

## **Evidence-based medicine is changing medical practice**

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**By Dr. Gordon Guyatt**

**(Spectator headline: McMaster a leader in assessing risk accurately)**

“After a decade of encouraging women who have gone through menopause to take hormone replacement therapy, it’s unpleasant telling them that they’ve been taking a dangerous drug.”

The speaker, a family doctor I met at a medical conference, was uncomfortable. She had followed expert advice, and told her patients that they could reduce their risk of heart attacks by using the hormone replacement therapy (HRT).

A new study had shown that HRT does not reduce risks of heart attack, and may even increase the risk. Furthermore, the study found that HRT increases breast cancer risk.

“If the experts making the recommendations had understood the principles of evidence-based medicine,” says Dr. Brian Haynes, Professor of Medicine at McMaster University, “the family doctor would not have got herself, and her patients, in so much trouble.”

Traditionally, doctors have not been taught how to understand original research articles. That means they could not independently decide whether evidence was strong or weak. They were at the mercy of experts, or pharmaceutical representatives.

Perhaps even worse, doctors had limited training in helping patients weigh up the benefits, and risks, of alternative therapies.

Many research studies had suggested that HRT could lower cardiovascular risk. But the research had used weak study designs.

So what is a “weak study design”? Consider a study of whether hospitals keep people alive, or kill them. The study shows that people are more likely to die in hospital than in the community. So, hospitals are hazardous, right?

We would laugh at that conclusion. More people die in hospitals not because they are risky places, but because people in hospital are sicker than people in the community.

This problem plagues all “observational” studies. If people taking a treatment are healthier than people who don’t, we may falsely attribute life-saving properties to that treatment.

How do researchers solve this problem? They decide who gets treatment by, in effect, flipping a coin. This “random allocation” makes sure that people who get treatment are, at the start of a study, no healthier or sicker than those who don’t.

This explains the HRT results. In earlier, observational studies, women taking HRT were at lower risk of cardiovascular disease than women who didn’t take HRT. They may have exercised more, had less stress, or been wealthier, all factors associated with better health outcomes.

So, it looked as if HRT reduced heart attacks when, in reality, women taking HRT were destined to have fewer cardiovascular events whether or not they took HRT. The randomized trials revealed the real situation.

There are other examples of doctors going wrong because they didn’t respect the principles of evidence-based medicine (EBM).

Othopaedic surgeons were sure that they could help patients with painful osteoarthritis of the knee by, in effect, washing the knee out. They inserted a surgical instrument, an arthroscope, into the knee and “washed out” chemicals they believed caused the pain.

In 2002, researchers reported the results of a randomized trial in which patients received the real surgery or “mock” surgery in which surgeons made a cut in the skin, but never used the arthroscope. The result? No difference in pain at any time during two years of follow-up.

How could doctors have gone so wrong? They underestimated “placebo” effects. We often feel better when we receive a treatment we believe is helpful, even if there is no real effect.

McMaster has been a world leader in helping understand such issues. In

fact, McMaster may be the single institution that contributed most to EBM.

Dr. Haynes, for instance, has done more than any other researcher in the world to get the evidence to doctors in a clear, usable way.

“EBM still faces big challenges,” Dr. Haynes says. “We need to do a better job of helping doctors understand EBM principles, and making sure they have the best evidence at their fingertips. Expert recommendations must reflect the best evidence, and consider patients’ values and preferences.”

Other health workers can also benefit from understanding and applying evidence-based principles. Nursing, for instance, has its own share of myths. For instance, randomized trials have shown that the widespread practice of shaving patients before surgery increases, rather than decreases, wound infections.

McMaster Professor of Nursing Alba DiCenso has played a key role in establishing evidence-based nursing. Her soon to be released text book will provide the ideal guide for nurses interested in using evidence to guide their practice.

McMaster has also been a key participant in an international effort, the Cochrane Collaboration. The Collaboration’s goal is to bring high-quality evidence summaries to doctors and patients. You can join the Cochrane Consumer Network through their website, <http://www.cochraneconsumer.com/>

As they better understand EBM, experts and doctors will create fewer problem stories like HRT and arthroscopic arthritis surgery. And, as a patient, you will receive more accurate information about the benefits and risks of the treatments that medicine has to offer.