4 Ways to support diagnostic accuracy
Care teams seeking to diagnose a patient’s condition have more medical information readily available online than ever before.

“Dr. Internet” can be a wonderful tool to help identify or verify a diagnosis, but the sheer volume of online information — much of which can be misleading or inaccurate — can, in some cases, interfere with patient care.

Improving the quality of care has been a primary focus for physicians and care teams since 1999, when the Institute of Medicine’s (IOM’s) landmark report, “To Err Is Human,” estimated that as many as 98,000 patients die in U.S. hospitals each year because of preventable medical errors.¹

At that time, diagnostic error was not identified as a patient safety problem. Since then, however, diagnostic inaccuracy has been revealed as a serious shortcoming in health care. In 2015, the National Academies of Sciences, Engineering, and Medicine (the successor to the IOM) issued “Improving Diagnosis in Health Care,” a report with this dire assessment: “It is likely that most people will experience at least one diagnostic error in their lifetime, sometimes with devastating consequences.”²

Diagnostic errors — defined as inaccurate or delayed diagnoses — are common in all care settings and harm an unacceptable number of patients, the report stated. Victims of diagnostic errors may not receive the appropriate treatment; they may receive treatments that are unnecessary or harmful; or they may experience psychological or financial repercussions as a result of a mistake.

Indeed, diagnostic errors contribute to about 10% of patient deaths and are responsible for between 5% and 17% of hospital adverse events, according to the National Academies’ report. Diagnostic error, the leading type of medical malpractice claims resulting in a payout, are almost twice as likely to result in patient death than other types of claims.²
A common, deadly problem.

The prevalence of diagnostic errors is substantial: At least 5% of U.S. adults — an estimated 12 million individuals — treated in an outpatient setting each year receive an inaccurate or delayed diagnosis.²

Three renowned patient-safety experts — Lucian Leape, M.D.; Don Berwick, M.D.; and David Bates, M.D. — have estimated that 40,000 to 80,000 hospital deaths each year can be attributed to missed diagnoses.³

An analysis of medical malpractice claims stemming from diagnostic error identified many causes, including communication failures, inadequate documentation and electronic health record problems. But the most frequent cause was breakdown in clinical judgment.⁴

That does not suggest that care teams are being careless; they are working with the same diligence and commitment to their patients that they have always demonstrated. Rather, the explosion in medical information is making their work much more difficult than in previous generations. For that reason, they need access to tools that provide the accurate, timely, evidence-based information required to make accurate diagnoses in today’s fast-paced health care environment.

Digital diagnosis: Help or hindrance?

Dr. Internet is popular with the public. Symptom checkers and other online resources provide access to a vast array of medical information that, before the World Wide Web, would have been unthinkable. More than a third of U.S. adults have used online sources to diagnose themselves or someone else.⁵

Physicians also turn to the internet for medical information. A survey of more than 2,500 U.S. physicians working across 27 specialties found that 70% search online daily; 46% of oncologists use online search engines for professional purposes at least four times a day.⁶

They have good reasons for doing so. First, medical knowledge is expanding so quickly that the information learned in medical school — or read in a medical journal last year — may be out of date by the time a physician needs it. One estimate projects that, as of the start of 2020, medical knowledge will double every 73 days.⁷

Care teams are expected to provide medical advice that is thorough, complete and based on the latest medical knowledge. With the ongoing explosion of new information, the only way to keep up is by using online resources.

Physicians also rely on the internet because they need quick access to information to share with patients or for clinical decision-making. And, because of their fast-paced practices, they are often pressed for time. While they rely on a wide variety of sources to stay abreast of new medical knowledge, if they have 10 minutes or less to answer a question, physicians frequently rely on the internet.⁸

The downside to Dr. Internet is that online sources are not always accurate or helpful. A 2014 IMS Institute for Healthcare Informatics study found that 50% of physicians use Wikipedia for information, especially for specific conditions.⁹ Another study found many errors in Wikipedia entries for common health conditions. Scientists reviewed Wikipedia entries for coronary disease, lung cancer, hypertension, back pain and six other medical conditions and discovered that 9 of 10 entries included assertions that were contradicted by peer-reviewed journals.¹⁰

