When 50 Percent Is Not the Same as a Coin Toss: Study Examines Decisions Made Based on Statistics

When a diner orders escargot at a French restaurant and is shocked to discover a plate covered with snails, she can always send them back. But when chemotherapy is on the menu, she can only choose once. And many times, patients do not understand what is really on the menu, according to a study that shows that simple variations in how doctors present survival data can lead to large differences in the perceived benefits of adjuvant chemotherapy for breast cancer. This misperception of risk can change whether a patient chooses to undergo chemotherapy, and that should be a cause for alarm, the authors concluded.

“The bottom line is that a very simple statistical manipulation can have a rather dramatic impact on the decisions that people make,” said Jamie Studts, Ph.D., a clinical psychologist at the University of Louisville and coauthor of the study, which appeared in the December 1, 2003, issue of the Journal of Clinical Oncology.

Studs and Celia Chao, M.D., a surgical oncologist at the University of Texas Medical Branch at Galveston, designed the study to test how the four most common methods of presenting survival data (relative risk reduction, absolute risk reduction, absolute survival benefit, and number needed to treat) influence decision-making in the adjuvant chemotherapy setting.

“I know that when patients think about whether they should take adjuvant therapy, they are told risk—they are given some percentage,” said Chao. “But when I talk to my patients about their decision either before or later on, I don’t really get a sense that they understand, most of them, why they choose to go on to chemo or not.”

Oncologist Eric Winer, M.D., of the Dana-Farber Cancer Institute, Boston, likens the process to sitting down to a meal in a restaurant in a foreign country where you don’t speak the language.

“One thing that a doctor can do is say, ‘Here are the choices: a, b or c, pick whatever you want,’ which is of course not very helpful,” said Winer. “The patient doesn’t understand the restaurant, doesn’t understand the food, and it’s really sort of a random choice. Or the doctor can say, ‘This is what I would do if it were me,’ which is a little bit like saying ‘I like chicken, therefore you must like chicken.’ What you really want to have happen in this situation is that you want the doctor or nurse to sit with you and try to understand something about who you are and what your preferences are in much the same way that in the restaurant, ideally the waiter asks what you like to eat and makes recommendations based on that.”

To address how much people understand about cancer statistics, Chao and Studts designed a pilot study that used 203 first- and second-year medical students as subjects. The students were presented a hypothetical situation in which they were asked to advise their mother whether to take chemotherapy after mastectomy in which the tumor had not spread to the lymph nodes. The students were given clinical descriptions and one of four statistical variations of the same expected survival data. After they had given their advice, they were presented all four descriptions of the data and asked whether they would make the same recommendation.

The study showed that even in a study population of medical students, who might be expected to be more comfortable with statistics than the average person, the presentation style made a major impact. Participants were twice as likely to endorse chemotherapy when presented only relative risk figures (51%) compared with absolute risk figures (25%). When presented all four scenarios, the participants reported being confused and less confident of their decision.

Chao points out that, for example, a 50% relative risk reduction from taking tamoxifen can sound impressive until you learn that you have a 92% chance of never getting breast cancer anyway, and if you take tamoxifen you increase that to 96%.

“They sound very different,” said Chao. “That’s the point. And if you try to explain it too many different ways, you can confuse people.”

The authors concluded that the most effective and least confusing way of presenting the data was absolute risk reduction and that doctors should use charts and other visual aids to help ensure that patients understand the data.

“As a research group we had to sit down and recalculate these estimates several times to make sure we were getting it right,” said Studts. “In terms of translating these numbers into ‘real’ numbers that people can understand, we were reflecting on if this is difficult for us, it has to be a bit of a quagmire for patients to understand.”

“Physicians generally don’t get a lot of training on communication in medical school,” agreed Marjorie Stanzler, executive director of the Schwartz Center, a Boston-based nonprofit organization dedicated to improving doctor–patient communication. “But this is changing because people are realizing how important it is.”

Stanzler points out that the Accreditation Council for Graduate Medical Education has now adopted “interpersonal and communication skills” as one of six core competencies and is now requiring that communications skills be a key component of graduate medical education.
There are very few existing models for communications training, said Stanzler, and that’s why the Schwartz Center has issued a call for proposals for innovative new methods of teaching effective communications skills that can be replicated across the country.

One such communication tool is already being developed by Neal Meropol, M.D., a medical oncologist at Fox Chase Cancer Center, Philadelphia.

“Physicians need to be more aware of the fact that how information is framed, even if the facts are accurate, can impact patient perceptions and decision-making,” he said. “We need to realize that we should not be spin doctors.”

Instead, Meropol said that doctors should spend more time learning how patients want information presented and how the patient’s values inform the decision-making process.

“Physicians need training in how patients interpret questions and to learn how to better understand the underlying meaning of patient responses,” he said.

Meropol’s research has shown that patients and physicians can have radically different views of what was discussed during the patient consultation. One study, published in the July 2003 issue of the *Journal of Clinical Oncology*, showed that physician expectations of potential risks and benefits of experimental therapy were quite different from patient expectations. Patients reported a higher expectation of benefit as well as a higher potential for harm than did physicians.

“We also asked patients and doctors what was discussed, and patients tended to respond that they had not talked about quality of life, whereas doctors said this had been discussed. This result did represent a concern with us,” Meropol said.

To address these issues, Meropol and his colleagues developed a computer-based tool designed to help patients prepare for a physician consultation and to help physicians gain a better understanding of patient preferences. The goal of the multicenter project, which is being funded by the National Institutes of Health, is to determine whether a computer-based intervention can improve doctor–patient communication and patient satisfaction. The ultimate goal, he said, is to develop a tool that can one day become a routine part of patient care—not just for cancer patients, but for all patients.

Physicians also need to remember that every patient is different, and what may seem like an uninformed or irrational decision may in fact be carefully thought out, said Winer. “One percent benefit may seem very, very small, but to someone who is facing the possibility that her cancer could come back, 1% in some situations may be enough to make her decide she is going to go through a difficult course of therapy.”

—Karyn Hede