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Lee E. Mortenson

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Senior Editor
Lee E. Mortenson, D.P.A.
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Tom Suzuki
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Design Assistant
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FROM THE EDITOR

Neural Networks: Re-Thinking Guidelines

by Lee E. Mortenson, D.P.A.

Whenever the topic of oncology guidelines appears, there are a number of knee jerk responses that immediately take place. These reactions are, on the whole, based upon the justifiable paranoia of the profession that bureaucracy will inhibit innovation and favor cost over quality.

The immediate responses go something like this: It is too expensive a proposition to do guidelines. Guidelines go quickly out of date, and the bureaucracy or the insurers will lock into a series of treatment plans that quickly becomes outmoded. The minor differences in treatment regimens reflect the institutional training and cooperative group relationships of oncologists and should not be tampered with. We can't write guidelines, because we don't have all the answers.

For the moment, let's suspend the rules as we know them. Imagine there is a computer into which you can put all the information you want on cancer patient treatment plans: their surgeries, radiation oncology, chemotherapy regimens, length of stay, and utilization review. And, let's say that this computer constantly mulls over the information that you provide, updating its responses on the basis of some preferred outcome you give it. You may choose to tell the computer, for example, that you want a list of those variables that appear important in providing the cancer patient with care that will maximize survival.

The computer thinks about what you have given it (i.e., data and instructions) and then says, "Okay, here are the 20 items out of the 1,500 you gave me that appear to vary with length of survival. Of these, half you can't change (demographic variables), but the other half you can do something about. If you do this kind of surgical procedure, followed by this drug combination, you will improve survival by an average of six months."

Let's say you take the computer's advice, and then provide it with the patient's outcome. The computer becomes smarter and continues to refine its judgments.

These kinds of computer systems exist now. They are called neural networks, and while one does not yet exist in oncology, there is a very popular one set up in your ICU unit and another one that is used by many companies in workmen's compensation cases. The network is technically feasible.

Now, how do you feel about guidelines? We have eliminated all the standard objections. Neural nets will be timely and immediately updated. There will be no need to worry about national peer review committees or debating the fine points of regimens. It is all at the fingertips of the admitting department—in your hands when you first see the patient.

Although neural nets may sound too good to be true, I have seen a couple of these in action recently, and I wouldn't be surprised to see more in oncology. Gives you the creeps, doesn't it? After all, it is kind of important who decides for which outcomes the networks will maximize! And what if the neural nets work? What will our reaction be then? ■