

Diagnostic errors in medical practice

Changing the culture around medical errors is one of the most important challenges faced by medicine and other health care disciplines. Such change began more than two decades ago, but has barely been implemented; so the challenge ahead of us is enormous. Notwithstanding, and although at a slow pace, several goals have been achieved in terms of patient safety that help to reduce errors and risks in medical care.

Diagnostic errors have been in the spotlight lately, and mechanisms and adverse events related to such errors are now being better understood. Their actual frequency is unknown; although our wrong decisions are more common than what we thought: the rate of diagnostic errors is estimated to be at least 25%. A systematic review assessed thousands of autopsies from 1966 to 2002 and detected diagnostic errors as a probable cause of death. The mean rate of errors was 23.5% (Shojania KG, et al. JAMA 2003).

It is worth pointing out that diagnostic errors lead to more adverse events than other types of error, which reach 15-20%, and are also the hardest to prevent. In spite of such worrying information, medical literature on these errors is more limited than on any other.

Likewise, it should be noted that diagnostic errors are the main reason for medical liability and malpractice litigation and greatly exceed the number of lawsuits related to surgical procedures and medication errors.

Several unfavorable factors of medical practice have an impact on diagnostic failures, especially because they unduly interfere with patient-physician relationships. At present office visits are shorter and shorter, resulting in very little dialogue with patients or their parents and therefore, in little time to listen to them. From ancient times our language has been an instrument of inquiry and knowledge that was based on three essential conditions: empathy, communication skills, and the necessary time to let words unfold their power. Today this has become an uncommon gift because, for several reasons, communication has replaced dialogue with a long series of surrogates.

These days there is also wide access to medical information, which is mostly irrelevant and far exceeds what is necessary to be a good doctor. This may lead, or probably has already led, to the risk of having doctors who are only supported by

copious amounts of recent information, who also assume they have a vast knowledge, when it is usually the opposite.

What are the mechanisms involved in diagnostic errors?

One of the main causes is cognition failure or bias; however, errors are not mostly provoked by a lack of knowledge, but by problems in medical thinking.

Thinking is regulated by rules with automatic short circuits and stereotypes, of which we are hardly aware. It is not common for doctors to explicitly state how they think; the thoughtful pause indispensable to reveal reasoning, formulate hypotheses, and make conclusions usually, has not place in our everyday practice.

A frequent cognitive failure in the thinking process, *not knowing that one does not know*, leads doctors to believe that their diagnosis is correct or that they have made the right decision, when in fact they did not. This is greatly because there is a lack of desire and capability to reflect on the thinking process and to make a critical assessment of our clinical judgment before making a decision. It is worth mentioning that most diagnostic errors are not related to severe conditions but to the most common illnesses.

Several mechanisms are involved in cognitive failures, mainly in relation to the complexes that allow our brain to receive and process information. Psychologists studying cognition have made great contributions, such as the mind's vulnerability to cognitive biases, logical thinking fallacies, false assumptions, and other reasoning failures. Our thinking has been shown to be defective in several of our day-to-day actions.

The two most important modes of this mechanism are called automatic and controlled, or "intuitive" and "analytical", as most commonly defined. The intuitive process is innate, evolves with experience, and requires little reasoning because it is mostly involuntary and automatic. It is also subconscious and quick, allowing us to handle most of our day-to-day actions in the field of human interaction. In general, we move through life going from one intuitive association to the next in a series of action patterns that are often mechanical. Although essential, such patterns involve cognitive failures and most thinking failures and biases.

Intuition is a very good quality and usually leads to adequate results in clinical assistance, we may rely on it, but we should always have in mind that it will invariably fail with some patients because it is not one hundred percent reliable. A critical attitude and reflection will help us here because these are critical attributes to practice medicine in an adequate fashion.

By contrast, analytical processes are conscious, deliberate, more gradual and generally reliable. They follow the laws of science and logic, so they are probably rational. Failures may occur anyway, but usually when applying the wrong rules or when other factors take part, such as short time at office visits, excessive working hours, fatigue, lack of sleep, emotional disturbances, stress, etc. The main problem with analytical reasoning is that it requires many resources and, in the field of medicine, making every decision in an analytical manner may result somehow impractical and improbable.

Another aspect that contributes to errors is the excessive confidence that doctors have on their diagnostic accuracy. This takes place when the relationship between an accurate clinical judgment and confidence is not adequately balanced because confidence exceeds what it should actually be.

Where does this attitude come from?

Many professionals believe that "they know everything they need to know," but this is an all-powerful and arrogant attitude that reveals a lack of interest in the possibility of modifying their behavior. The cognitive failure mentioned above plays a significant role in this attitude: not knowing what one does not know. Charles Darwin's quote: "*Ignorance more frequently begets confidence than does knowledge*" could be easily applied to this situation.

When excessive confidence prevails, it may mask hesitation in medical practice. This leads to the impossibility of tolerating uncertainty and assuming that certainty is prevalent in medicine. The trend towards such excessive confidence may be related to the fact that although doctors are aware of the possibility of failure, they usually believe that it is someone else's fault.

In addition, a review of medical practice conducted in the United States found out

that a great number of doctors do not follow medical associations' guidelines. For example, when assessing the management of hypercholesterolemia, 95% of doctors knew recommendations but only 18% followed them.

A recent study (Meyer AN, et al. *JAMA Intern Med* 2013) revealed, among other things, that diagnostic accuracy decreased as the complexity of cases managed by doctors increased. However, in these situations confidence remains practically unchanged, which is the opposite of what is expected because both accuracy and confidence should decrease in such circumstances. Authors concluded that there may not be an adequate association between doctors' diagnostic accuracy and their confidence in such accuracy, and improving such association may help to reduce diagnostic errors.

What can we do?

As indicated above, it is true that problems underlying health care systems contribute to making a wrong or delayed diagnosis, so solving them has become a pressing need. It is also true that doctors' cognitive biases play a significant role in most diagnostic errors; therefore, improvement is in our hands. It is fundamental to include cognitive psychology as a medical skill so that the relevant objective of involving students and doctors in "metacognition" (thinking about one's thinking) is achieved, hoping that they will gain some knowledge of their incorrect use of heuristics (an inquiry technique) before causing any damage.

When making medical decisions, continuous failures in thinking errors jeopardize patient safety. Many doctors are unaware of their limitations or are not interested in the aspects involved in their decisions, especially because at the university they did not learn to practice critical thinking which would help them make deep reflections on their actions.

These recommendations are not optional; they are an integral part of medical education, an unavoidable ethical principle and, therefore, a moral and professional duty. ■

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