

# Doctors overestimate risk leading to over-diagnosis, overtreatment, study finds

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Primary care practitioners often over-estimate the likelihood of a patient having a medical condition based on reported symptoms and laboratory test results. Such overestimations can lead to overdiagnosis and

overtreatment, according to a recent study conducted by researchers at the University of Maryland School of Medicine (UMSOM) published in *JAMA Internal Medicine*.

"A large gap exists between practitioner estimates and scientific estimates of the probability of disease," said study leader Daniel Morgan, MD, a Professor of Epidemiology & Public Health at UMSOM. "Practitioners who overestimate the probability of disease might use that overestimation when deciding whether to initiate therapy, which could lead to the overuse of risky medications and procedures."

To conduct the study, Dr. Morgan and his colleagues surveyed 553 primary [health](#) practitioners, including residents, attending physicians, nurse practitioners and physician assistants, in Maryland and seven other states. Survey respondents were asked to determine how well they could estimate the risk of four well-known [health conditions](#) based on hypothetical diagnostic scenarios. The researchers found, based on symptoms and test results, that [health care providers](#) significantly overestimated the likelihood of conditions. For example, health care providers, on average, estimated a 70 percent likelihood of cardiac ischemia in patients who had a positive finding on a stress test. In reality, based on evidence from [medical studies](#), the real likelihood of cardiac ischemia is 2 to 11 percent.

The study also found that [survey respondents](#) estimated a 50 percent risk of breast cancer after a positive finding on a mammogram when evidence suggests 3 to 9 percent chance of breast cancer. They estimated an 80 percent likelihood of a urinary tract infection from a positive urine culture, and the vast majority of survey respondents said they would treat with antibiotics in these cases. The real risk of a UTI with a positive urine culture, however, is at most 8 percent.

"Solving this problem is not about asking health care providers to

memorize numbers or practice math in order to improve their understanding of risks," Dr. Morgan said. "We should, however, use probability and better utilization of decision-making tools to help them make better estimates."

He developed a free tool called Testing Wisely, funded by the National Institutes of Health, that is designed to improve clinician understanding and ordering of diagnostic tests to make patient care safer. The site also includes a risk calculator to assess patients' symptoms, exposure, and local positivity rates where they live to calculate their individual risk of having COVID-19.

"Informed medical decision-making is incredibly important, and physicians should have access to tools that make their job easier and improve patient safety," said E. Albert Reece, MD, Ph.D., MBA, Executive Vice President for Medical Affairs, UM Baltimore, and the John Z. and Akiko K. Bowers Distinguished Professor and Dean, University of Maryland School of Medicine. "This study demonstrates the need for better decision-making tools to help healthcare providers provide the best possible care to their patients."

**More information:** Daniel J. Morgan et al, Accuracy of Practitioner Estimates of Probability of Diagnosis Before and After Testing, *JAMA Internal Medicine* (2021). [DOI: 10.1001/jamainternmed.2021.0269](https://doi.org/10.1001/jamainternmed.2021.0269)

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