

Living with Gout: Preventing the Fire

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Medical research is designed to bring about a better understanding of disease and health. Scholars have appropriately invested dollars and time into advancing this science, and the medical education system works to ensure that physicians comprehend it. Most medical journals identify new discoveries in science and disseminate the information to physicians.

Unlike most articles in medical journals, in this issue of **The Green Journal**, Wortmann (1) addresses the transfer of science to the patient in the clinic, the so-called bench to bedside translation. He focuses on a relatively under-emphasized aspect of the science and art of medicine: patients' understanding of their disease and treatment. For patients and physicians to be effective collaborators in the process of health care, such understanding is essential. The physician must be an effective teacher and the patient must be an effective learner. Wortmann focuses on one of the most difficult challenges in education—the design of explanations that make material meaningful and useful to the learner. In this article, we are presented with what, on the surface, may appear to be a simplistic analogy. This example prompts us to consider what types of explanations a physician might use, and what learner characteristics can guide those explanations.

To develop and use analogies effectively, the physician, like all other teachers, must consider two factors: the content to be taught, and the prior experiences and abilities of the learner. These variables are emphasized by researchers in the field of education, who conceptualize learning as information processing. Prior knowledge is organized in the learner's memory and serves as a framework for assimilating new knowledge. The learner processes new information by inserting it into this framework. An analogy is an explicit comparison between two things in which their structural, functional, or causal similarities, and often their differences, are described (2). Analogies often compare or relate the new material to prior knowledge, facilitating the learners' integration of the new knowledge.

In Dr. Wortmann's example, the new content for the patient includes the inflammatory process of gout and the drugs for gout; the prior knowledge encompasses their knowledge of matches. By relating the drugs to matches, the patient can use a prior framework, the function of

matches, to integrate the new content into something that the patient already understands.

One area related to analogies that I find particularly intriguing is the concept of the advance organizer (3). An advance organizer is a verbal or visual representation of the content that links new material to the prior knowledge base of the learner. This "link" is presented in "advance" of the presentation of the new material, allowing prior learning to provide a scaffold for integrating new material. An analogy can be one type of an advance organizer.

Studies of this technique indicate that it is especially useful in helping learners master concepts that they can apply to new situations. For example, if medical students master the analogy of the matches for the subject of gout, they might apply similar analogies to other patient situations, such as other examples of inflammation and drug use. In addition, advance organizers may be useful when the material is particularly complex or difficult for the learner.

However, what appears to the teacher to be an excellent analogy does not ensure understanding, retention, or application of the content to life of the learner. One disappointing result from research on advance organizers indicates that these techniques may not be effective for all types of learning. For example, advance organizers may not help learners remember details of the explanation as well as they remember the conceptual framework (4). For example, a patient may remember that one drug puts out the fire, another makes the matches damp, and a third removes the matches from the body. However, the patient may not remember which drug does what. Such information retention may require other educational techniques, such as memorization, writing the purpose on the prescription bottle, or handing out a guide such as that shown in Table 1 of Wortmann's article.

A second caveat is that one person's effective analogy or advance organizer may not prove useful to another. Learner differences, such as a learner's prior knowledge and experiences, receptivity to the information, and preference for visual versus verbal learning, may influence the effectiveness of the analogy. One reason why Wortmann's analogy may be effective is its use of visual imagery. The patient may be able to visualize the match and the fire, the drug dampening the matches, and even the matches leaving the body. Recognizing that many learners benefit from visual representations can prompt us to develop additional visual analogies for that group of learners. In fact, drawing pictures, as many effective teachers do, may be a useful habit for us as physician-teachers. In so much of our teaching, physicians are ver-

Am J Med. 1998;105:549–550.

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bal rather than visual. Using visual representations may be especially important as we care for patients who come from different cultures, where prior learning, language, and conceptual frameworks may differ.

A third caveat to the use of analogies is that they may lead to misconceptions (5). Because an analogy may provide psychological comfort to learners by allowing them to understand more effectively, learners may hold too tightly to the analogy as the full explanation of the phenomenon being explained. This oversimplification may be less important to patient teaching, where our goal may be to provide a general understanding of a disease process, but it can be more important to medical students, who may carry the oversimplified analogy beyond its useful purpose.

I mention these limitations of analogies mainly to highlight the challenge of the educational process. By providing us with his analogy to explain gout to patients, Wortmann makes several useful contributions. First, he reminds us that our own knowledge as physicians may not be useful to patients until it can be related to something that patients understand. Second, he initiates a process of sharing educational techniques. Physicians desire

to teach their patients effectively, but patients differ. Therefore, our goal as physician-teachers should be to have many ways to explain. Physicians and other health care providers have likely developed many analogies that have helped patients understand and deal with their illnesses, yet we seldom share these techniques to assist one another in the enhancement of our role as physician-teachers. Perhaps the analogy of the matches can ignite that synergistic process.

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