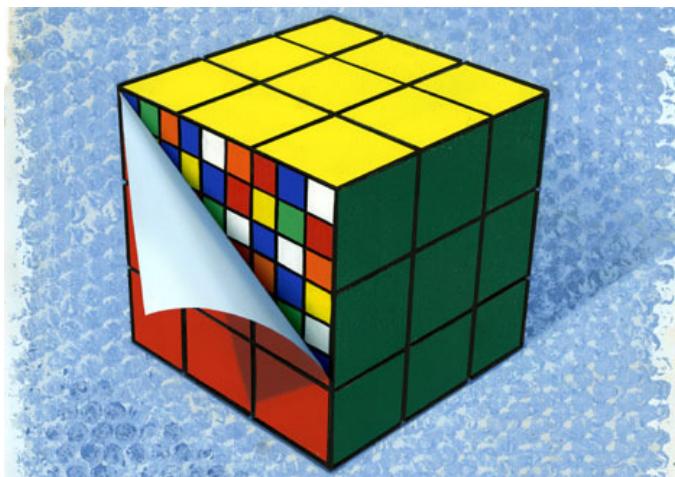


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Diagnostic errors: Why they happen

Mental shortcuts and poor communication can lead to missed diagnoses, but the search is on for ways to prevent these sometimes catastrophic mistakes.

By KEVIN B. O'REILLY, *amednews* staff. Posted Dec. 6, 2010.

Within five years, Susan Sheridan's family was devastated by two diagnostic errors. The first came in 1995, when her newborn son Cal's early development of jaundice -- a red flag for the potential of the severe neurological disorder kernicterus -- fell through the gaps in the system despite repeated attempts to alert physicians and other health professionals. As a result of delayed treatment, Cal developed cerebral palsy and has dealt with several other neurological problems.

Then in 1999, Sheridan's husband, Pat, was told that the mass discovered in his cervical spine was benign. Six months after an apparently successful surgery to remove the mass, Pat again required surgical intervention. This time, physicians said the fist-size tumor was malignant.

But when Sheridan checked her husband's medical chart, she was shocked to discover a pathologist's report issued 21 days after the first surgery. The report said that first mass was malignant.

"My knees buckled," said Sheridan, co-founder and president of Consumers Advancing Patient Safety, a Chicago-based patient advocacy organization. "It was unbelievable to me that a second significant gap in the health care system had tragically impacted my family. It was a double whammy, and it made me realize how very, very fragile our health care system is."

The pathologist's report apparently never made it to the neurosurgeon caring for Pat, who died after three agonizing years with spinal cancer and many more surgeries.

Diagnoses that are delayed, wrong or missed entirely result in 40,000 to 80,000 U.S. hospital deaths annually, according to research estimates. About 5% of autopsies find clinically significant conditions that were missed and, if treated, could have resulted in the patient surviving the hospital stay. Meanwhile, about 40% of medical liability lawsuits involve diagnostic errors. Nearly one in three reported adverse events involve diagnostic errors, and more than 10% of these mistakes result in death.

For the Sheridan family, two kinds of diagnostic errors resulted in calamity. In Cal's case, a series of cognitive errors -- not realizing that early-onset jaundice could be a sign of something much worse -- was to blame. And a system error -- failing to properly communicate a critical test result -- was at fault in Pat's case.

Experts say these two kinds of mistakes often conspire to make diagnostic errors a daunting patient-safety challenge. Fledgling efforts are under way to understand how these errors, which strike at the heart of the physician's craft, happen and to find ways to prevent them.

Thinking about thinking

"Most of the time diagnosis occurs within a minute, and most of the time your first impression is right," said Kaveh G. Shojania, MD, who has written studies reviewing autopsy examinations of diagnostic errors and directs the University of Toronto Centre for Patient Safety.

But for those cases when the first diagnosis is wrong, Dr. Shojania said, the so-called anchoring bias can take hold -- a cognitive mistake in which physicians hold on to an incorrect diagnosis and ignore new information that might lead to a different conclusion. The anchoring bias is one of many mental shortcuts that all people, physicians included, take that usually turn out well but can lead to mistakes.

