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The X-Rays of Patient X

When I was in medical school, I first became acquainted with the term “index patient.” This was the first patient who we knew had a specific disease. When we knew the disease and were searching for this first patient, we termed the subject “patient Z.” When we knew the patient and started a treatment regimen with unknown results, we called the subject “patient X.” In all these situations, imaging played, and still plays, a major role in the search for the unknown.

So why use the term “X” for an unknown response? We have Rene Descartes to blame. Descartes was the first scientist to use *x*, which he defined as the unknown in a formula.

When Roentgen discovered a new wave, he did not know its origin and hence termed it “x-ray”—a description we use to this day. For the 400 years since Descartes, X has been used to describe any unknown. X has even worked its way into popular culture for objects or characters of which something remains unknown—X

Men, Xbox, and *The X-Files* paranormal TV show. Pepsi added an extra x to its Maxx brand to imply something secret and special about its formula. Elon Musk named his rocket company Space X and his third Tesla automobile the Model X, to imply there was something hidden and special in his designs.

When I finished medical school, I naively thought that I was taught all the diseases that existed. Maybe I did not know everything about them, but I knew the names and basic pathology of our compendium of medical disorders.

How wrong I was. Almost immediately after graduation, a new, tragic disease was described—acquired immunodeficiency syndrome (AIDS). Much of the early research into AIDS involved the search for the first person affected by this disease. If we could find the first sufferer, we could thoroughly examine the patient and try to determine the pathophysiology.

In the intervening decades, a new pathogen seems to percolate to the surface every 2 to 3 years—West

Nile, Hanta virus, Ebola, SARS (severe acute respiratory syndrome), bovine spongiform encephalopathy, MERS (Middle East respiratory syndrome). We search for patient X for each of these diseases, and we often use imaging studies to determine what the exact pathophysiology is. We “CT” these patients, use MR, and even use x-rays to try to classify their disease. We search for similarities with other diseases and use this observational codification to help classify these disorders.

Hence, radiologists play a major role in the search for the disease and effects of treatment on patient X—as we do for all our patients. Our role, as is often our fate, is unsung. We never or rarely make the headlines; our role in the disease description is often regulated to the imaging literature rather than the more widely read narrative manuscripts. The front-facing physicians are by definition the face of the medical profession. They show the scans, and they often just parrot our observations and interpretations. We are the unknown. We are physician X.

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