The Case Records of the Massachusetts General Hospital

Shop Talk Heard 'Round the World:

Over the last century, physicians around the world have read the Case Records of the Massachusetts General Hospital, published in *The New England Journal of Medicine*. The cases have taught them how to diagnose and treat some of the most challenging and mysterious medical disorders and conundrums. More than 7,000 cases have appeared in the medical journal since October 1923. The editor of the Case Records—always an MGH pathologist—chooses cases based on their ability to educate new and seasoned physicians of all specialties.

"Case Records teach readers, through discussion, how to clinically reason their way to solving a complex problem."

— Eric Rosenberg, MD, current Case Records editor and director, MGH Microbiology Laboratories

A BETTER WAY TO TEACH MEDICINE

In 1898, Harvard Medical School student Walter B. Cannon, MD, advocated changing the day's standard four-hour "dreary and benumbing" lectures to more hands-on learning. MGH internist and HMS professor Richard C. Cabot, MD, took up the cause. Instead of simply regurgitating medical facts, medical students would now discuss actual cases of disease from their professors' patients, Cabot decided.

Cabot also believed the case method could help experienced physicians improve their diagnostic skills. "Full of vagueness, groping, hedging, and 'shotgun' prescriptions" is how he described most physicians' approaches.

"Before the 1900s, physicians treated any patient with a fever the same way. They couldn't do much medically for the patient anyway, so they focused on their therapeutic skills. Cabot pushed physicians to become diagnosticians as medicine began recognizing distinct disease entities. If a patient had chest pain, physicians now had to decide whether it was from heart disease, a pulmonary embolism, or a problem in the esophagus."

— Scott Podolsky, MD, MGH internist and director of the Center for the History of Medicine at Harvard Medical School

In 1910, Cabot and James Homer Wright, MD, the hospital's first full-time pathologist, began presenting cases of deceased patients to house officers and visiting physicians. Each Thursday at noon, a **clinicopathological conference**, or **CPC**, was convened at the Allen Street Amphitheater. An expert took the stage, walking the audience through the patient's history as they questioned him about his diagnostic methods. (The first woman discussant appears to have been Marian Ropes, MD, in 1942.) At the end, he would offer a diagnosis, which was then compared with the results of the patient's autopsy—then the only way to make a definitive diagnosis.

In 1915, Cabot began publishing the cases. Four records a week were mailed to roughly 800 subscribers, who paid $5 a year. In 1923, the inaugural Case Records of the Massachusetts General Hospital, edited by Cabot and his brother Hugh, appeared in *The Boston Medical and Surgical Journal* (which later became the *NEJM*).

Clinicopathological conferences, or CPCs, are the discussions that form the basis of the Case Records. For many years, CPCs were held in the Allen Street Amphitheater.

EXPERTS IN THE HOT SEAT

At the CPCs, medical students were asked to give their diagnosis before the expert revealed his opinion of what had ailed the patient. The entire discussion, along with the students' and expert's diagnosis, was published verbatim in the Case Records. When a medical student asked whether Cabot had considered rheumatic pneumonia as a diagnosis, he replied, "That's a good idea: I never thought of it." The autopsy proved the student correct. Cabot and others believed that confronting physicians' fallibility, even publicly, was an important element of teaching. "Too often in current medical literature we get accounts of brilliant successes, rather than of failures in diagnosis and treatment, which are of far higher educational value," noted an editorial in the *Boston Medical and Surgical Journal* a few months after Case Records launched.

As fewer patients died undiagnosed and as anesthesia improved, a surgical biopsy of tissue rather than autopsy often confirmed a diagnosis. Later, other diagnostic tools—lab and genetic tests, sophisticated imaging, and microbiological cultures— would help physicians diagnose and treat their patients. Yet even with more information at hand, doctors still get it wrong. Arnold Relman, longtime editor of the *New England of Medicine* and professor at Harvard Medical School, saw his CPC misdiagnosis published in his own journal in 1978. Like Cabot, the correct diagnosis had not occurred to him.

AN EXPANDING SCOPE

Nancy Lee Harris, MD, an MGH hematopathologist and the fourth editor of the Case Records, made a significant change to the Case Records formula in 2002. Laboratory medicine and imaging had become such good diagnostic tools that there were fewer true medical mysteries stumping physicians. Harris decided that Case Records would add medical management to the mix of cases.

