Annual Educational Conference

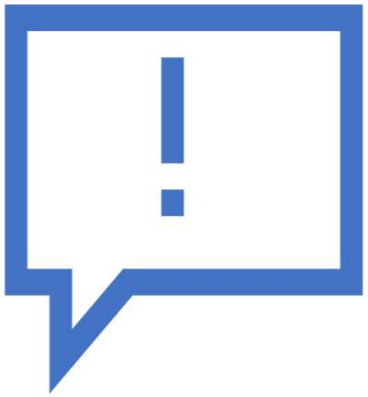
June 4, 2021



Managing Risks Related to Diagnostic Decision Making

Ann D. Gaffey, RN, MSN, CPHRM, DFASHRM

Objectives

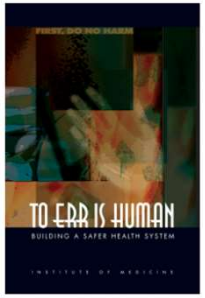


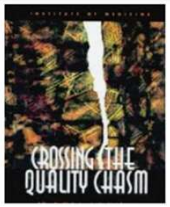
1. Participants will be able to describe the three most significant misdiagnosis-related professional liability claims.
2. Participants will be able to discuss three risk mitigation strategies to improve diagnostic quality and safety.
3. Participants will be able to apply one quality improvement method to evaluate potential causes of diagnostic error events that contribute to patient harm.

Inaccurate or delayed diagnosis is one of the most important safety problems in healthcare today and inflicts the most harm.

What is "Diagnostic Error"?

- The failure to:
  - establish an accurate and timely explanation of the patient's health problem(s); or
  - communicate that explanation to the patient.







National Academies of Sciences, Engineering, and Medicine 2015. Improving Diagnosis in Health Care. Washington, DC: The National Academies Press. https://doi.org/10.17226/21794

Other Diagnostic Error Definitions

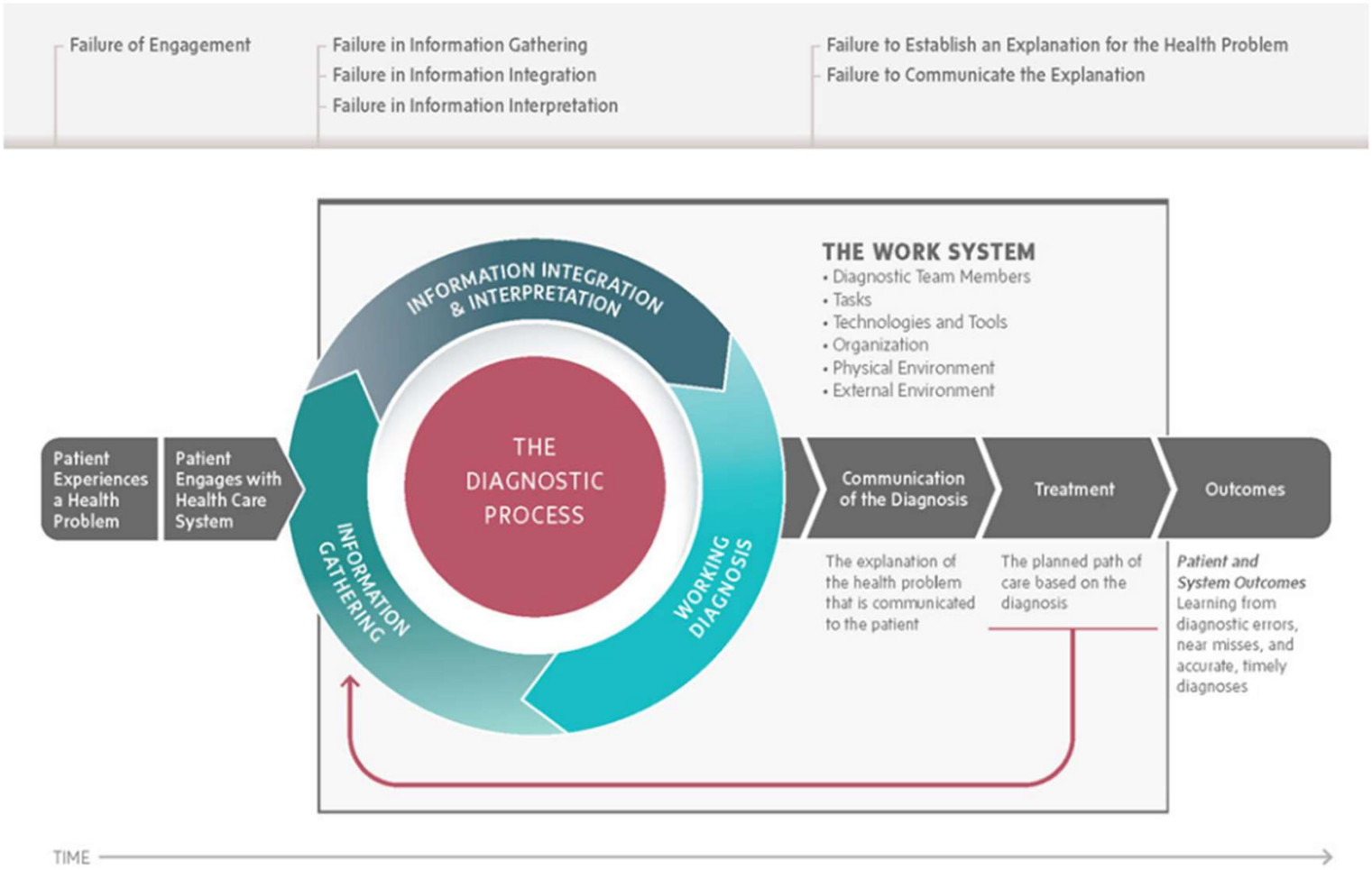
Missed Opportunity

…a failure to make a correct or timely diagnosis resulting from a preventable process failure (omission or commission), given the evolving context at the time, linked to the sociotechnical work system (adapted from Singh, 2014)

Misdiagnosis-related Harm

…harm resulting from the delay or failure to treat a condition actually present (when the working diagnosis was wrong or unknown) or from treatment provided for a condition not actually present. (adapted from Newman-Toker, 2009)

FIGURE 2. Places in the diagnostic process where errors can occur



Source: National Academies of Sciences, Engineering, and Medicine. 2015. Improving Diagnosis in Health Care. Washington, DC: The National Academies Press

How significant is this problem in health care?

- Patient Impact
- Business Impact
- Malpractice Impact

Patient Impact

- Diagnostic errors represent a major public health problem likely to affect every one of us at least once in our lifetime, sometimes with devastating consequences.
- At a minimum, wrong or delayed diagnoses cause more serious harms to patients than any other type of medical error
- 40,000-80,000 people die each year from diagnostic failures in U.S. hospitals alone.
- Diagnostic errors affect more than 12 million Americans each year and may seriously harm one-third of these patients, likely dwarfing all other causes of harm from medical errors combined.

The most common cause of medical errors reported by patients

Source: National Academies of Sciences, Engineering, and Medicine. 2015. Improving Diagnosis in Health Care. Washington, DC: The National Academies Press

Open Notes

(www.opennotes.org)

JAMA Network Open: Frequency and Types of Patient-Reported Errors in Electronic Health Record Ambulatory Care Notes, June 2020

- 29,656 respondents, and 1 in 5 patients who read a note reported finding a mistake and 40% perceived the mistake as serious. Among patient-reported very serious errors, the most common characterizations were mistakes in diagnoses, medical history, medications, physical examination, test results, notes on the wrong patient, and sidedness.

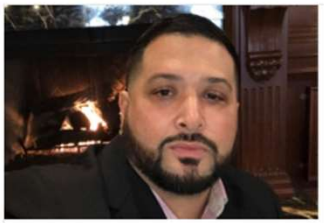
Table 3. Categories and Examples of Very Serious Mistakes Reported by Patients

Category	Mistakes, No. (%) (n = 356)[a]	Example of patient-reported mistake
Diagnosis mentioned	98 (27.5)	"The note said I was not BRCA1 when I am BRCA1...My provider, who was surprised, immediately corrected it." "The diagnosis for the visit was incorrect. Although I did receive a referral for physical therapy, it was for the wrong body part. This necessitated two more visits to the clinic...and a significant delay in the treatment of my injury." "It was stated in notes that I had lung cancer. I do not and never have had lung cancer. I did have a spontaneous pneumothorax in 1976, however."
Medical history	85 (23.9)	"Doctor reported that I did not claim to have pain in my hand. I am a pianist and I went specifically because pain was in my hand." "I have been complaining of difficulty breathing [for over 3 mo]. It has been a real and increasing problem for me, but is not mentioned in my notes...in fact, notes saying my breathing is normal, are made for each visit."
Medications or allergies	50 (14.0)	"Not listing my allergy that I have had anaphylaxis with before, prior to being in the operating room." "I found an incorrect dosage on a note that was being used by a referred physician for an infusion. The dosage was incorrect by 10-fold."
Tests, procedures, or results	30 (8.4)	"Pathology report summary stated I had 2 positive lymph nodes but detailed report stated 3 positive lymph nodes. That changes the staging and the treatment options. My physician had only read the summary and didn't realize I had 3 positive lymph nodes." "Was counseled to have an elective abortion for blighted ovum because the sac had reached 25 mm without fetal pole or yolk sac being visible on ultrasound. [I] compared [the] note to my ultrasound report [which] noted it was only 2.5 mm."
Physical examination	24 (6.7)	"The notes reflect exams not done in the exam room. As a medical profession I find this alarming"

Bell SK, Delbanco T, Elmore JG, et al. Frequency and Types of Patient-Reported Errors in Electronic Health Record Ambulatory Care Notes. *JAMA Netw Open.* 2020;3(6):e205867. doi:10.1001/jamanetworkopen.2020.5867

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Boise, ID

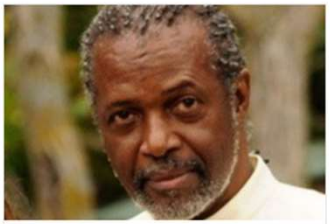
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Business Impact

- Improving the accuracy and timeliness of diagnoses will reduce costs from inappropriate testing, wrong treatments, and malpractice lawsuits, potentially saving over $100 billion per year. (NAM)

- In addition to causing physical harm, misdiagnosis also has a significant financial impact on the U.S. economy, individual patients, and businesses.
  - Another IOM report estimates that 30% of annual healthcare spending in the United States, approximately $750 billion, is wasted on unnecessary services and other inefficiencies.

Best Care at Lower Cost: The Path to Continuously Learning Health Care in America. Mark Smith, Robert Saunders, Leigh Stuckhardt, and J. Michael McGinnis, Editors. http://www.nap.edu/catalog/13444

Malpractice Impact

- Diagnostic errors—not surgical mistakes or medication overdoses—accounted for the largest fraction of malpractice claims, the most severe patient harm, and the highest total of penalty payouts.
- Of the 350,706 paid claims, diagnostic errors were the leading type (28.6 %) and accounted for the highest proportion of total payments (35.2 %).
- Diagnostic errors resulted in death or disability almost twice as often as other error categories.
- Diagnosis-related payments amounted to $38.8 billion between 1986 and 2010.

