminectomy with removal extruded fragment (surgery 11 days after initial admission)
- Hospitalized 60 days more then patient transferred to assisted living facility
- Developed chest pain and was readmitted with bacterial endocarditis and expired

(continued)

Risk Issues

- Failure to appreciate and reconcile relevant signs and symptoms
- Delay in ordering tests
- Insufficient documentation affecting test/f/u; appears poor system
- Poor rapport with family felt insured unsympathetic
Case Study 3: Inadequate Assessment

Legal Analysis
- Issues in defending claim
- Effect of poor rapport with family
- Faulty systems for follow-up

Case Study 4: Narrow Diagnostic Focus
Case Study 4: Narrow Diagnostic Focus

- Insured FP saw 32 year-old obese patient. Chief complaints: gastric ulcers and migraines. History of GI bleed, Hepatitis C; prior cholecystectomy & EGD
- Seen by CNP and diagnosed with chronic hepatitis C, fibromyalgia & migraines; prescribed Cymbalta, Tramadol and Darvocet
- Patient returned to CNP within 30 days with vertigo, depression & fungal dermatitis. Prescriptions given for Diazepam, Econazole & Prozac
- Treated 3 months later for continued headaches & fibromyalgia
- Seen 6 months later for heavy menses & cramping abdominal pain; again saw CNP who examined anus & rectum-negative for masses or hemorrhoids/fissures-neg. family history for colon cancer

(continued)

- Seen six months later for a four day period of fever and abdominal pain. Additionally bright red rectal blood, anorexia, dehydration, straining to defecate; recent Clindamycin for MRSA; CNP orders Flagyl, Lomotil, & Percocet; suggests consideration of colonoscopy if labs yield no specific findings; positive for C diff
- Continued symptoms for rectal bleeding and abdominal pain but somewhat improved-continued with antibiotics
- Three weeks later had hysterectomy with post-op UTI & return of C diff.; return of abdominal discomfort and rectal bleeding-CNP suggests avoiding dairy & taking probiotics
- Continued symptoms over next year: finally referred to GI specialist for colonoscopy-cancer of sigmoid, stage IIIA; treated with resection of colon & chemo
Case Study 4: Narrow Diagnostic Focus

Risk Issues

- Failure to meet standard of care with no examination by physician all care rendered by CNP; lack of supervision
- Too narrow diagnostic focus with failure to establish differential diagnosis
- Failure to obtain timely consultation

Legal Analysis

- Impact of lack of supervision
- Does lack of physician involvement with Advance Practice Provider place all liability on physician?
- Does the gynecologist treating and performing hysterectomy have any impact on responsibility of outcome?
Case 5: Failure to Recognize & Reconcile Signs/Symptoms

- 59 year-old obese smoker (280 lbs) with history of kidney cancer; to ER following MVA 6 years later; chest x-ray vaguely nodular densities left lower lung/CT of chest would be of value: ER physician told patient something on x-ray f/u with PCP

- Saw PCP few days later and advised not to worry only shadow. Medical record documentation all x-rays negative

- Followed in office next 3 years with complaints including back pain & cough; continued symptoms and MRI performed revealing lung mass-biopsied and treated but patient expired 7 months after MRI

- Issue of late entries in chart by doctor & LPN stating patient refused CT
Case 5: Failure to Recognize & Reconcile Signs/Symptoms

(continued)

**Risk Issues**
- Failure to adequately address & reconcile signs and symptoms
- Failure to review all medical record results
- Too narrow diagnostic focus
- Inadequate communication among providers
- Possible altered record and no documentation about how doctor responded to refusal of diagnostic testing

Legal Analysis
- Impact of possible alteration of record
- Lack of effective communication among providers
- Does ER physician or radiologist have any responsibility to f/u with PCP on abnormal finding?
Patient Safety Strategies

Physician Strategies

- Be reflective. Take a diagnostic ‘time out.’
- Listen to your patients and their caregivers.
- Learn the causes of diagnostic error and how to avoid pitfalls.
- Don’t trust your intuition — always construct a differential diagnosis.
- Take advantage of second opinions.

Source: Society to Improve Diagnosis in Medicine
**Physician Strategies**

- Use diagnosis-specific decision support resources: Software or simple checklists
- Make the patient your partner in diagnosis.
- Ensure all ordered diagnostic tests and consults are completed.
- Speak directly with the staff providing you with diagnostic test results (i.e. radiologists).
- Empower your colleagues to let you know if they become aware that a diagnosis you made has changed.

Source: Society to Improve Diagnosis in Medicine

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**Prevention**

**Routines and Practice Standards**
- Document all encounters
- Develop plan of care and document it

**Involve the Patient and Family**
- Open transparent communication
- Address language barriers, hearing impaired and illiteracy
- Give clear written follow up instructions and ask for “Repeat back”

**Determine who is coordinating care**
- If PCP – all tests/consults tracked back to you
- If Consultant – know who ordered the consult and if report should go back immediately to referring provider
Mitigation

Disclosure

Patient Safety Tips

- Facts
- Review/analysis pending
  - When will results be available
- Is patient aware of a problem
- If known risk/complication, say so
- If confirmed error was made, say so
Remember. . . . . . .

They Trust In You
Resources

- Agency for Healthcare Research and Quality (AHRQ)
  www.guidelines.gov
- www.nationalacademies.org for the Improving Diagnosis in Healthcare report
- CRICO 2014 benchmarking report Malpractice Risks in the Diagnostic Process
  www/rmf/harvard.edu

THANK YOU

We relentlessly defend, protect, and reward the practice of good medicine.