Experts discussing the case would know the diagnosis in advance but would have to figure out the correct plan to treat an unusual presentation of a common disease or a rare or new disease. In 2020, 10 Case Records of patients with COVID-19 were published as physicians were concurrently figuring out how to treat the novel infection. The virtual CPCs on COVID-19 provided a powerful way to share experiences with physicians around the world.

"Medical school teaches you to think like a scientist, but the Case Records teach you to think like a doctor."

— Nancy Lee Harris, MD,
Case Records editor 2002-2014

I want to thank Dr. Ring for presenting this case, which teaches us some important lessons. One is that the entire team has responsibility for getting this right. Another is that preoperative verification needs to be done according to TJC protocols, and needs a surgeon to take the lead on this.

HARRY E. RUBASH, MD

I hope that none of you have to go through what my patient and I went through. I no longer see these protocalls as a burden. That is the lesson

DAVID C. RING, MD, PHD

CASE 34-1987

Though the clinicopathological conference discussions are no longer reported verbatim in the journal, they remain lively, vivid and distinctly human. In some instances the patient involved has made an appearance, further enriching the discussion.

After the needle biopsy results indicated a diagnosis of thymoma, pulse therapy with methylprednisolone sodium succinate was administered for 3 consecutive days, followed by oral prednisone. I would like to ask the patient how she felt after the first infusion of intravenous glucocorticoids.

MARGARET SETON, MD

I felt instantly better.
Not just "not worse", but better.
I felt as though I could have run up the 52 flights of stairs at the Prudential Center.

THE PATIENT

CASE 26-2013

I have a question for the patient. You have spoken about how happy you were with the care you received, but we are an academic institution, so what could we improve on?

MATTHIAS EIKERMANN, MD, PHD

I can't think of anything, except maybe the food.

THE PATIENT

CASE 11-2014

TYPES OF CASES

Forty Case Records showcasing the critical thinking of expert clinicians are now published each year. They may include:

A common presentation of an unusual disease, such as the 22-year-old college student who had pain and swelling of his hand, resulting from an uncommon skin infection that developed after he took up taxidermy as a new hobby.

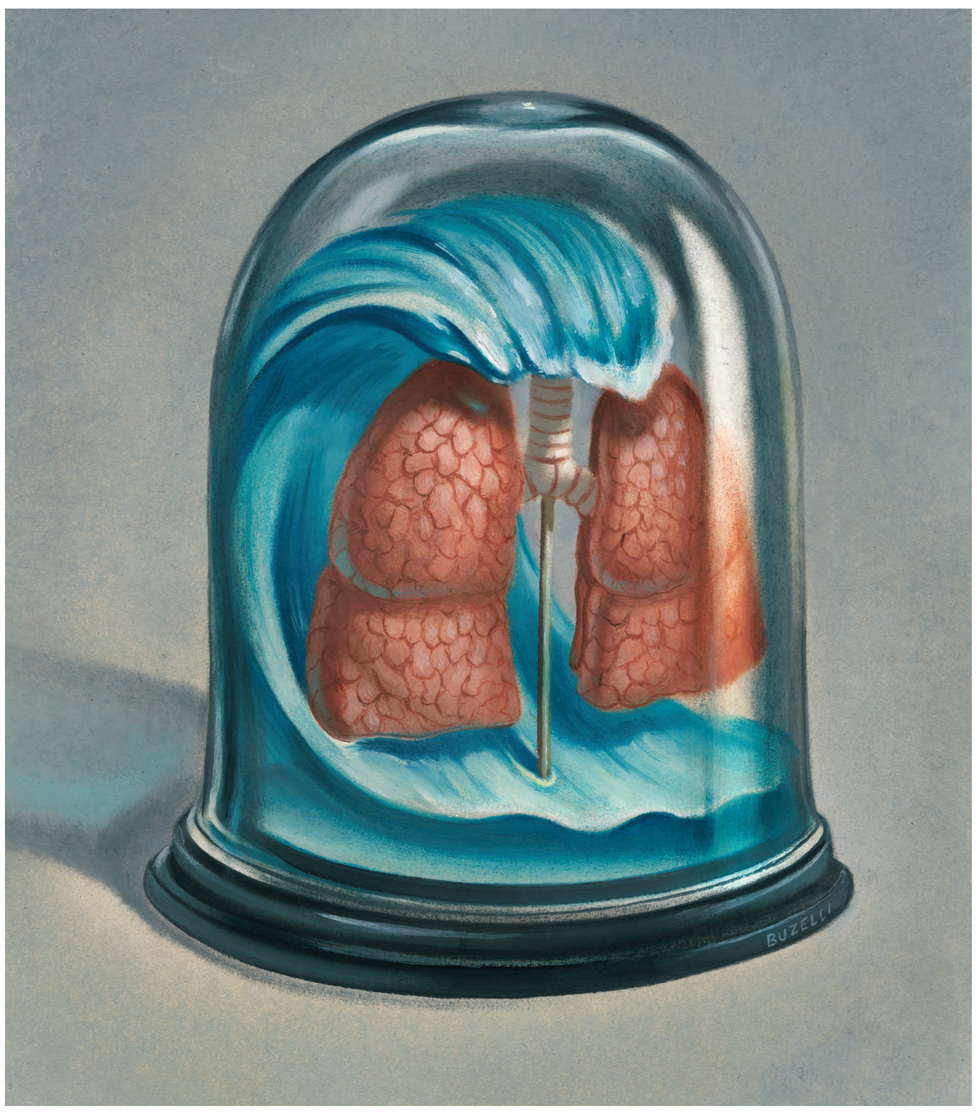
An unusual disease that mimics a common one, such as a patient with seizure disorder, which is relatively common, resulting from neurocysticercosis—an infection caused by a parasitic worm in the brain—which isn't a top-of-mind diagnosis in this country.