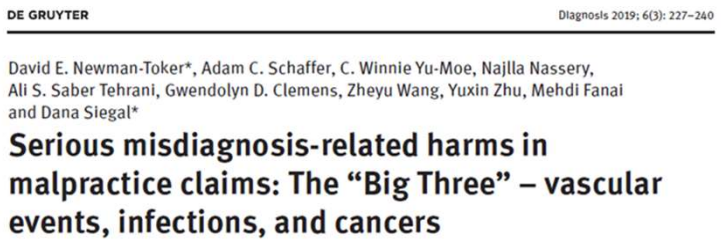
Ali S Saber Tehrani, HeeWon Lee, Simon C Mathews, Andrew Shore, Martin A Makary, Peter J Pronovost, David E Newman-Toker. 25-Year summary of US malpractice claims for diagnostic errors 1986–2010: an analysis from the National Practitioner Data Bank. *BMJ Qual Saf*, 22 April 2013 DOI: 10.1136/bmjqs-2012-001550

DIAGNOSTIC ERROR

Malpractice Claim Trends

Diagnostic Error Claim Trends

- ***Misdiagnosis-related harm*** is harm resulting from the **delay** or **failure** to treat a condition *actually present*, when the working diagnosis was wrong or unknown [delayed or missed diagnosis], or from treatment provided for a condition not actually present [wrong diagnosis].
- Data derived from CRICO claims database (2006-2015), representing about 28.7% of U.S. malpractice claims
  - 55,377 closed claims, analyzed 11,592 diagnostic error cases (21% of cases)
  - 74.1% of the high-severity cases (n = 7,379) involved the "Big Three."
- Cancers (37.8% of big three): **Lung**
- Vascular events (22.8% of big three): **Stroke**
- Infections (13.5% of big three): **Sepsis**


DE GRUYTER Diagnosis 2019; 6(3): 227–240

David E. Newman-Toker*, Adam C. Schaffer, C. Winnie Yu-Moe, Najilla Nassery, Ali S. Saber Tehrani, Gwendolyn D. Clemens, Zheyu Wang, Yuxin Zhu, Mehdi Fanai and Dana Siegal*

Serious misdiagnosis-related harms in malpractice claims: The "Big Three" – vascular events, infections, and cancers

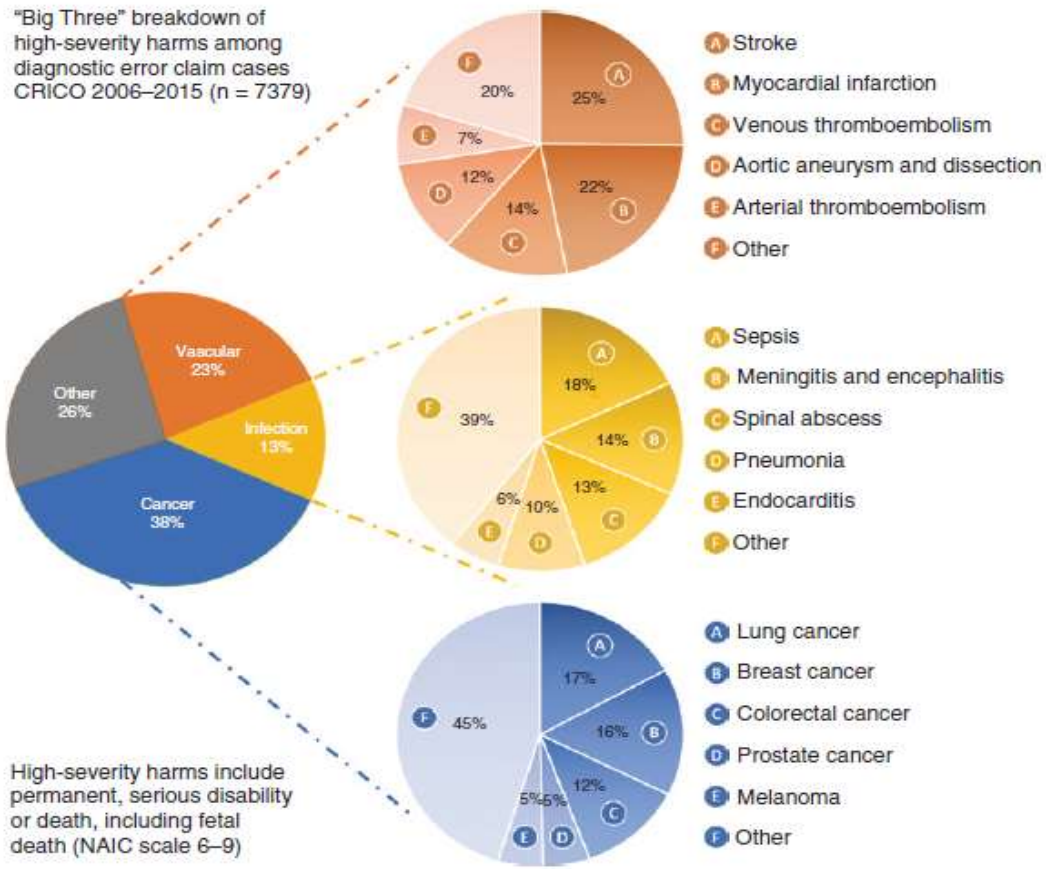


Figure 3: Big Three category and disease proportions for malpractice claim cases associated with serious misdiagnosis-related harms. The category-level pie chart (at left) reflects all 7379 high-severity claim cases, while the three disease-level pie charts (at right) show the top five diseases in each Big Three category. Together these 15 diseases account for 63.5% of Big Three cases and 47.1% of all high-severity cases. CRICO, Controlled Risk Insurance Company, Ltd. Comparative Benchmarking System; NAIC, National Association of Insurance Commissioners Severity of Injury Scale.

DE GRUYTER Diagnosis 2019; 6(3): 227–240

David E. Newman-Toker*, Adam C. Schaffer, C. Winnie Yu-Moe, Najlla Nassery, Ali S. Saber Tehrani, Gwendolyn D. Clemens, Zheyu Wang, Yuxin Zhu, Mehdi Fanai and Dana Siegal*

Serious misdiagnosis-related harms in malpractice claims: The "Big Three" – vascular events, infections, and cancers

- 71.2% (n = 5257/7379) of high-severity cases occurred in EDs or outpatient clinics
- High-severity cases from EDs and inpatient settings were disproportionately from vascular events and infections.

Table 2: Payments in high-severity harm malpractice claims by Big Three category and disease (n = 7379).

Big Three category and disease	Cases, n	Cases with paid[a] Claims, n (%[b])	Total payments, $	Mean per-claim payout (all), $	Mean per-claim payout (paid[a] only), $	Rank[c]
Vascular						
Stroke	424	168 (39.6%)	$134,278,886	$316,695	$799,279	#4
Myocardial infarction	367	172 (46.9%)	$120,050,269	$327,112	$697,967	#7
Venous thromboembolism	239	106 (44.4%)	$74,219,293	$310,541	$700,182	#6
Aortic aneurysm and dissection	191	91 (47.6%)	$58,621,501	$306,919	$644,192	#10
Arterial thromboembolism	123	58 (47.2%)	$32,543,403	$264,581	$561,093	#15
Other vascular	340	129 (37.9%)	$99,264,302	$291,954	$769,491	NA
All vascular	1684	724 (43.0%)	$518,977,654	$308,182	$716,820	NA
Infection						
Sepsis	179	65 (36.3%)	$51,408,008	$287,196	$790,892	#5
Meningitis and encephalitis	136	60 (44.1%)	$69,149,562	$508,453	$1,152,493	#2
Spinal abscess	131	66 (50.4%)	$95,674,011	$730,336	$1,449,606	#1
Pneumonia	97	33 (34.0%)	$29,108,022	$300,083	$882,061	#3
Endocarditis	57	21 (36.8%)	$12,580,534	$220,711	$599,073	#11
Other infection	392	156 (39.8%)	$144,053,537	$367,484	$923,420	NA
All infection	992	401 (40.4%)	$401,973,674	$405,215	$1,002,428	NA
Cancer						
Lung cancer	472	178 (37.7%)	$104,937,298	$222,325	$589,535	#12
Breast cancer	434	188 (43.3%)	$110,332,523	$254,222	$586,875	#13
Colorectal cancer	334	128 (38.3%)	$85,208,445	$255,115	$665,691	#9
Prostate cancer	147	71 (48.3%)	$41,365,887	$281,401	$582,618	#14
Melanoma	142	66 (46.5%)	$45,704,472	$321,862	$692,492	#8
Other cancer	1264	452 (35.8%)	$328,025,177	$259,514	$725,719	NA
All cancer	2793	1083 (38.8%)	$715,573,803	$256,203	$660,733	NA
Aggregate						
Big Three total	5469	2208 (40.4%)	$1,636,525,131	$299,237	$741,180	NA
Total "Top 5" for Big Three[d]	3473	1471 (42.4%)	$1,065,182,114	$306,704	$724,121	NA
Total of "Other" for Big Three[d]	1996	737 (36.9%)	$571,343,016	$286,244	$775,228	NA
Non-Big Three (all others)	1910	818 (42.8%)	$682,853,806	$357,515	$834,785	NA
Grand total	7379	3026 (41.0%)	$2,319,378,937	$314,322	$766,483	NA

[a]Paid refers to those cases with a non-zero indemnity payment compensating harms, whether this occurred through settlement, arbitration, or legal judgment. Unpaid claims are those with $0 indemnity payment, though there may still be an "expenses" payment associated with the claim (i.e. case management cost, including legal fees, which can be substantial, especially for cases going to trial and ending in a defense verdict). [b]Percentage represents the fraction of all claims for that row that were "paid" as per the definition listed in footnote "a". [c]Rank represents the rank order from the highest (#1) to the lowest (#15) by mean per-claim payment (paid claims only) for specific diseases. "Other" and total rows are not considered in the payment ranking. [d]The "Top 5" diseases represent the five most common from each Big Three category (vascular events, infections, and cancers). The "Other" diseases represent the aggregation of all other cases within that Big Three category. Together, "Top 5" and "Other" sum to the Big Three total. NA, not applicable.

CRICO 2018 CBS Benchmarking Report: Medical Malpractice in America – A Ten-Year Assessment with Insights

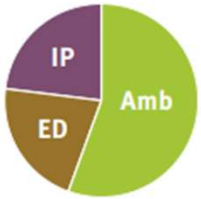
Diagnosis Cases

Among a wide range of missed or delayed diagnoses, cancers were consistently most prevalent.

