Sutton's law, Phaeochromocytomas and Zebras

In the last column we featured a professor of surgery, a Franciscan monk, a Nigerian author and a professor of medicine. In this following column we have a bank robber, another professor of medicine, a pathologist and a surgeon.

On this same subject of clinical reasoning, I would like to believe that we follow sequences and strive to be logical in our investigations, bloods tests and imaging. Appropriate tests are ordered to confirm or refute the hypotheses that we have formed from the patient's history and examination. Nevertheless, if we let the patient out of our hands into the medical market place, they may receive a whole battery of tests and scans in the close-your-eyes-and-tick-all-the-boxes system. This umbrella or shotgun approach is often done because of fear of litigation and also to protect the doctor's reputation in case a diagnosis is missed.

The temptation to over investigate arises when most of the symptoms fit into one diagnosis but one symptom or sign does not fit the primary hypothesis. One can then spend a considerable amount of time and money searching for the cause of the outlier. It may, on the one hand, be the key to a secondary diagnosis or, on the other hand, a red herring and one ends up looking at night in a coal cellar for a black cat that is not there.

In act two of this production, the bank robber Willie Sutton takes the stage. He reputedly replied to a reporter's enquiry as to why he robbed banks by saying "because that is where the money is". In medicine, if we follow Sutton's thought process then we should only be using those tests that, from our primary hypotheses, are relevant to the case in question.

Instead of Sutton's system of concentrating on the likely diagnosis, we now tend to scan the patient "to be on the safe side". This leads to a great many normal results. For instance the percentage of CT brain scans done for headaches that turn out to be positive (that is showing something wrong with the brain) is between 6 and 13 percent. So William Sutton would be wise to rob the banks that contained the doctors' bank accounts and not the patients' accounts.

The scene now shifts to 1991 when a pathologist called Horton A Johnson from Columbia University in New York enters the arena. He wrote a landmark paper in the Journal of the American Medical Association called *Diminishing Returns on the Road to Diagnostic Certainty.* As one approaches diagnostic certainty, he says, the useful information returned by diagnostic tests approaches zero. After our first line of investigations there is not much information gained by carrying on to a second or third session of blood tests or imaging. One then goes into "diagnostic overkill" and the expenses increase. This is not without its own problems because of "incidentalomas" that send one off on another goose chase of investigations. These investigations in themselves may then lead to further side effects or complications, which has been called the Ulysses Syndrome. This was first described in the Canadian Medical Journal in 1972 by Dr Mercer Rang, a surgeon from Toronto. Ulysses fought in the Trojan war and afterwards it took him ten years to get home (which is even longer to get home than in Johannesburg). On his journey home he had many dangerous adventures and patients with Ulysses syndrome may have similar journeys through the technology of modern hospitals with inappropriate or unnecessary investigations.

Papers from 1972 and 1991 are not exactly hot off the press but they have stood the test of time. One of the great tests that we were allowed in the past was "the test of time". Many symptoms and conditions cure themselves or fade away over time but the art of waiting has almost disappeared. The clients want to know the final solution now. Nature and the natural course of illness must wait for another day.

Now entering the fray for the final act is Theodore Woodward, a professor of medicine at the University of Maryland. He comes in on the side of Willie Sutton and while teaching his students on the skills of diagnosis says "when you hear hoof beats, think horses not zebras". This does not necessarily apply if you practise medicine in the Kruger National Park or Umfolozi Game Reserve. As students we often become imprinted with those really fascinating explanations of rare illnesses such as Addison's disease and phaeochromocytomas. They explain the physiology and causation of illness in an eloquent and understandable way and are called fascinomas.

All my practice life I have been waiting for a patient with hypertension, caused by phaeochromocytoma, to enter my consulting room. To me it has now become a mythoma.

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