New syndromes or emerging diseases. The first case of mpox (initially called monkeypox) in the United States occurring during the 2022 outbreak was identified at MGH and was the subject of a Case Record. All traditional tests done on the 31-year-old patient were negative; an astute clinician made the diagnosis—confirmed by a public health laboratory—by noting the lesions' resemblance to a pox virus.

A new ultra-rare disease. MGH hematologist David Sykes, MD, presented a patient with an unusual constellation of clinical conditions, including an excess of red blood cells and acute kidney failure. Sykes had no idea what was wrong with the patient and invited the global audience of readers to contact him if they had treated a similar patient. A few did, and together the physicians discovered the novel disease called TEMPI syndrome.

A very unusual case, such as the 18-year-old professional athlete who, while eating a sandwich, accidently swallowed a toothpick that perforated his sigmoid colon and caused a fistula to the iliac artery; doctors at three different hospitals couldn't find the cause of the athlete's abdominal pain.

A hot topic, such as the 17-year-old girl who was swept up by a tsunami that struck the Indonesian coast in 2005. She developed pneumonia with lung and brain abscesses after nearly drowning. The CPC describing the first-ever case of "tsunami lung" was presented via teleconference by MGH physicians who were taking care of the girl aboard the U.S. Naval hospital ship Mercy. MGH physicians on the ground during the cholera outbreak in Haiti in 2011 also presented a CPC from there.



THE CASE OF THE EYE TRANSFIXED

The 27-year-old was in agony. While maintaining his yard, the weed whacker he was using had kicked up a long nail that shot into his right eye. His doctors worried that the embedded nail might be the only thing preventing a cascade of brain damage, and pulling it out could cause a life-threatening hemorrhage. Advanced CT imaging couldn't reveal whether the nail had punctured the internal carotid artery.

One option, bringing its own catastrophic risks, was to drill into the skull and also make an incision in the neck, providing access for emergency repairs. Finally, though, with two surgeons standing ready to make those cuts, a third gently pulled out the nail—and nothing happened. Even the eye was saved. With a course of antibiotics to prevent infection, the patient was released from the hospital, and within eight weeks, his vision was back to normal.