FINAL DIAGNOSES IN MISSED/DELAYED DIAGNOSIS CASES

- **30% cancers**
  - top cancers
    - 16% breast
    - 14% lung
    - 10% colorectal
    - 7% uterine & ovarian
    - 6% skin
- 18% cardiac/stroke
- 17% complications of care
- 7% digestive system
- 7% nervous system
- other

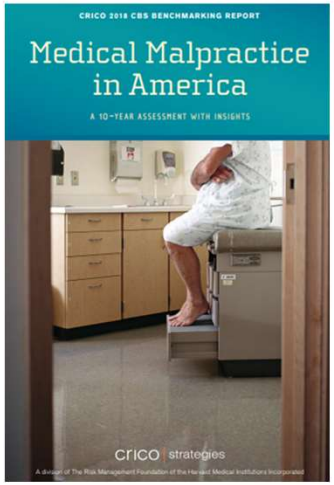
CARE SETTING



DIAGNOSIS CASES	
21%	of all cases
28%	of all losses
35%	closed with payment
$472K	average indemnity
$213K	median indemnity

ODDS RATIO FOR DIAGNOSIS CASES compared to non-diagnosis cases	
3.43	to involve a high-severity injury
1.16	to close with payment
1.72	to close with payment $1M+

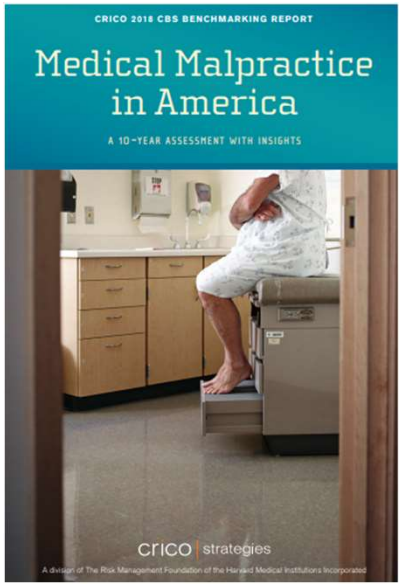
Care settings are Ambulatory, Inpatient, and Emergency Department



DIAGNOSTIC PROCESS OF CARE	% DIAGNOSIS CASES*
PHASE 1: INITIAL DIAGNOSTIC ASSESSMENT	
1. **Problem Noted, Care Sought** Access issues impede the patient from seeking care.	1%
2. **History and Physical Conducted** Patient's history is not updated; physical examination is absent or inadequate.	10%
3. **Patient Assessed and Symptoms Evaluated** Patient's complaints or symptoms are not thoroughly addressed.	35%
4. **Differential Diagnosis Established** Narrow diagnostic focus, failure to establish a differential diagnosis.	39%
5. **Diagnostic Test(s) Ordered** Ordering of appropriate tests/imagings is impeded by an incomplete or biased assessment.	36%
PHASE 2: TESTING AND RESULTS PROCESSING	
6. **Test Performed** Ordered test/imaging not performed, performed incorrectly, or mislabeled/mishandled.	4%
7. **Test Interpreted** Incomplete or inaccurate reports; abnormal findings not ruled out.	26%
8. **Test Results Transmitted to/Received by Ordering Physician** Receipt/review of test result by ordering clinician incomplete or delayed.	5%
PHASE 3: FOLLOW UP AND COORDINATION	
9. **Physician Follows Up with Patient** Findings not communicated to patient, follow up not arranged or not documented.	21%
10. **Referrals/Consults** Appropriate referrals not made or adequately managed.	24%
11. **Patient Information Communicated Among Care Team** Failure to fully review/share information that influences ongoing diagnostic process.	16%
12. **Patient and Providers Establish Follow-up Plan** Patient fails to adhere to the follow-up plan, appointments, or treatment regimen.	17%

*Diagnosis cases in the ambulatory care setting. Cases may have multiple issues.

CRICO 2018 CBS Benchmarking Report: Medical Malpractice in America – A Ten-Year Assessment with Insights



The majority of (ambulatory care) patients in diagnosis-related cases encountered problems at multiple points along the diagnostic process

Risk Management Issues Identified

- 26,506 specific causal factors identified in high-severity harm cases
  - Only 2.5% of cases with no RM issue identified
- Clinical judgment factors dominated:
  - Failure or delay in ordering a diagnostic test
  - Narrow diagnostic focus with failure to establish a differential diagnosis
  - Failure to appreciate and reconcile relevant symptoms, signs or test results
  - Failure or delay in obtaining consultation or referral
  - Misinterpretation of diagnostic studies (imaging, pathology, etc.)
- Distant second and third causal factors:
  - Communication factors and clinical systems factors

Aon/ASHRM Hospital and Physician Professional Liability Benchmark Analysis, October 2020

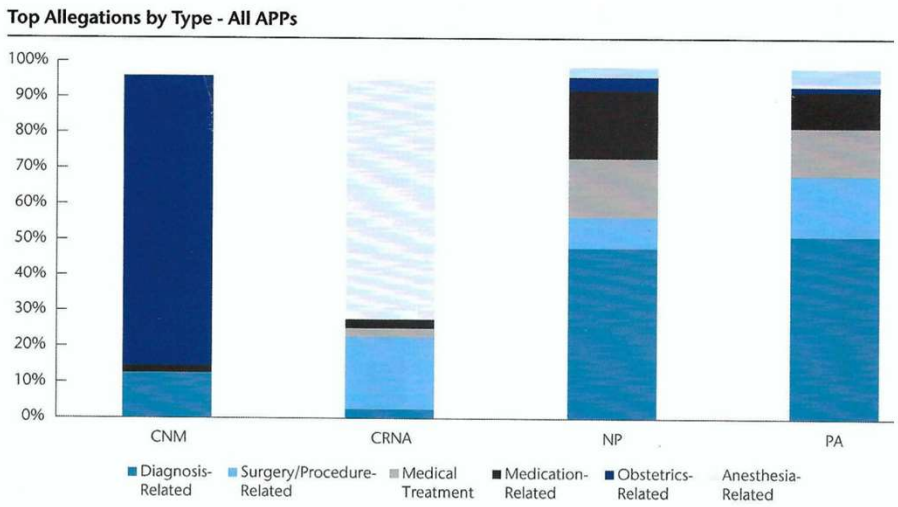


Figure 2.
N=400 closed claims from 2015-2019 with a named Advanced Practice Provider

400 closed claims involving 400 APP defendants, across 5-year period 2015-2019

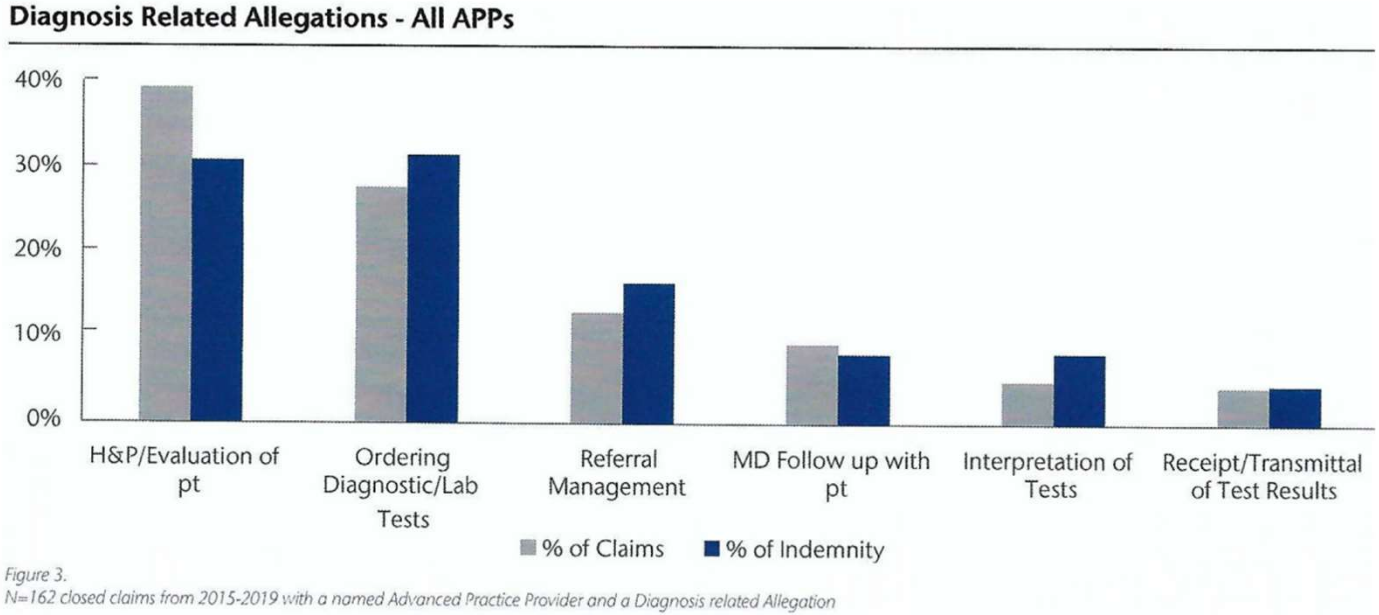


Figure 3.
N=162 closed claims from 2015-2019 with a named Advanced Practice Provider and a Diagnosis related Allegation

APP Risk Reduction Recommendations

- Hire appropriately
  - Screening, credentialing, clearly define supervisor responsibilities, ensure clinical care reviews are happening
- Implement written supervision/collaborative agreements
  - Know the law, ensure scope of practice aligns and is in writing, ensure regular agreement reviews are in place (at least every 2 years)
- Improve diagnostic accuracy through proper management of test results and referrals
  - Tracking system, managing critical results, documentation of non-critical results and communication to patients, incidental findings

Aon/ASHRM Hospital and Physician Professional Liability Benchmark Analysis, October 2020

Additional Risk Mitigation Activities: Diagnostic Error

- Conduct detailed risk assessment of process to reconcile lab and test results, particularly in outpatient settings
  - From order of test all the way through to documented patient notification
- Use of “diagnostic huddles” – discussion of challenging cases with symptoms that are unusual or not improving as expected or for determining whether anything has been missed
- Teamwork and communication training

How do we find these events before they find us in litigation?

- Refine event reporting categories
- Ask the patients – Follow-up with patients recently discharged or recently seen in the ER, and those returning to an outpatient setting with continuing complaints
  - Take advantage of Patient Experience (*I don't want to pay my ED bill because they missed my arm fracture!)*
- Ask the physicians – Identify a physician champion to receive reports
- Use 'trigger tools' to identify cases at high risk for error from the electronic medical records

How do we untangle these events?



Safer Dx Instrument

Screening tool to help determine the presence or absence of a diagnostic error for a specific episode of care.

The tool helps the reviewer think through the five main aspects of the diagnostic process described in the Safer Dx Framework

(1) the patient-provider encounter (H&PE, ordering tests/referrals based on assessment);

(2) performance and interpretation of diagnostic tests;

(3) follow-up and tracking of diagnostic information over time;

(4) subspecialty and referral-specific factors; and

(5) patient-related factors.