40% of medical liability lawsuits involve diagnostic

Other cognitive biases, experts say, include prematurely coming to a diagnostic conclusion and simple overconfidence in one's ability to come up with the right answer.

"There is nothing special about what doctors do -- these are mistakes we all make," said Gordon Schiff, MD,

errors.

associate director of the Center for Patient Safety Research and Practice at Brigham and Women's Hospital in Boston. "We jump to conclusions. We always assume we're thinking about things in the right context, and we may not be. We don't do a broader search for other possibilities."

Dr. Schiff co-chaired the third annual Diagnostic Error in Medicine conference, held in Toronto in October and funded by the Agency for Healthcare Research and Quality. The meetings are part of an effort to bring more attention to the problem of diagnostic errors, which Dr. Schiff said has gotten short shrift in the broader patient safety movement.

"There has been a lot of focus on medication errors, wrong-site surgery and things that are in a way more straightforward in terms of their fix than diagnostic errors, which are a bit murkier," Dr. Schiff said. "This sort of cuts to the core of how doctors view themselves; they pride themselves on trying to be good diagnosticians, but it's really something that's not easy."

Some experts believe that teaching physicians to be wary of the pitfalls of cognitive biases could help them use metacognition -- thinking about their thinking -- to reduce the chances of harmful diagnostic errors.

"As we train our residents in patient safety, a big part of what we are teaching you to do is not just what is the differential diagnosis of chest pain and shortness of breath, but how do really good clinicians think and how do people make cognitive errors," said Robert Wachter, MD, chief of the medical service at the University of California, San Francisco, Medical Center. "It takes mental exercise to build up those muscles."

5% of autopsies find clinically significant conditions that were missed.

Others are not so hopeful.

"These cognitive biases are deeply ingrained in the way the brain is wired," said Arthur S. Elstein, PhD, professor emeritus in the Dept. of Medical Education at the University of Illinois College of Medicine in Chicago and a pioneer in the psychological research on diagnostic errors. "It's possible that if one were continually vigilant and kept in mind that we tend to be overconfident, one could minimize the fact of these biases, but people just can't be that vigilant. You get distracted. If you've got five patients in the waiting room, well, you've got to get through the day."

Even awareness of these mental tendencies may not be enough to help physicians avoid mistakes, Elstein said.

"These biases are a little like optical illusions," he said. "You know you're being fooled, but it still looks that way."

Systemic problems -- and solutions

Just one in three diagnostic errors results solely from physicians' cognitive mistakes, according to a July 11, 2005, *Archives of Internal Medicine* analysis of 100 cases. The rest are caused by system problems such as delayed tests, malfunctioning equipment or a combination of cognitive and system errors.

Given the fragmented nature of the American health system, there are many chances for dropped balls that can lead to diagnostic errors, said Hardeep Singh, MD, MPH, program chief of the Health Policy and Quality Program at the Houston Veterans Affairs Health Services Research and Development Center of Excellence.

Among the things that can go wrong, Dr. Singh said:

- Tests may not get ordered, followed up on or be interpreted correctly.
- Referrals may not occur because patients do not follow through; consultants also may fail to report back.
- Patients may not keep their follow-up appointments.

The challenge of reaching the correct diagnosis becomes harder without all the necessary clinical information, he said. In 2005, the Joint Commission required that hospitals "report critical results of tests and diagnostic procedures on a timely basis," but the commission said more than a quarter of hospitals surveyed in 2009 failed to comply with the goal.

Experts hope that health information technology can help hospitals and physician practices overcome these communication mishaps, but many say that what is desperately needed is a way for physicians to get feedback from their peers about their clinical reasoning skills. Along these lines, patient-safety leaders at Maine Medical Center, a 600-plus bed facility in Portland, are implementing a system to allow physicians to report diagnostic errors anonymously.

Missed or wrong diagnoses cause 40,000 to 80,000 deaths a year in the U.S.