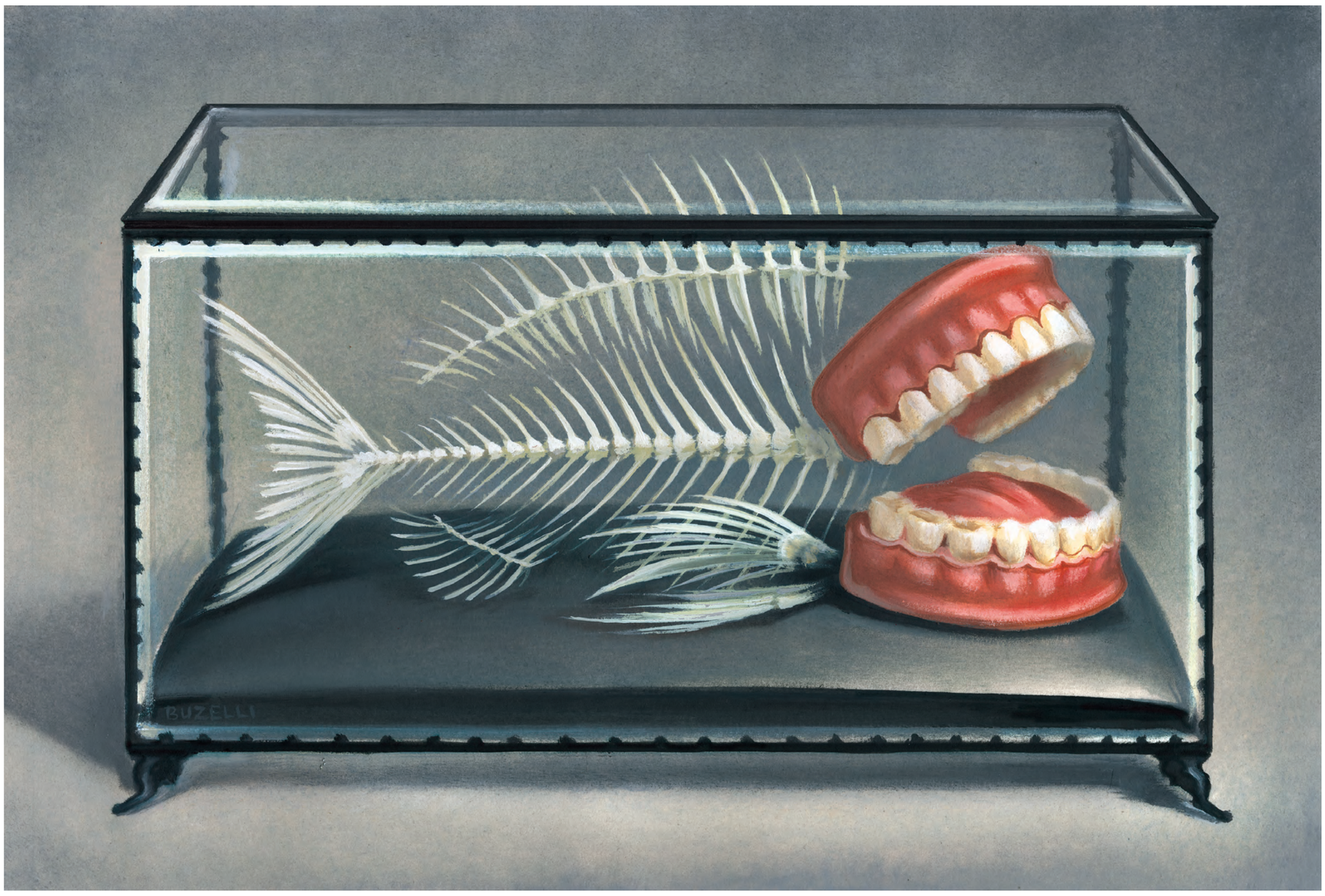
THE CASE OF TOO MUCH LICORICE

A 54-year-old man collapsed in a fast-food restaurant, and it took a combination of injections, intravenous medications and electrical shocks to restart his heart. By the time he arrived at MGH, his heart rate was rapid and irregular, and his blood pressure was high.

Lab results showed a severe shortage of blood potassium, vital for proper heart functioning. The patient had no personal or family history of cardiac symptoms but had previously used heroin and had an untreated hepatitis C infection. Further tests, which ruled out other causes, led physicians to suspect that his low potassium levels were the result of a drug or food.

According to family members, the man subsisted on several bags of candy every day, and three weeks earlier had switched to licorice, an excess of which can cause heart problems.

As his organs shut down, the patient produced less and less urine, and his family declined further treatment. He died 32 hours after he arrived.



THE CASE OF THE VILLAINOUS FISH BONE

A 37-year-old New Englander who had lived in Vietnam had experienced “rolling spasms” in his chest and, later, fevers, chills and body aches. Tests were negative for dengue, malaria, HIV and other diseases; an ultrasound showed a slightly enlarged liver and spleen. Further tests revealed bacteria in the blood and a CT scan showed possible lesions in the liver. A consulting MGH physician suspected a liver abscess—and the mortality rate for those may be as high as 12%. He urged transfer to MGH, where CT images revealed a “hyperdense” foreign body in the pancreas: a fish bone. Reaching the bone risked damaging vital organs, but a surgeon managed to get in, cut the bone in two and safely extract both pieces.