Singh, Hardeep, Khanna, Arushi, Spitzmueller, Christiane and Meyer, Ashley N.D.. "Recommendations for using the Revised Safer Dx Instrument to help measure and improve diagnostic safety" *Diagnosis*, vol. 6, no. 4, 2019, pp. 315-323. https://doi.org/10.1515/dx-2019-0012

The Safer Dx Instrument: Items for Determining Presence or Absence of a Diagnostic Missed Opportunity

Rate the following items for the episode of care under review:

1—2—3—4—5—6—7

1 = Strongly Disagree 7 = Strongly Agree

	Item	Score
1.	The documented history was suggestive of an alternate diagnosis, which was not considered in the diagnostic process.	
2.	The documented physical exam was suggestive of an alternate diagnosis, which was not considered in the diagnostic process.*	
3.	Data gathering through history, physical exam, and review of prior documentation (including prior laboratory, radiology, pathology or other results) was incomplete, given the patient's medical history and clinical presentation.	
4.	Alarm symptoms or "Red Flags" (i.e. features in the clinical presentation that are considered to predict serious disease) were not acted upon.	
5.	The diagnostic process was affected by incomplete or incorrect clinical information given to the care team by the patient or their primary caregiver.	
6.	The clinical information (i.e. history, physical exam or diagnostic data) should have prompted additional diagnostic evaluation through tests or consults.	
7.	The diagnostic reasoning was not appropriate, given the patient's medical history and clinical presentation.	
8.	Diagnostic data (laboratory, radiology, pathology or other results) available or documented were misinterpreted in relation to the subsequent final diagnosis.	
9.	There was missed follow-up of available or documented diagnostic data (laboratory, radiology, pathology or other results) in relation to the subsequent final diagnosis.	
10.	The differential diagnosis was not documented OR The documented differential diagnosis did not include the subsequent final diagnosis.	
11.	The final diagnosis was not an evolution of the care team's initial presumed diagnosis (or working diagnosis).	
12.	The clinical presentation at the initial or subsequent presentation was mostly typical of the final diagnosis.	
13.	In conclusion, based on all the above questions, the episode of care under review has a missed opportunity to make a correct and timely diagnosis.	

* Physical exam includes vital signs

Additional information, please check "Yes" if applicable:

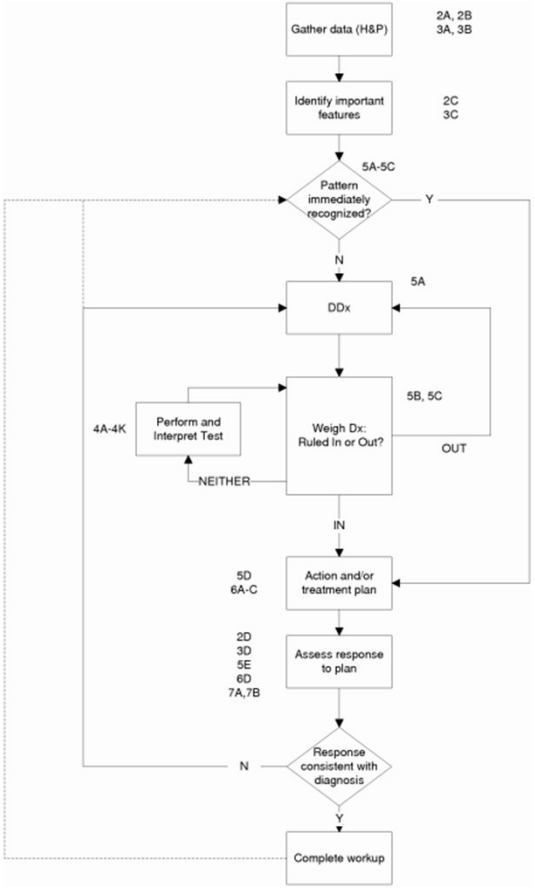
1. Care episode involves a management error. ☐ Yes
2. Care escalation (e.g. hospitalization at subsequent visit) was related to worsening of an original correctly diagnosed condition that the patient initially presented with (rather than from something being missed initially) ☐ Yes
3. Patient initially refused admission or additional evaluation. ☐ Yes

Brief description of missed diagnostic opportunity or management error and any relevant thoughts and observations

Diagnosis Error Evaluation and Research (DEER) taxonomy

Where in Diagnostic Process *(~Anatomic localization)*		**What** Went Wrong *(~Lesion)*
1. Access/Presentation	A	Failure/Delay in *presentation*
	B	Failure/denied care access
2. History	A	Failure/delay in *eliciting* critical piece of history data
	B	Inaccurate/misinterpretation "
	C	Failure in weighing "
	D	Failure/delay to follow-up "
3. Physical Exam	A	Failure/delay in eliciting critical physical exam finding
	B	Inaccurate/misinterpreted "
	C	Failure in weighing "
	D	Failure/delay to follow-up "
4. Tests (Lab/Radiology)		***Ordering***
	A	Failure/delay in ordering needed test(s)
	B	Failure/delay in performing ordered test(s)
	C	Error in test sequencing
	D	Ordering of wrong test(s)
	E	Test ordered wrong way
		Performance
	F	Sample mixup/mislabeled (eg wrong patient/test)
	G	Technical errors/poor processing of specimen/test
	H	Erroneous lab/radiol reading of test
	I	Failed/delayed reporting of result to clinician
		Clinician processing
	J	Failed/delayed follow-up of (abnl) test result
	K	Error in clinician interpretation of test
5. Assessment		***Hypothesis Generation***
	A	Failure/delay in *considering* the diagnosis
		Suboptimal weighing/prioritizing
	B	Too little consideration/weight given to the diagnosis
	C	Too much weight on *competing/coexisting* diagnosis
		Recognizing Urgency/Complications
	D	Failure/delay to recognize/weigh *urgency*
	E	Failure/delay to recognize/weigh *complication*(s)
6. Referral/Consultation	A	Failure/Delay in *ordering referral*
	B	Failure/delay obtaining/scheduling ordered referral
	C	Error in diagnostic consultation performance
	D	Failed/delayed communication/follow-up of consultation
7. Follow-up	A	Failure to refer patient to close/safe setting/monitoring
	B	Failure/delay in timely follow-up/rechecking of patient

Figure 2 Diagnosis Error Evaluation and Research (DEER) taxonomy.



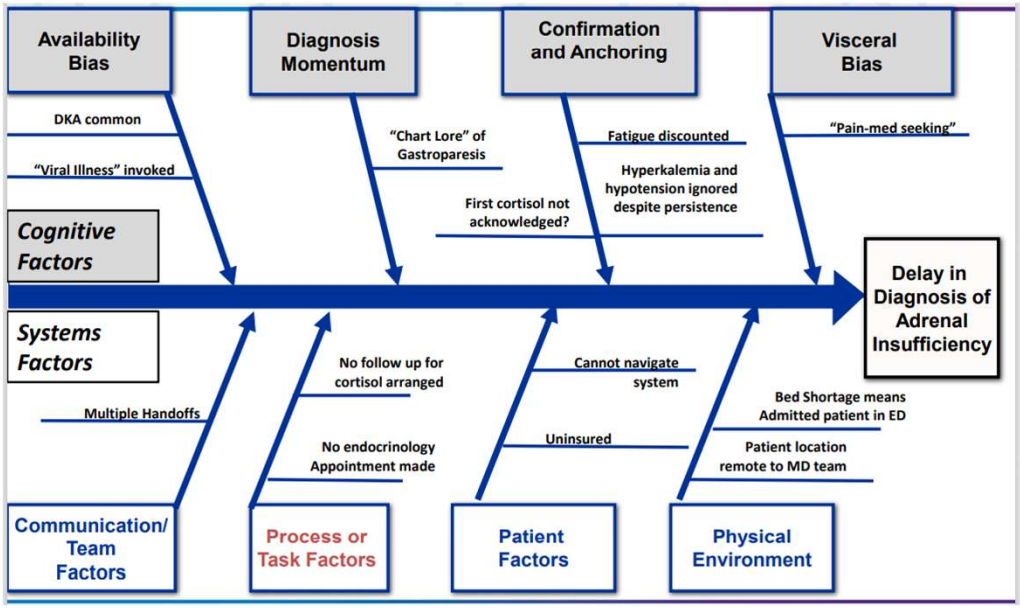
El-Kareh, Robert & Hasan, Omar & Schiff, Gordon. (2013). Use of health information technology to reduce diagnostic errors. BMJ quality & safety. 22. 10.1136/bmjqs-2013-001884.

Root Cause Analysis Specific to Diagnostic Events

	Traditional RCA	Dx Error RCA
Fishbone diagram	Yes	Yes
Systems analysis	Critical	Critical
Cognitive analysis	No	Critical
Clinician involvement	Variable	Mandatory
Clear action steps	Often	Sometimes
Proven effective	No	No
Recommendations implemented	70%	?

Who should be there

- The involved clinicians
- Nurses
- Expert RCA facilitators
- Cognitive specialists
- Error experts
- Librarians