Many other sources of online medical information are similarly unreliable. A review of the 150 most-viewed YouTube videos about prostate cancer found that they often include misleading or biased information that could pose a health risk to patients. More than 75% of the videos included either factual errors or biased content in the video itself or its comments section.¹¹
Case story: e-cigarette/vaping injury

To highlight the deficiencies of online content, consider the following:

In mid-2019, a 16-year-old presented with a cough, shortness of breath and chest pain. Symptoms had emerged gradually over several weeks. Clinical teams are accustomed to diagnosing and successfully treating a wide range of pediatric conditions, so the care team considered a wide range of possible diagnoses.

The severity of the patient’s symptoms made diagnosis difficult. The patient was admitted to the intensive care unit and placed on a ventilator. Antibiotics did not seem to be effective.

Widespread news coverage was emerging about serious lung injuries caused by vaping black-market tetrahydrocannabinol (THC) products. The patient’s care team needed immediate information about a condition with which they had no experience.

The patient reported a history of vaping, but denied use of THC. An overwhelming amount of information on the internet presented conflicting information about the sharp increase in “vape lung” cases. Many of them suggested that the problems were caused by vaping THC products. Clinicians initially ruled out vaping as the cause of the patient’s illness. They started evaluating the possibility of infectious, rheumatologic or neoplastic disease.

The patient eventually was diagnosed with EVALI — e-cigarette or vaping product use-associated lung injury — a name given by the Centers for Disease Control and Prevention in October 2019. The patient was then treated with corticosteroids.

The CDC identified vitamin E acetate, not THC, as a “chemical of concern” among people with EVALI. Laboratory testing of fluid samples collected from the lungs of 29 EVALI patients in 10 states found vitamin E acetate in all of the samples; THC was identified in 82% of the samples. No other chemical found in e-cigarette products was found in all the samples.
Improving diagnostic accuracy with better information

Clinicians like accessing information online when they are trying to make a diagnosis and treatment plan. These four actions will increase the likelihood that their internet interactions lead to the right diagnosis.

1. **Check the source of medical information.**
   Much of the free information about symptoms, medical conditions and treatments online is not trustworthy and relying on it can be dangerous. Care teams must take responsibility for evaluating online resources before using information for decision-making. This can be a time-consuming process, but it is an essential component of good patient care.

2. **Create protocols to orient the entire care team around accurate, meaningful information.**
   All care team members should rely on the same sources of information. Failure to do so creates a risk that patients will receive conflicting information. Patients who are confused or lose confidence in the information they are receiving from the care team may not comply with the treatment plan, leading to undesirable outcomes.

3. **Prioritize evidence-based information specific to a clinician’s discipline.**
   Clinicians value evidence-based information that provides the level of detail needed to feel confident that the source is trustworthy. When they feel confident that they are working with the best information available, they are more likely to avoid errors, improve diagnostic accuracy, and create treatment plans aligned with that trusted evidence.

4. **Facilitate critical-thinking in today’s fast-paced world.**
   Because of rapidly expanding knowledge, clinicians need to master the process of discovery rather than rely entirely on their past experience. Furthermore, the increasing rate patients presenting with complex conditions and comorbidities requires access to deeper information than what synoptic content alone can offer.

Health system leaders can best support their physicians in the difficult task of diagnosis by providing clinical knowledge solutions such as Elsevier’s ClinicalKey that enable clinicians to quickly find, synthesize and apply evidence-based medical knowledge in their daily practice.

Learn more at [elsevier.com/clinicalkey](https://elsevier.com/clinicalkey)

---

3. https://jamanetwork.com/journals/jama/fullarticle/2845204
6. https://www.mmm-online.com/home/channel/media-news/physicians-still-rely-on-medical-journals-but-turn-to-the-web-when-they-have-only-10-minutes/
8. https://www.mmm-online.com/home/channel/media-news/physicians-still-rely-on-medical-journals-but-turn-to-the-web-when-they-have-only-10-minutes/

Copyright © 2020 Elsevier, except certain content provided by third parties