THE CASE OF THE REMEDY GONE WRONG

A 76-year-old woman was suffering abdominal pain and constipation, had lost weight, was disoriented and had considered suicide. A history of domestic abuse led to a diagnosis of post-traumatic stress disorder, and anti-anxiety medication helped.

But the search for an explanation of her abdominal pain hit one dead end after another. Finally, because her urinary porphyrin levels were high, and other test results pointed toward possible acute intermittent porphyria, she received four days of treatment for that condition. Yet the symptoms she had experienced, they saw, could also signify lead poisoning. It turned out that the patient's daughter, who lived in India, had been providing dietary supplements thought to include traditional Ayurvedic medicines—which often contain lead, arsenic and mercury. Further testing revealed blood lead levels more than 20 times higher than normal. She received what is called chelation therapy, which removes heavy metals from the body. Six weeks later, although her blood lead levels remained high, her abdominal pain was gone, she was eating better and her thinking had improved.

Isn't it a little unusual to have the spleen so unimportant a finding? They were not at all sure about enlargement of this organ.

DR. JONES

CASE 13261, 1944

I think there are a great many cases where we do not find it in life. We are always pleased when we do, because it helps the diagnosis. I have failed to find it a great many times.

DR. CABOT

The family was very disappointed to have seen defeat snatched from the jaws of victory and decided that no further treatment should be given. In the context of the poor prognosis for the child we fully supported that decision, although not necessarily agreeing with it. However, Mother Nature works in mysterious fashions. Seven months have elapsed, and he remains in the very best of health except for bilateral facial palsies.

JOHN TRUMAN, MD

CASE 40-1987

I may be "all wet," but if this is not neurofibromatosis I shall be greatly surprised.

FULLER ALBRIGHT, MD

CASE 30401-1944

It's a description of a headache that very few other patients give, according to my experience. The pain throbs, pounds and pushes — they use many forceful words to describe its severe exacerbations.

MARIAN ROPES, MD

CASE 40-1962

This case was puzzling, and it was difficult to understand completely the nature of the patient's problem during the course in the hospital.

ELIZABETH C. DOOLING, MD

CASE 35-1981

Like other difficult conversations in medicine—such as those in which bad news is delivered or sexual history is obtained—conversations about autopsy must be approached in a manner that is learned and practiced.

KATHY TRAN, MD

CASE 23-2020

A CONTINUED WORLDWIDE INFLUENCE

Patient case studies continue to be used extensively as a teaching tool in medical schools and for the continuing education of physicians. Arguably every medical journal has mimicked the Case Records, challenging readers to make the diagnosis. The popular press, such as the *New York Times* and the *Washington Post*, also publish stories of patients with unusual disorders that flummox doctors until one finally lands on the right diagnosis and treatment.

The technologies physicians use today to make diagnoses are better than ever. But the challenge for physicians now is to synthesize much more data, including many red herrings, to make sense of what is wrong with the patient.