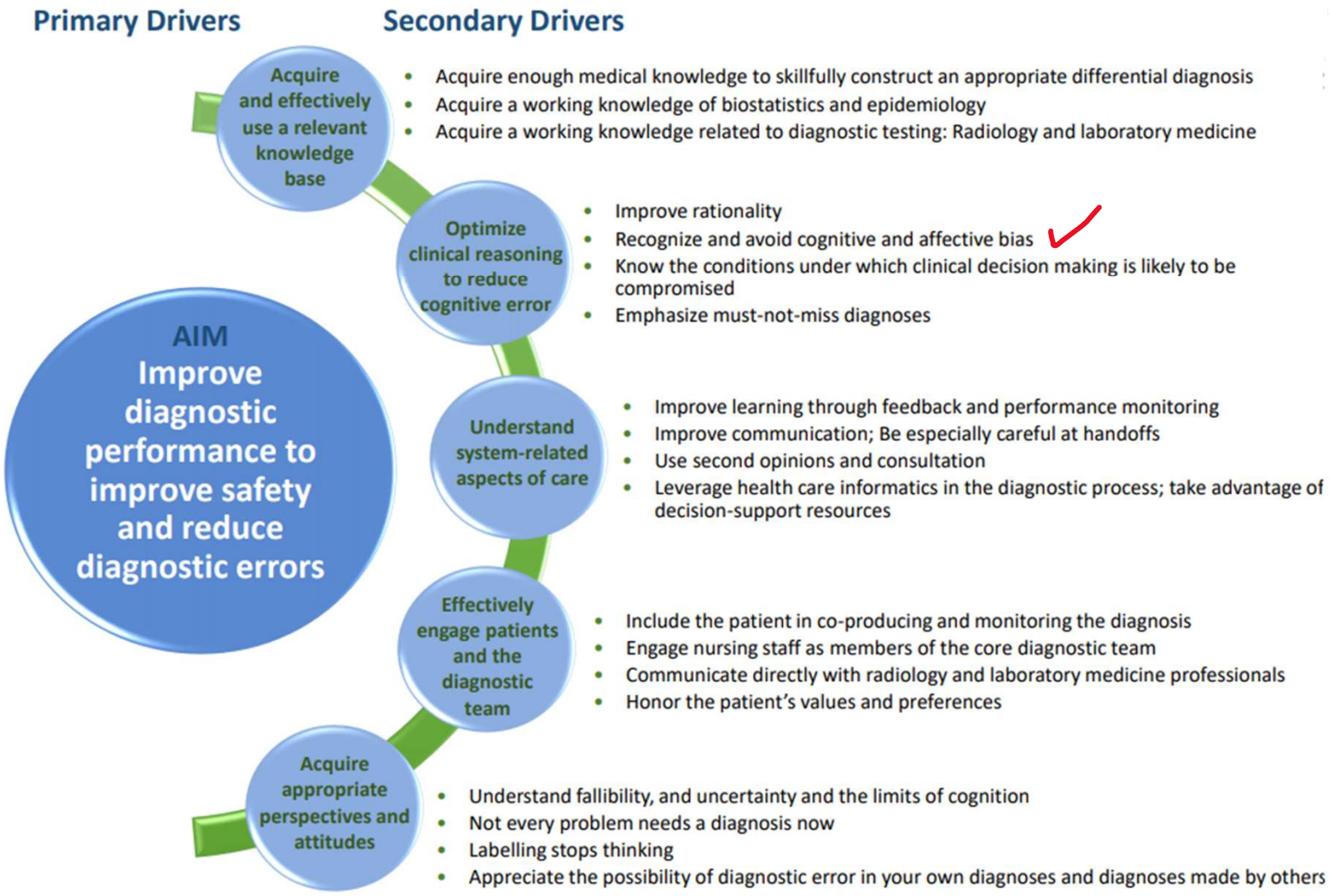


From "How to Do a Root Cause Analysis of Diagnostic Error," NPSF Patient Safety Awareness Week Diagnostic Error Webcast Series. (2014). Graber, M., Reilly, J. and Trowbridge, R. Found at: PowerPoint Presentation (ymaws.com)

What about the "cognitive" part of this problem?

The "Sharp" End:

Clinical Data + Knowledge → Synthesis = Diagnosis

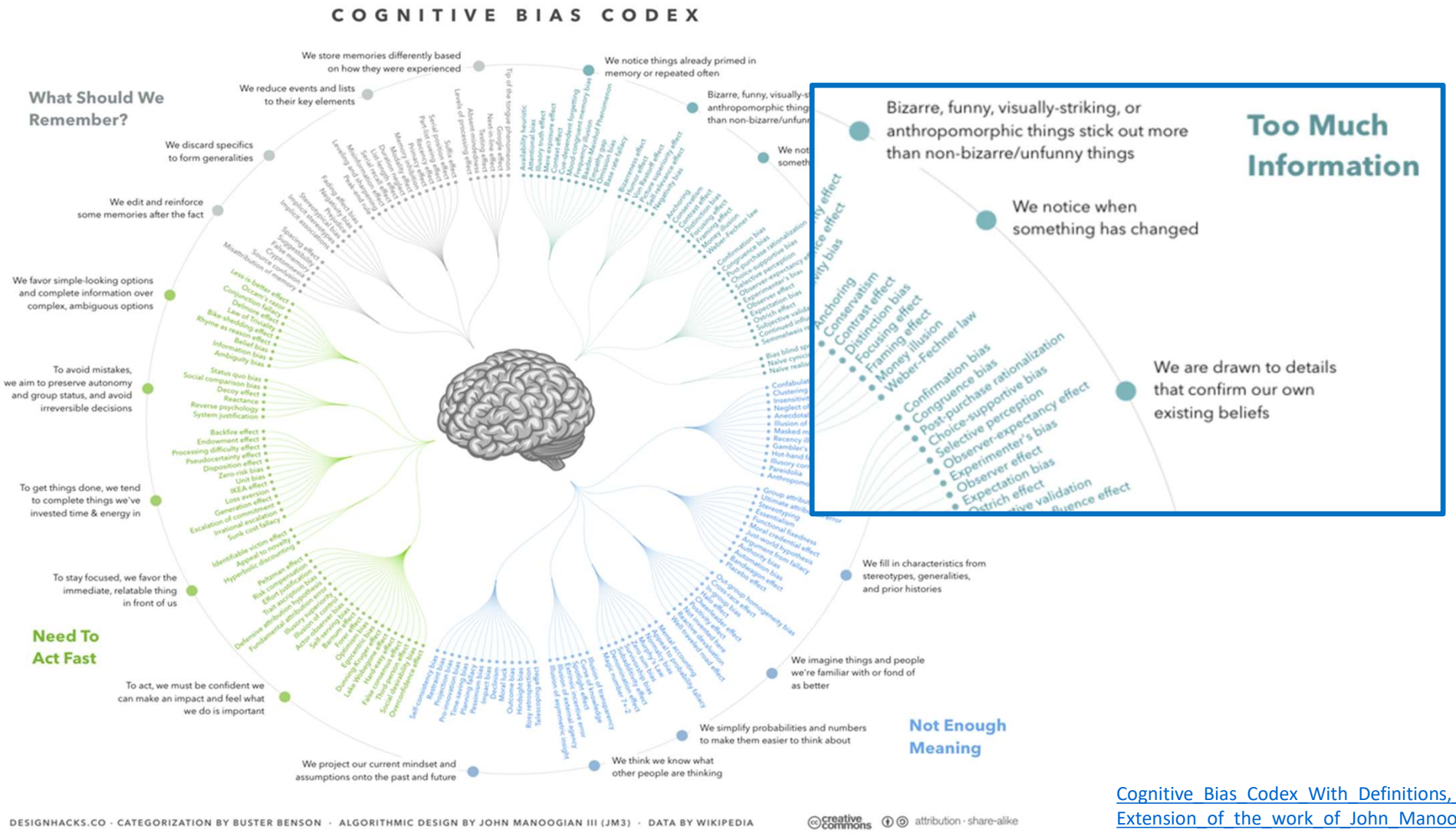


Graber, M.L. et al. Improving Diagnosis by Improving Education. Diagnosis, 2018; 5(3): 107-118.



“The world is a set of information that's just too enormous for your brain to handle.”

Buster Benson



https://commons.wikimedia.org/wiki/File:Cognitive_Bias_Codex_-_180%2B_biases,_designed_by_John_Manoogian_III_(jm3).jpg

Cognitive_Bias_Codex_With_Definitions,_an_Extension_of_the_work_of_John_Manoogian_by_Brian_Morrissette.jpg (6779×6185) (wikimedia.org)

Where does “bias” come in?

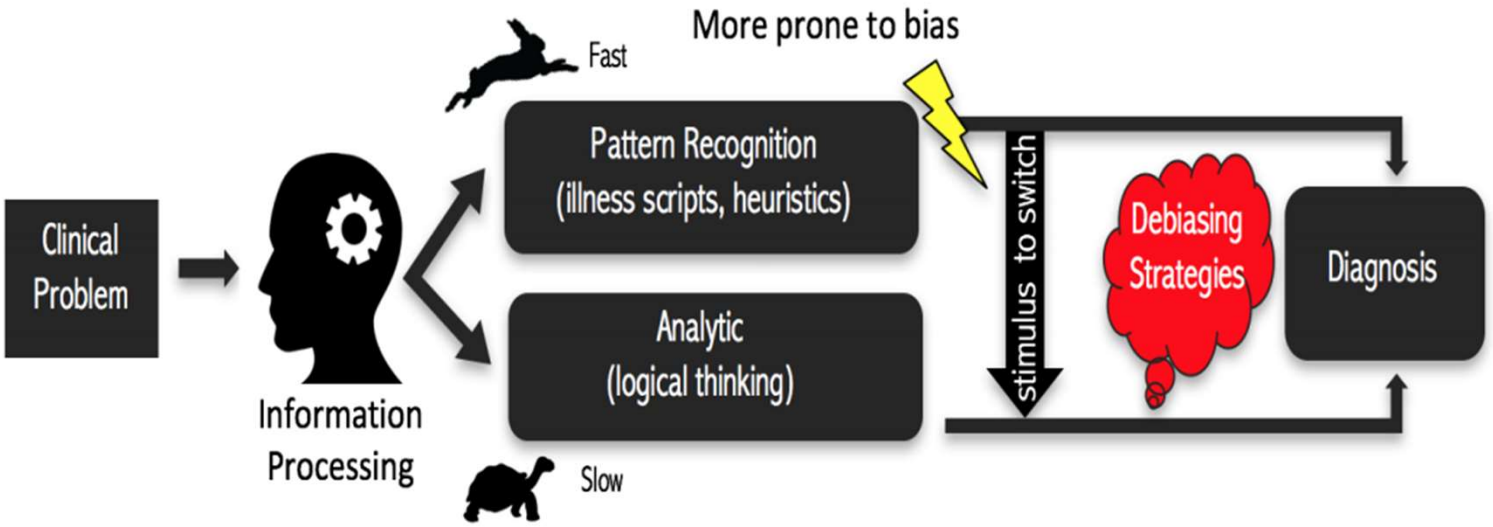
TABLE 2-2 Examples of Heuristics and Biases That Influence Decision Making

Heuristic or Bias	Medical Example	Nonmedical Example
Anchoring is the tendency to lock onto salient features in the patient's initial presentation and failing to adjust this initial impression in the light of later information.	A patient is admitted from the emergency department with a diagnosis of heart failure. The hospitalists who are taking care of the patient do not pay adequate attention to new findings that suggest another diagnosis.	We buy a new car based on excellent reviews and tend to ignore or downplay negative features that are noticed.
Affective bias refers to the various ways that our emotions, feelings, and biases affect judgment.	New complaints from patients known to be “frequent flyers” in the emergency department are not taken seriously.	We may have the belief that people who are poorly dressed are not articulate or intelligent.
Availability bias refers to our tendency to more easily recall things that we have seen recently or things that are common or that impressed us.	A clinician who just recently read an article on the pain from aortic aneurysm dissection may tend toward diagnosing it in the next few patients he sees who present with nonspecific abdominal pain, even though aortic dissections are rare.	Because of a recent news story on a tourist kidnapping in Country “A,” we change the destination we have chosen for our vacation to Country “B.”
Context errors reflect instances where we misinterpret the situation, leading to an erroneous conclusion.	We tend to interpret that a patient presenting with abdominal pain has a problem involving the gastrointestinal tract, when it may be something else entirely: for example, an endocrine, neurologic or vascular problem.	We see a work colleague picking up two kids from an elementary school and assume he or she has children, when they are instead picking up someone else's children.
Search satisficing, also known as **premature closure**, is the tendency to accept the first answer that comes along that explains the facts at hand, without considering whether there might be a different or better solution.	The emergency department clinician seeing a patient with recent onset of low back pain immediately settles on a diagnosis of lumbar disc disease without considering other possibilities in the differential diagnosis.	We want a plane ticket that costs no more than $1,000 and has no more than one connection. We perform an online search and purchase the first ticket that meets these criteria without looking to see if there is a cheaper flight or one with no connections.

