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Dr. Geoffrey Norman, Michael G.
DeGroote School of Medicine at
McMaster University

Experience counts

Physicians' acquired problem-solving methods have significant impact in the medical education field

By: Hayley Millard

You're in need of a physician and deciding between two potential candidates. One just finished medical school last year and graduated at the top of the class. The other has been a practicing physician for 10 years now, but graduated only in the top half of the class. Who do you pick?

This year's recipient of the Karolinska Institutet Prize, Dr. Geoffrey Norman of McMaster University's Michael G. DeGroote School of Medicine, will tell you the more experienced physician is the better choice.

"Most people would naturally choose a more experienced doctor," says Norman. "They know that experience matters, but they don't know why it matters."

Norman began investigating the strategies of clinical reasoning more than 30 years ago. His extensive findings now help us understand how physicians problem-solve in arriving at their diagnoses, and have earned him the Karolinska Institutet Prize in Stockholm Sweden on October 28, 2008.

The prize is only awarded every two or three years to recognize outstanding research that contributes to long-term improvements in medical training.

Norman's work observed how physicians generate multiple diagnostic hypotheses when faced with a new ailing patient, and studied how they subconsciously retrieved information that confirmed or refuted each hypothesis to make a final diagnosis.

As physicians evaluate each hypothesis, they trigger memory patterns. But Norman found these patterns differ between expert and novice physicians.

"Most people would naturally choose a more experienced doctor," says Norman. "They know that experience matters, but they don't know why it matters."

"A physician fresh out of medical school has not yet acquired non-analytical competencies for making a diagnosis," says Norman. "Largely, they're relying on formal knowledge acquired through prior years of scientific facts retained through their education."

Consider a parallel example, he says. Many people can look at a cat beside a dog and know with certainty which is which. The ability to quickly and accurately make that non-analytical, subconscious decision comes from exposure to quite a few cats and dogs.

Now, disregard experience-based knowledge, and consider relying on classification rules to formally differentiate the cat from the dog. Most people can't easily recall biological differences between a cat and a dog. Both animals have fur, four legs and a tail. But few people have the formal knowledge to realize only their eyes and claws are different - a cat's pupils dilate into oval or diamond shapes and a dog's does not, and cats' claws retract while dogs' claws don't. Still, they can tell them apart.

Norman's research applies the same reasoning to medical diagnostics. As new physicians eventually add to their formal knowledge with clinical experience after medical school, a quicker recall pattern is triggered by experience-based learning and leads to more timely and accurate diagnosis.

As Norman says, "A physician's true competence only comes with years of experience."

Drs. Lee Brooks and Scott Watter, Department of Psychology, Neuroscience and Behavior at McMaster University have also been involved in Norman's research, which has received funding from the Natural Sciences and Engineering Research Council, the Medical Council of Canada, the Social Sciences and Humanities Research Council and the Canadian Institute of Health Research for more than 30 years.



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