Hocus-bogus

What research can be believed?

By Heather Z. Hutchins

Almost every day we hear about new medical studies. A team of medical researchers just completed their research, which indicates that coffee (or sodium, or eggs) can be hazardous to your health. This in itself is not a problem, until next year, when another study reports that some or all of those things are good for you in moderation.

"Observational study claims fail to replicate [approximately] 95 percent of the time...This has been known or suspected since 1988," according to a 2009 presentation by the National Institute of Statistical Sciences (NISS). 1

Given this information about some types of medical studies, what can you believe? How can you teach medical assisting students to evaluate medical studies so that they can accurately convey the correct information to patients?

The grand illusion

"Always be a little skeptical about anything you hear in the media until you can take the time to investigate and evaluate the data," recommends Neeru Jayanthi, MD, associate professor in the departments of family medicine and orthopedic surgery and rehabilitation at the Stritch School of Medicine at Loyola University in Maywood, Ill.

"No one should immediately change their behavior based on just one medical study," he adds.

"I tell medical consumers and medical practitioners alike to beware of what I call 'voodoo statistics' and 'trust me science,'" says S. Stanley Young, PhD, assistant director of bioinformatics for the NISS in Research Triangle Park, N.C. "If a study tests many questions to make a few claims based on just one data set, that's voodoo statistics. The researchers could be cooking the numbers to make them come out the way they desire."

"And, if that data set is not available to the public or to a trusted third-party organization (such as the Food and Drug Administration [FDA] or another governmental agency), that's 'trust me science,' because the researchers are asking us to trust their conclusions without being able to check them," he says.

"The evaluation of observational studies is a huge issue right now in the scientific community, because even the savvy editors of medical publications are having difficulty figuring out what medical research can be believed," Dr. Young adds.

Eye on the tricks

So, if the editors of medical journals have difficulty determining what to believe, how can educators look at medical research data in a useful way?

A good study can be reproduced, has been published in a reliable peer-reviewed journal, has been presented as an abstract at a medical conference, and is not described as "preliminary findings," according to Dr. Jayanthi.

"If any of these parts are missing or you cannot find sufficient information about them, it should send up a yellow flag for you to be cautious about believing anything in the study," Dr. Jayanthi adds.

When evaluating sources on the Internet and in print, most medical professionals have their favorite trusted resources. For example, Dr. Jayanthi trusts UpToDate.com and MDconsult.com. Look for websites that clearly list the authors of the articles and the expertise of those authors. If the author is not a medical professional, make sure the website has medical professionals review and approve the content, as does WebMD.com.

John Harris, CMA (AAMA), CPT, medical assisting educator at the Medix School in Towson, Md., encourages his students to trust their instincts when evaluating information. He teaches students to begin with reputable publications such as the Journal of Nursing and the American Medical Association's Drug Evaluations.

"Most of all, I tell them to trust their own instincts about what they read or hear. Common sense is a useful tool when looking at medical information," Harris adds. "If something sounds too good to be true, it probably is."
Now you see it...

Approaching medical research in an organized fashion is helpful when questioning data. Taking the following five steps will help you make sense of medical data, according to Neeru Jayanthi, MD, associate professor at Loyola University Stritch School of Medicine in Maywood, Ill.:

1. Do some Internet research about the study.
2. Find out if the research was presented at a medical conference or published in a peer-reviewed medical journal.
3. Look at the size and breadth of the study. A larger study has a better chance of being statistically viable.
4. Compare the findings of the study to prior research. What were those earlier studies and what were their findings?
5. Find out who the lead investigator was. What are this person’s background, credentials, and reputation?

Sleight of brand

One difficulty with understanding medical research is cutting through any bias in the study or the media that reported it.

Bias can come from the researchers themselves, such as in cases where investigators are doing research to promote procedures that they already perform, according to Dr. Jayanthi. Bias can also come from the organization paying for the study.

There can also be a statistical bias—look at the information and how it’s designed,” he says. “The resulting findings need to be statistically significant—this means that the result isn’t just random or luck. For example, ‘A is 39 percent more effective than B’—this is more likely than chance alone.”

“The study should have a control group and be randomized. Look for a P value of less than 0.05—this means that the statistical probability is 95 percent that the change happened based on the treatment and not just by chance,” Dr. Jayanthi adds. The P value indicates how likely it is that a result in the research happened randomly. For example, a P value of .50 means that there is a 50 percent chance that the change happened randomly and not for the reason that the study suggests. The lower the P value, the more reliable the results.

A certain amount of bias is inherent in the publication process, according to Dr. Young. “The top journals are in relatively fierce competition,” he notes. “The editors are very bright and often have a point of view. They are human. They are more likely to publish articles that support their point of view. Referees for the articles are more likely to criticize papers that do not support their own points of view. Scientists are not saints.”

However, Dr. Young concludes, “In a well-conducted randomized controlled trial (RCT), there is essentially no bias. Randomization is one of the great statistical inventions of the last century.”

Secrets unveiled

The difficulty with reporting medical research, evaluating sources, and recognizing bias is that students may understand these things themselves, but they must learn how to convey this information to patients.

Cori Burns, CMA (AAMA), program director and medical assisting educator at Cosumnes River College in Sacramento, Calif., asks students to employ critical thinking skills before communicating with patients.

“I ask students to look at the language used in the report,” she explains. “Is the language inflammatory? That frequently indicates a bias on the part of the writer. I also ask students to consider who is paying for the research—the funding source. I suggest that they look into the background of the funding organization and figure out why the organization is paying for this particular research.”

Harris employs a two-step process to teach students to communicate with patients. First, he tells his students that they need to be informed and knowledgeable, and then that they need to reduce their language down to words that the average person can understand.

Hardy tells students to educate patients about new medical discoveries so that the patient and the entire healthcare team can work together.

Dr. Young believes that maintaining a keen skepticism is the only way to approach any medical research. “Many claims coming from observational studies were reported in the best journals, yet those claims failed to replicate when tested in randomized controlled trials,” he says. “For observational studies, it is reader beware.”

References