Improving Diagnosis in Health Care, Chapter 2: The Diagnostic Process. Committee on Diagnostic Error in Health Care; Board on Health Care Services; Institute of Medicine; The National Academies of Sciences, Engineering, and Medicine; Balogh EP, Miller BT, Ball JR, editors. Washington (DC): National Academies Press (US); 2015 Dec 29.

Cognitive Debiasing Strategies for the Emergency Department

Model of Reasoning and Debiasing:



Modified from: Daniel M, Khandelwal S, Santen SA, Malone M, Croskerry P. Cognitive Debiasing Strategies for the Emergency Department. AEM E&T. 2017; 1:41-42.

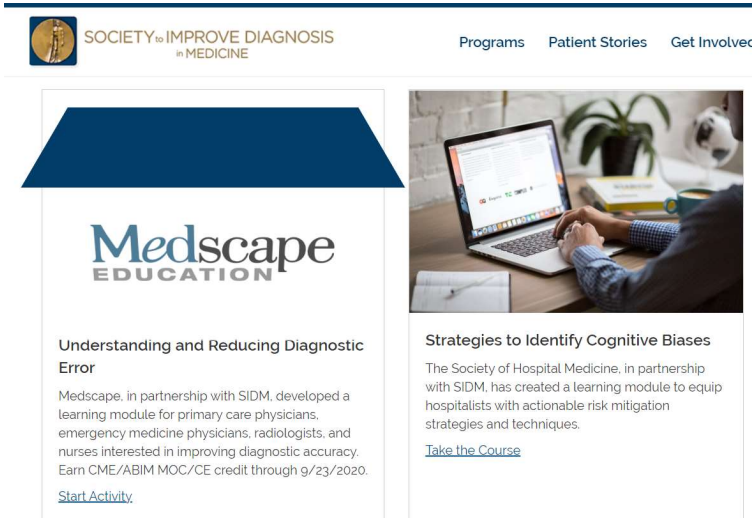
Daniel, M., Carney, M., Khandelwal, S., Merritt, C., Cole, M., Malone, M., Hemphill, R. R., Peterson, W., Burkhardt, J., Hopson, L., & Santen, S. A. (2017). Cognitive Debiasing Strategies: A Faculty Development Workshop for Clinical Teachers in Emergency Medicine. *MedEdPORTAL : the journal of teaching and learning resources*, *13*, 10646. https://doi.org/10.15766/mep_2374-8265.10646.

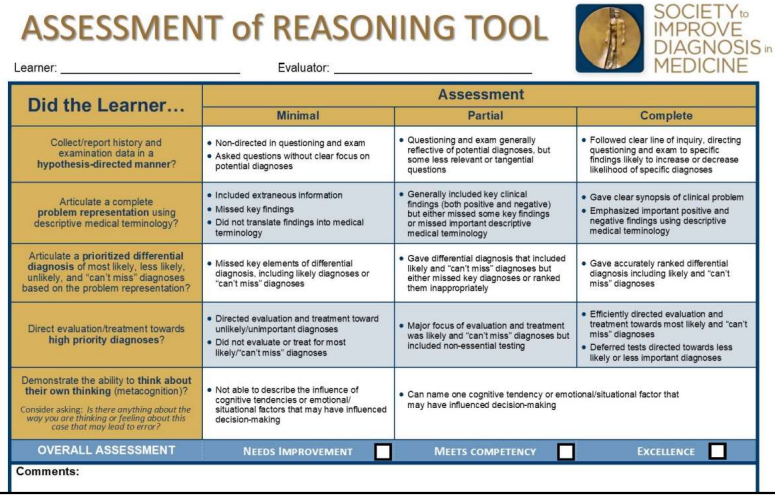
Bias	Description / Example	Debiasing strategy
Aggregate bias	A belief that aggregate data (i.e. practice guidelines) does not apply to individual patients, which can lead to unnecessary testing.	Routinely apply guidelines / clinical decision rules. Superiority over clinical judgment has been demonstrated. E.g. PERC rule, NEXUS criteria
Anchoring bias	Anchoring onto particular features early in a presentation is normal, but bias occurs when we persist with the initial anchor and fail to adjust when new data suggests another diagnosis.	Avoid sticking with early impressions, judgments and preconceptions. Seek more information. Revisit diagnosis with new data. Mnemonics (i.e. VINDICATES*) can help broaden the differential.
Availability bias	A tendency to judge things as more likely if they readily come to mind. Recent exposure to a disease increases the likelihood of it being diagnosed, whereas not seeing a disease for a long time decreases the likelihood.	Judge cases on their own merits rather than recent experiences. Be aware of the recency effect. Question the objective basis for clinical decisions.
Confirmation bias	An inclination to seek evidence to support a diagnosis rather than refute it. Ex. Allowing N/V and photophobia to confirm Migraine HA, rather than seeking clues that would refute the diagnosis of SAH (gradual onset).	Consider the opposite. Try to disconfirm initial hypothesis. Ensure alternatives are considered. Argue the case for *and* against.
Triage Cueing	A predilection to allow triage to signal subsequent diagnoses and management, meaning patients placed in non-acute areas are not sick.	See the patient yourself and form your own impressions BEFORE reading the triage summary, nurses' notes, or hearing a learner's case presentation.
Diagnosis momentum	A propensity for labels or diagnoses to "stick" once they have been applied. This process may start with anyone (the patient, EMS, nurses, medical students, residents, other attendings) and continues as data is related from person-to-person. The diagnosis gathers momentum often without gathering evidence.	Two heads (or many) are better than one. You will invariably each pick up important data that the other person did not. Collectively this information forms a more complete picture of the case. "Group think" should be used for difficult cases. Ask a colleague for an independent assessment or a second opinion. Do not 'frame' the patient to a colleague, give objective data.
Premature closure	A readiness to accept a diagnosis before it has been fully verified.	Force consideration of alternative possibilities. Generate and work through a reasonable differential diagnosis. Also be sure to ask, "What else might this be?" Always rule out worst-case scenarios (ROWS).
Representativeness Restraint	A habit of looking for prototypical manifestations of disease such that atypical variants may be missed.	Be aware of individual variation and atypical presentations. What looks like a duck, walks like a duck, quacks like a duck, may not be a duck.
Search Satisficing	A readiness to call off a search once something is found.	The most commonly missed fracture is the second one. Always consider comorbidities. E.g. A patient presents with diabetic ketoacidosis. What was the trigger?
Psych-out error	An impulse to assume a psychiatric etiology, and overlook serious medical conditions (i.e. hypothyroidism misdiagnosed as depression; chest pain attributed to anxiety.	Employ "until proven otherwise" to ensure that you do not make a psychiatric diagnosis until other diagnoses have been systematically excluded. Return to a broad differential diagnosis before settling.
Visceral bias	A disposition to be influenced by affective sources of error. Countertransference may be in the form of negative feelings towards particular patient populations (i.e. obese, chronic pain, chronic intoxicants), or positive emotions (i.e. this patient reminds me of my mom.)	Remember to act calm no matter how you feel and be aware of emotion on decision-making. Take extra time to look at all the data and employ evidence based medicine. Objective scientific data should aid analytic decisions instead of feelings.

* **VINDICATES**: **V**ascular, **I**nfection, **N**eoplastic, **D**rugs / Toxins, **I**nflammatory / **I**diopathic, **C**ongenital, **A**utoimmune, **T**rauma, **E**ndocrine / **E**nvironmental, **S**omething Else / p**S**ychological

Daniel, M., Carney, M., Khandelwal, S., Merritt, C., Cole, M., Malone, M., Hemphill, R. R., Peterson, W., Burkhardt, J., Hopson, L., & Santen, S. A. (2017). Cognitive Debiasing Strategies: A Faculty Development Workshop for Clinical Teachers in Emergency Medicine. *MedEdPORTAL : the journal of teaching and learning resources*, *13*, 10646. https://doi.org/10.15766/mep_2374-8265.10646

Risk Mitigation Activities: Diagnostic Error





ASSESSMENT of REASONING TOOL

SOCIETY to IMPROVE DIAGNOSIS in MEDICINE

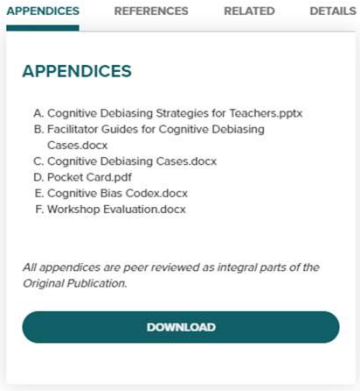
Learner: _____ Evaluator: _____

Did the Learner…	Assessment		
	Minimal	Partial	Complete
Collect/report history and examination data in a **hypothesis-directed manner?**	• Non-directed in questioning and exam • Asked questions without clear focus on potential diagnoses	• Questioning and exam generally reflective of potential diagnoses, but some less relevant or tangential questions	• Followed clear line of inquiry, directing questioning and exam to specific findings likely to increase or decrease likelihood of specific diagnoses
Articulate a complete **problem representation** using descriptive medical terminology?	• Included extraneous information • Missed key findings • Did not translate findings into medical terminology	• Generally included key clinical findings (both positive and negative) but either missed some key findings or missed important descriptive medical terminology	• Gave clear synopsis of clinical problem • Emphasized important positive and negative findings using descriptive medical terminology
Articulate a **prioritized differential diagnosis** of most likely, less likely, unlikely, and "can't miss" diagnoses based on the problem representation?	• Missed key elements of differential diagnosis, including likely diagnoses or "can't miss" diagnoses	• Gave differential diagnosis that included likely and "can't miss" diagnoses but either missed key diagnoses or ranked them inappropriately	• Gave accurately ranked differential diagnosis including likely and "can't miss" diagnoses
Direct evaluation/treatment towards **high priority diagnoses?**	• Directed evaluation and treatment toward unlikely/unimportant diagnoses • Did not evaluate or treat for most likely/"can't miss" diagnoses	• Major focus of evaluation and treatment was likely and "can't miss" diagnoses but included non-essential testing	• Efficiently directed evaluation and treatment towards most likely and "can't miss" diagnoses • Deferred tests directed towards less likely or less important diagnoses
Demonstrate the ability to **think about their own thinking** (metacognition)? *Consider asking: Is there anything about the way you are thinking or feeling about this case that may lead to error?*	• Not able to describe the influence of cognitive tendencies or emotional/ situational factors that may have influenced decision-making	• Can name one cognitive tendency or emotional/situational factor that may have influenced decision-making	
OVERALL ASSESSMENT	Needs Improvement ☐	Meets Competency ☐	Excellence ☐

Comments:

[Assessment of Reasoning Tool]: Errors in clinical reasoning are central factors in many dx errors. SIDM has developed a straightforward Assessment of Reasoning Tool to support educators in assessing a learner's clinical reasoning skills during patient presentations.