A computer desktop icon on all clinical work stations allows users to submit a patient's medical record number, the type of error involved, a brief description and whether any harm resulted. An expert physician reviewer examines the case and determines if an error occurred and how, but no blame is placed on an individual doctor, and patient identifiers are not included in the medical center's final database. The goal is to identify patterns of diagnostic errors and improve in those areas, said Robert Trowbridge, MD, director of faculty development for the Maine Medical Center's Dept. of Medicine.

"This is obviously a sensitive subject," Dr. Trowbridge said. "When you make a mistake writing the wrong dose ... it's easier to justify those mistakes in our minds knowing we're human and we're fallible. It's much harder to say, 'I made a mistake in my thinking,' because that's a core part of who I am as a physician."

But, Dr. Trowbridge said, doctors are driven to help their colleagues avoid diagnostic errors. Unlike other patient-safety issues that may seem tangential to doctors' roles, these mistakes draw heavy physician interest, said Doug Salvador, MD, MPH, the medical center's patient-safety officer and associate chief medical officer.

"For each of the two root-cause analyses we've done in the last four months on diagnostic error cases, we had eight physicians in the room for all four-plus hours," Dr. Salvador said. "We've never had eight physicians in a root-cause analysis meeting before. It's something physicians want to talk about."

While research continues into figuring out how to track and ultimately prevent diagnostic errors, experts said physicians could benefit from the simple step of opening clear lines of communication with their patients.

"This problem is going to require a partnership with the patient," said Dr. Schiff, noting that doctors should tell patients if they are uncertain

about a diagnosis and ask them to report symptoms that could signal a misdiagnosis. "Diagnosis is not just something that doctors make and patients consume. Diagnosis is something that they produce together."

The print version of this content appeared in the **Dec. 13** issue of *American Medical News*.

ADDITIONAL INFORMATION:

Avoid jumping to a conclusion

Everyone is prone to taking mental shortcuts when thinking through difficult problems, and experts say physicians are no exception. Here are a few of the cognitive biases that can lead to diagnostic errors.

Anchoring bias: Locking on to salient features in a patient's initial presentation too early in the diagnostic process and failing to adjust in light of later information.

Availability bias: Judging things as being more likely if they readily come to mind; for example, a recent experience with a disease may increase the likelihood of it being diagnosed.

Confirmation bias: Looking for evidence to support a diagnosis rather than looking for evidence that might rebut it.

Diagnosis momentum: Allowing a diagnosis label that has been attached to a patient, even if only as a possibility, to gather steam so that other possibilities are wrongly excluded.

Overconfidence bias: Believing we know more than we do, and acting on incomplete information, intuitions and hunches.

Premature closure: Accepting a diagnosis before it has been fully verified.

Search-satisfying bias: Calling off a search once something is found.

Source: "The importance of cognitive errors in diagnosis and strategies to minimize them," *Academic Medicine*, August 2003 (www.ncbi.nlm.nih.gov/pubmed/12915363)

Beyond the doctor's control

Nearly two-thirds of missed or delayed diagnoses involve systems-related problems that can make it harder for physicians to reach the correct diagnosis. Here are areas of failure and the problems they represent:

Policies and procedures: Lack of protocols exist to ensure appropriate follow-up.

Inefficient processes: There are unnecessary delays in scheduling clinic visits or procedures.

Teamwork: Needed information or skills go unshared.

Management: Studies are not read in time; x-rays are lost or misplaced.

Care coordination: Consult requests are lost or not acted upon promptly.

Equipment: Test instruments are faulty, miscalibrated or unavailable.

Supervision: There is a failure to oversee trainees properly.

Expertise: Required specialists are not available in a timely fashion.

Source: "Diagnostic Error in Internal Medicine," *Archives of Internal Medicine*, July 11, 2005 (archinte.ama-assn.org/cgi/content/abstract/165/13/1493)

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"Diagnostic Error in Medicine" annual meetings, Society for Medical Decision Making (www.smdm.org/diagnostic_errors.shtml)

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