IN 2022, CASE RECORDS WERE VIEWED APPROXIMATELY

1.5 MILLION TIMES

BY READERS FROM

229 COUNTRIES

THE MOST POPULAR CASE RECORD PUBLISHED THAT YEAR HAD MORE THAN

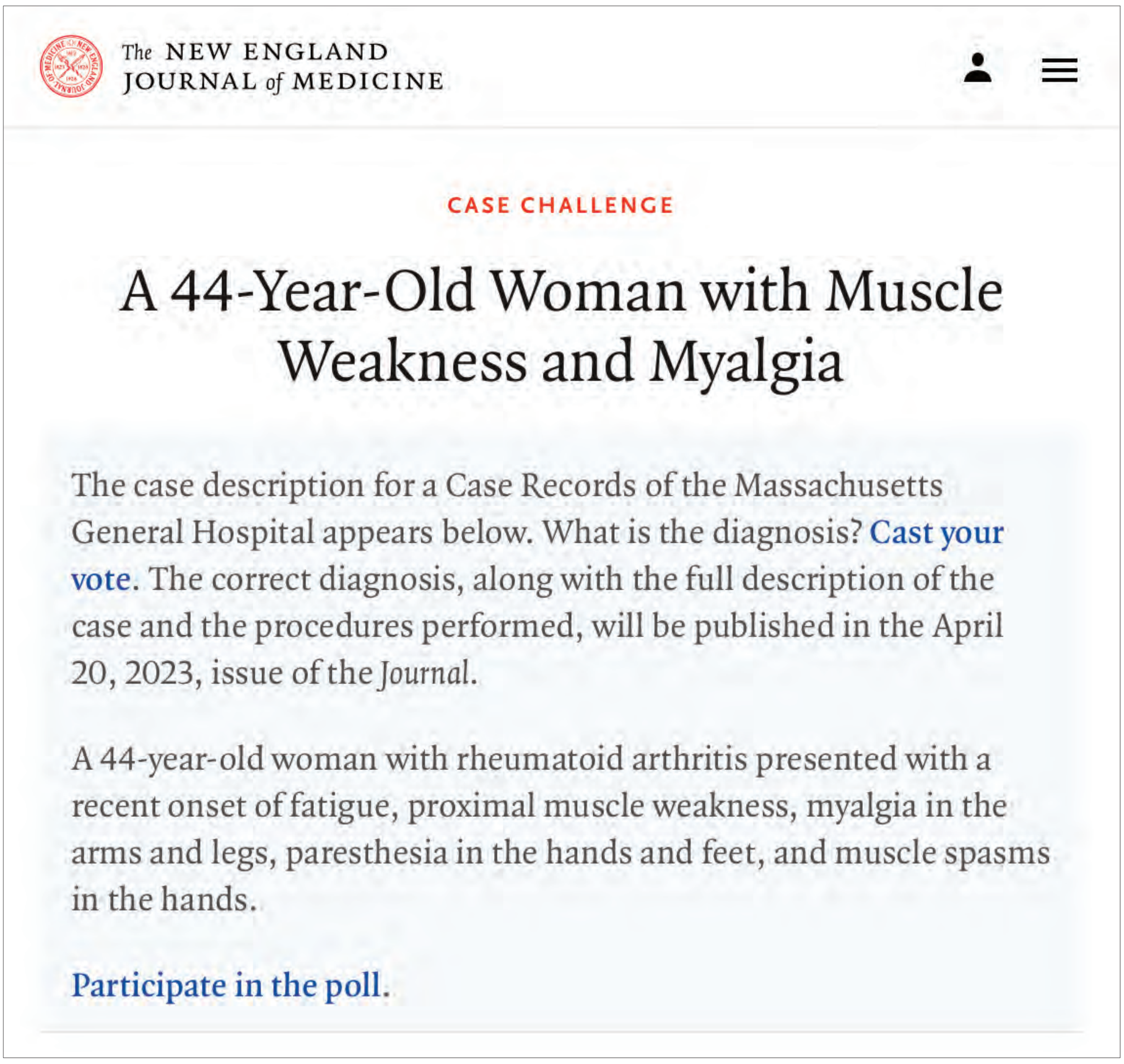
235,000 VIEWS

ADAPTING TO A NEW LEARNING STYLE

Many younger doctors have never held a paper copy of the *New England Journal of Medicine*, so Case Records has adapted to online learning. A quiz called Case Challenge invites *NEJM* readers to make a diagnosis on an upcoming patient case. Readers choose from among six possible diagnoses, and once they enter their answer, they can see how other readers have voted. A week later, they can read the Case Record to find out whether they were right or learn why they were wrong.

The next iteration of Case Records will likely become more multimedia and interactive.

What will never change, however, is the appetite for clinicians to learn from the discussion of real patient cases. "Case Records and the case method teaches fundamental diagnostic and management skills while keeping people engaged by the really unusual and fascinating medical cases," says Rosenberg.



ILLUSTRATING THE CASE RECORDS

When Chris Buzelli was a child, his single mother brought him with her to nursing school classes. As her anatomy instructor drew pictures on the chalkboard, Buzelli followed along with his crayons. Years later, when he was an illustration student at the Rhode Island School of Design, he frequented the Nature Lab, a trove of natural history specimens available to examine and sketch. So when Proto magazine contacted Buzelli about illustrating a story about the Case Records of the MGH, he felt right at home with the assignment.

The challenge, however, lay in portraying often-graphic conditions for the nonmedical public. Given a list of Case Records to choose from, Buzelli decided to encapsulate cases within display cases and bell jars. "It's always the challenge in illustration to communicate a story's themes but leave some mystery," he says.

Buzelli's work has also appeared in *The New York Times*, *Scientific American* and *Rolling Stone*, among others.