SOCIETY to IMPROVE DIAGNOSIS in MEDICINE

System-Based Competencies

Identify and understand the systems factors that facilitate and contribute to timely, accurate diagnoses and error avoidance.

Competencies

- Discuss how human factors contribute to diagnostic safety and error by identifying how the work environment influences human performance. Take steps to mitigate common systems factors that detract from diagnostic quality and safety. Use local resources (including people, teams, and technology, especially the electronic health record) effectively and efficiently to optimize patients' access to care, diagnostic testing services, and appropriate experts for consultation.
- **Advance a culture of diagnostic safety** that encourages open dialogue and continuous learning from analysis and discussion of excellent diagnostic performance, near misses, and errors.Give and receive feedback at an i team level to improve subsequent diagnostic performance.
- Disclose diagnostic errors and missed opportunities transparently and in a timely manner to patients, fami members, supervisors, and appropriate quality and risk management staff.

Learning Objectives

S-1. *Identify and understand the systems factors that facilitate and contribute to timely, accurate diagnoses anc avoidance.*

- Describes how harm arises from multiple latent system flaws. Appreciates that most diagnostic errors are attributable to system-related shortcomings, and that Reason's "Swiss Cheese" model is so often appropri examples of the most common problems: Breakdowns in communication, coordinating care, finding expe need it, arranging tests and consults and following up on results, ensuring appropriate follow-up, etc.
- Helps the patient navigate the healthcare system during the diagnostic journey and facilitates this to the e
- Skillfully interacts with all of the many players in the healthcare system to help arrive at a timely and accu doesn't just trust that everything will happen as planned.
- Identifies recurring system-related flaws and problems to supervisors and recommends how these could fixed.
- Uses knowledge of local policies, procedures, and resources to help patients navigate and expedite their journey

S-2. *Advance a culture of continuous learning that encourages open dialogue and learning from excellent diag performance, near misses and errors. Give and receive feedback at an individual and team level to improve sub diagnostic performance.*

Diagnostic Testing

Use these tools appropriately and efficiently in the diagnostic process: Effective interpersonal communication skills, history-taking, the physical examination, and record review; diagnostic testing; and the electronic health record and health IT resources.

General Learning Objectives

Test Ordering

- Reviews previous tests to guide ordering.
- Uses published and local testing algorithms or protocols when appropriate. Uses disease-specific test algorithms, 'bundles' and reflexive testing appropriately.
- Knows whom to contact with test-ordering questions.
- Appreciates how pre-analytical variables impact testing plans (e.g., time-sensitive tests for drug levels, biological variability, circadian rhythm).
- Can identify unsuitable samples (e.g., insufficient volume, wrong container, sample hemolysis).
- Minimizes patient venipunctures and draw volume by correct testing ordering.
- Appreciates the cost of diagnostic testing and reimbursements related to inpatient vs outpatient testing; avoids low-value or obsolete tests; uses the ABIM "Choosing Wisely" guidelines.
- For imaging studies: Uses guidance from American College of Radiology (ACR) Image Gently and Image Wisely™ campaigns and ALARA principles for diagnostic imaging
- Appreciates the concept of turn-around-time, how to order 'stat' testing when appropriate, and the need to follow-up on tests with longer turn-around-times, such as pathology results, and tests sent to an outside reference laboratory.
- Uses a systematic approach to know whether or not ordered tests were performed.
- Appropriately orders or requests help in ordering appropriate tests for unique populations, including pediatric patients, pregnant patients, the elderly, and patients who cannot provide informed consent.

Test Results

- Understands test interference, contamination, cross-reactions; familiar with the possibility of false positive or false negative tests.

https://www.improvediagnosis.org/consensuscurriculum-competencies/

How do we solve the problem of lack of data?



Goal 6:

Develop a Reporting Environment and Medical Liability System That Facilitates Improved Diagnosis by Learning from Diagnostic Errors and Near Misses

Work Underway for Event Reporting Opportunities

- Common Formats for Event Report – Diagnostic Safety (CFER-DS)
  - AHRQ, NQF and a Federal Patient Safety Workgroup are developing a national consensus on a structured way to to help healthcare providers identify and report missed opportunities in the diagnostic process in a standardized manner across healthcare settings and specialties.
  - AHRQ Released CRER-DS Version 0.1 for public comment on June 1st; comments due June 30th.
  - Common Formats are not a reporting system, just structured data elements – you see the consistency when reporting to a PSO.

Event ID: _____

AHRQ Common Formats for Event Reporting – Diagnostic Safety Version 0.1

Patient Safety Event Report

DS DIAGNOSTIC SAFETY

Use this form to gather information about a Diagnostic Safety Event for patient safety and quality improvement purposes.

- IMPORTANT: Please review the instructions and definitions in the Guide before you begin. Terms that appear in capital letters are defined in the Guide.
- The word "patient" includes or means the patient's parent, guardian, representative and/or family where applicable.
- Use the optional Brief Narrative in Section 5 if you would like to further explain your response to any of the questions.

TABLE OF CONTENTS

1.0 The Accurate (Final) Diagnosis	Page 2
2.0 Details About One Diagnostic Episode with Missed Opportunities	Page 5
3.0 Impact of the Diagnostic Safety Event on the Patient	Page 12
4.0 Patient and Reporter Data	Page 13
5.0 Brief Narrative (Optional)	Page 14

2.2.6.5 Imaging/Other Diagnostic Testing

- 2.2.6.5.1 Additional details unknown
- 2.2.6.5.2 Patient factors (e.g., unable to tolerate test, access issue)
- 2.2.6.5.3 Ordering Clinician factors (e.g., appropriate test(s) not selected/ordered, communication of clinical information needed for test, communication with patient)
- 2.2.6.5.4 Performing/interpreting Clinician factors (e.g., ordered tests not performed or interpreted completely/correctly, communication with patient)
- 2.2.6.5.5 Work environment (e.g., space, lighting, noise, privacy)
- 2.2.6.5.6 Work processes/workflow (e.g., delay or ordered test not performed or read, discrepant initial vs. final read, report processing, misidentification)
- 2.2.6.5.7 Organizational factors other than HIT (e.g., test availability, availability/usability of equipment/supplies)
- 2.2.6.5.8 HIT (e.g., design/usability of order entry screens, clinical decision support, picture archiving and communication system (PACS), availability/organization/display of content, alerts, copy/paste, patient portal)
- 2.2.6.5.9 Ordered test(s) false positive or false negative
- 2.2.6.5.10 Other

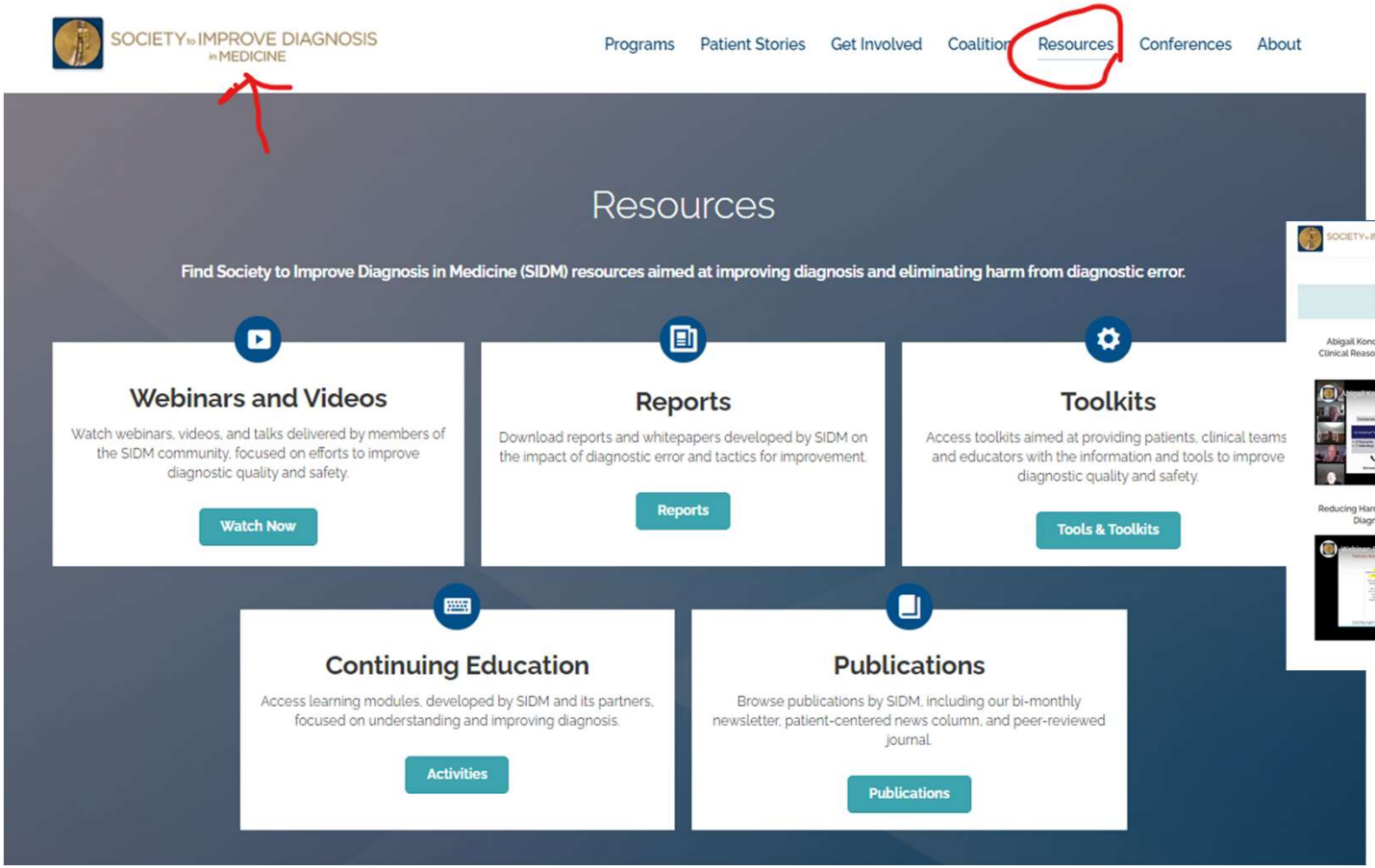
The CFER-DS can be used as part of diagnostic safety and quality improvement activities in any healthcare setting…is also potentially useful to structure analysis of individual cases. It can form the basis for patient safety and quality improvement activities undertaken by individual clinicians and clinicians in training, service lines and clinical departments in hospitals, medical practices and other ambulatory care settings, and across different healthcare facilities and health systems.

