PERSPECTIVE

LESS IS MORE

Uncertainty and the Diagnostic Leviathan

Saurabh Jha, MD, MS
Department of Radiology, Hospital of the University of Pennsylvania, Philadelphia.

“She had a normal CT yesterday. Why another?” I asked the physician.

“That scan was enhanced. Contrast obscures small kidney stones. We need an unenhanced CT to rule out a stone,” he reasoned.

“A small kidney stone is unlikely to explain her pain. There was no hydrourephrosis or perinephric stranding. You will advise ‘avoid dehydration.’ This is good advice regardless of the presence of a 2-mm nonobstructing calculus,” I explained.

“We need to know why she has pain. You don’t know that a small stone is not the cause of her pain. You can’t rule that out,” he concluded.

Once that wildcard “cannot be ruled out” was played, an unfalsifiable truism, the battle of attrition was heading to a stalemate.

Twenty-four hours earlier, the physician suspected appendicitis in a young woman who presented with pain on the right side of the abdomen. He elicited rebound tenderness on physical examination. Computed tomography (CT) of the abdomen with intravenous and oral contrast medium showed a normal appendix, no acute intra-abdominal pathologic condition, and a trace fluid in the pelvis.

He proceeded logically to the next organ that could cause lower abdomen pain, the ovaries, and asked for an ultrasound to rule out ovarian torsion. A whimper from me that an unenlarged ovary on CT was unlikely to be twisted and that trace fluid in the pelvis is normal in young women was silenced with that truism: CT does not rule out ovarian torsion.

The ovaries were not twisted. The physician was running out of tests that could plausibly reassure sooner than the patient’s symptoms were resolving.

He considered an ultrasound to rule out cholecystitis, but the patient’s pain was obviously not due to cholecystitis. Murphy sign was negative, and the gallbladder was pristine on CT. He recalled my radiology report, which disclaimed, “note, the administration of contrast reduces the sensitivity for detecting small renal calculi.” And note he did.

Reduced sensitivity has an affectation of science but is another way of saying “cannot be excluded.” A radiologist’s disclaimer is a physician’s call to action.

“Does the pain feel like a band across your side that comes and goes?” he asked.

“Yes,” the patient affirmed.

Still in pain + cannot rule out small stone = pain is due to a small stone.

Let us analyze this scenario, a microcosm of overutilization. Summon the usual suspects of high costs of health care: greed, defensive medicine, and a demanding consumer.

The clinician did not stand to gain monetarily from imaging. It was the radiologist, the objector, who would gain financially, albeit indirectly. The physician had ruled out the litigators: acute appendicitis and ovarian torsion. If avoiding a subpoena were his primary concern, he would have stopped imaging when the patient moved from “uncertain litigation risk” to “uncertain diagnosis.”

How about the demanding consumer? The patient did not ask for ovarian torsion to be excluded. She did not wonder whether she had a small stone obscured by an archipelago of enhancing renal tissue. It is true that because patients do not bear the marginal costs for additional investigations they have little incentive to retard the avalanche of investigations. That does not mean that they are culpable for the avalanche.

What drives doctors to order tests? We order tests because we must know why. Anything can be known morphs into everything must be known. We have become curiosity’s promontory. Curiosity gets you to question but not to question the question. That is the task of judgment. We ask why but not so what. So what if there is a 2-mm renal stone? Why is sincere. So what is insouciant. We are conditioned to be sincere, not flippant.

We order CTS because we can. The CT heals us, and our patients. Uncertainty ails. Our intolerance of uncertainty is neither congenital nor stochastic. Our dislike of uncertainty has grown with the availability of imaging. It has reached its apotheosis because of rapid door-to-CT time, the removal of barriers to ordering, and the speed with which reports are rendered.

The diagnostic machinery has grown with our uncertainty; the process is recursive and the relationship is symbiotic. Uncertainty increases technology. Technology increases uncertainty.

Imaging has become ruthlessly efficient. Patients go from plain radiograph to CT to ultrasound in a matter of a few hours, with the press of a button. Alas, efficiency has killed the most potent diagnostic tool: time. The clock triages and discards diagnoses. But the clock asks that we trust our judgment. That we ask but not demand an answer instantly. That we hold our nerve. Time necessitates patience.

Our curiosity does not fall lightly on our patients. First, a CT scout to make sure that the oral contrast has reached the cecum. Then a CT. Then an ultrasound.

I, the radiologist, the manager of the physician’s uncertainty—the physician’s physician, introduced my own insecurity hidden in a truism of uncertainty, leading to quadratic uncertainty, a lot of uncertainty. I hedged. I hedged gratuitously.
Diagnostic medicine has changed from confirmation to refutation. Confirmation ends with confirmation. Refutation never ends. Like Achilles and the tortoise in Zeno's paradox, rule out never reaches its asymptote.

The physician found the 2-mm renal stone. He found an answer. Curiosity was satiated. The symptoms resolved. The patient promised to drink plenty of water in hot weather. The hospital was paid. The insurer adjusted the rates.

Yet so much was done by so many for so little. So much waste can be avoided by using probability and numbers and applying judgment—the components of rational medical decision making.

I recently experienced firsthand the impact of the US Food and Drug Administration’s (FDA) ban on chlorofluorocarbons as described by Jena et al.1 My daughter was home for vacation from college and needed to fill a prescription for an albuterol inhaler (Ventolin). I went to the pharmacy to pick it up, and when the pharmacist handed me the prescription, he said it would be $59.

Because our prescription coverage has always had a co-payment of $10 or $20, I questioned the higher charge. The pharmacist explained that they had Anna listed as not having prescription coverage in their system, although she has filled previous prescriptions at that pharmacy and our health insurance was unchanged. He (and I) tried to call our health insurer, but we could not reach a live person because it was New Year’s day. He assured me that, when the error was corrected, our insurer would refund the difference between the copayment and the full price.

Imagine my surprise when the next day the insurer told me they had a computer glitch on January 1 that was now corrected and that our co-payment was $40 because branded drugs have higher tiered co-payments. I knew Ventolin had been around since I was in medical school 30 years ago, so I was shocked that a drug that was an inexpensive generic was now only available as an expensive branded drug. The pharmacist explained to me that they had to fill with a branded inhaler because there were now only branded albuterol inhalers available.

Although this FDA ban on chlorofluorocarbon use in inhalers (which occurred after vigorous lobbying by a pharmaceutical industry consortium2) seems unlikely to have any meaningful impact on the environment, it has certainly taken an inexpensive generic medication and made it an expensive branded medication, with no change in the medication or new research and development costs. According to the data by Jena et al,1 many Americans who now need a bronchodilator are paying more than a 50% increase, or they are going without their medications. (Because the database used by Jena et al was limited to insured persons, the impact of this ban on the utilization of bronchodilators by uninsured persons could not be assessed.) Surely, the intent of the FDA in enforcing this clean air statute was not to enhance the profits of pharmaceutical companies and make yet another drug that has been around for decades less available to many Americans because of its high cost.

I agree with Jena et al that this policy could have been better implemented by regulating the cost of the new inhalers or by not considering a change in the delivery method of the same drug to be equivalent to developing a new and innovative drug in terms of branding. After all, the goal was clean air, not increased pharmaceutical profit.

Not Breathing Easier With the US FDA’s Ban on Chlorofluorocarbons in Inhalers

Rita F. Redberg, MD, MSc
Department of Medicine, University of California, San Francisco.

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Conflict of Interest Disclosures: Dr. Jha has received speaker’s fees from Toshiba. No other disclosures are reported.