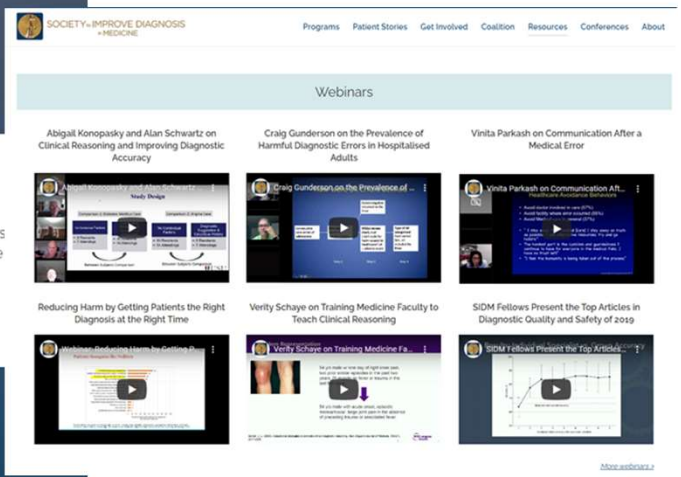
Diagnostic Excellence

Where Does Leadership Come In? Selling the Work to the C-Suite

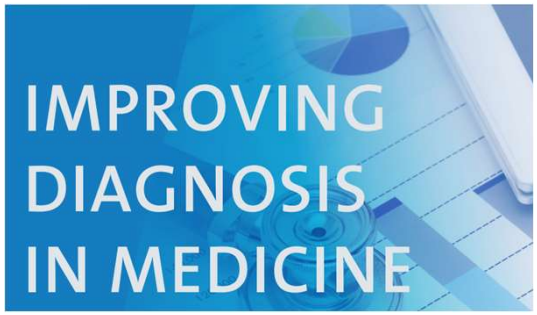
Resources

Society to Improve Diagnosis in Medicine
(www.improvediagnosis.org)





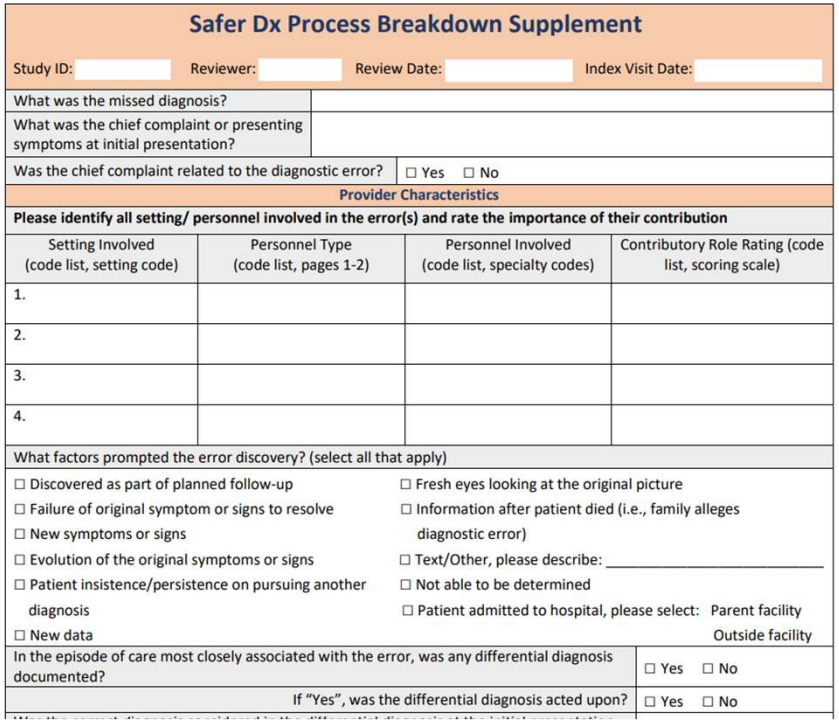
HRET: Diagnostic Error Top Ten Checklist



1. Provide and promote patient access to electronic health records (EHRs), optimally including real-time clinical notes and diagnostic testing results.
2. Evaluate patient and family engagement practices, organizational structure, clinical operations, and access to care, including patient access to EHRs, to support the diagnostic environment and diagnostic process.
3. Implement clinical decision support tools that improve cognitive performance and reflective self-practice.
4. Provide regular education and training on clinical reasoning and decision pitfalls.
5. Establish a learning environment, inclusive of patients and family members, with an infrastructure based on safety culture, transparency, quality improvement, and education.
6. Measure and report diagnostic errors regularly for greater transparency and visibility.
7. Provide orientation and training on diagnostic safety and quality to support patient and family participation in governance, including on patient and family advisory councils, practice improvement teams, and boards.
8. Provide tools and credible resources for patients and family members and use engagement methods to optimize participation in the diagnostic process. Tools and methods include Society to Improve Diagnosis in Medicine tools, shared decision making, teach-back, patient activation strategies (PAM), and discharge checklists.
9. Adapt the Partnership for Patients preadmission checklist to orient patients to the diagnostic process, which effectively invites them to participate in the process.
10. Develop systems for seeking out and studying diagnostic errors, including using the diagnostic error fishbone diagram for root cause analyses.

Health Research & Educational Trust. (September 2018). Improving Diagnosis in Medicine Change Package. Chicago, IL: Health Research & Educational Trust. Accessed at http://www.hret-hiin.org/ Accessible at: http://www.hret-hiin.org

Medical Record Review Tools specific to Dx Error



Safer Dx Process Breakdown Supplement

Study ID: Reviewer: Review Date: Index Visit Date:

What was the missed diagnosis?	
What was the chief complaint or presenting symptoms at initial presentation?	
Was the chief complaint related to the diagnostic error?	☐ Yes ☐ No

Provider Characteristics

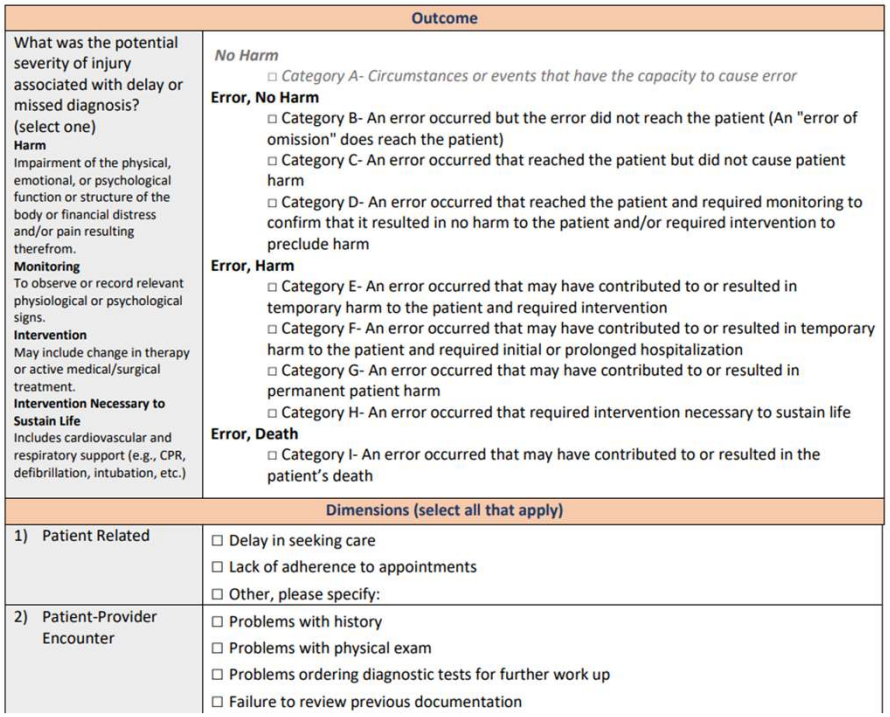
Please identify all setting/ personnel involved in the error(s) and rate the importance of their contribution

Setting Involved (code list, setting code)	Personnel Type (code list, pages 1-2)	Personnel Involved (code list, specialty codes)	Contributory Role Rating (code list, scoring scale)
1.			
2.			
3.			
4.			

What factors prompted the error discovery? (select all that apply)

- ☐ Discovered as part of planned follow-up
- ☐ Failure of original symptom or signs to resolve
- ☐ New symptoms or signs
- ☐ Evolution of the original symptoms or signs
- ☐ Patient insistence/persistence on pursuing another diagnosis
- ☐ New data
- ☐ Fresh eyes looking at the original picture
- ☐ Information after patient died (i.e., family alleges diagnostic error)
- ☐ Text/Other, please describe: _____
- ☐ Not able to be determined
- ☐ Patient admitted to hospital, please select: Parent facility Outside facility

In the episode of care most closely associated with the error, was any differential diagnosis documented?	☐ Yes ☐ No
If "Yes", was the differential diagnosis acted upon?	☐ Yes ☐ No



Outcome

What was the potential severity of injury associated with delay or missed diagnosis? (select one)

Harm
Impairment of the physical, emotional, or psychological function or structure of the body or financial distress and/or pain resulting therefrom.

Monitoring
To observe or record relevant physiological or psychological signs.

Intervention
May include change in therapy or active medical/surgical treatment.

Intervention Necessary to Sustain Life
Includes cardiovascular and respiratory support (e.g., CPR, defibrillation, intubation, etc.)

No Harm
- ☐ *Category A- Circumstances or events that have the capacity to cause error*

Error, No Harm
- ☐ Category B- An error occurred but the error did not reach the patient (An "error of omission" does reach the patient)
- ☐ Category C- An error occurred that reached the patient but did not cause patient harm
- ☐ Category D- An error occurred that reached the patient and required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm

Error, Harm
- ☐ Category E- An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention
- ☐ Category F- An error occurred that may have contributed to or resulted in temporary harm to the patient and required initial or prolonged hospitalization
- ☐ Category G- An error occurred that may have contributed to or resulted in permanent patient harm
- ☐ Category H- An error occurred that required intervention necessary to sustain life

Error, Death
- ☐ Category I- An error occurred that may have contributed to or resulted in the patient's death

Dimensions (select all that apply)

1) Patient Related	☐ Delay in seeking care ☐ Lack of adherence to appointments ☐ Other, please specify:
2) Patient-Provider Encounter	☐ Problems with history ☐ Problems with physical exam ☐ Problems ordering diagnostic tests for further work up ☐ Failure to review previous documentation

Singh, Hardeep, Khanna, Arushi, Spitzmueller, Christiane and Meyer, Ashley N.D.. "Recommendations for using the Revised Safer Dx Instrument to help measure and improve diagnostic safety" *Diagnosis*, vol. 6, no. 4, 2019, pp. 315-323. https://doi.org/10.1515/dx-2019-0012



Questions?

Thank you!

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