# Virtual Mentor

**MEDICAL EDUCATION**
**Teaching Physician Decision Making in a Technical Age**

David Segal, PhD, and Richard L. Fernandez, MD

Traditional medical school ethics curriculum introduces students to the concepts of patient autonomy, informed consent, and medical uncertainty, which are central to contemporary biomedical ethics and the doctor-patient relationship. New guidelines and training programs have been developed in medical education to improve patient-doctor communication and support patients' active role in the shared decision-making process, but there is limited evidence to support the effectiveness of these efforts in practice. While the students understand the theory of medical uncertainty in the basic science years, this theoretical understanding is often replaced in the clinical training years by a reluctance to reveal uncertainty that, they fear, may convey a lack of medical knowledge and confidence.

The standard medical ethics curriculum assumes that patients and physicians are autonomous actors within the limited confines of their individual bodies or biologic space. This biomedical domain, however, must now be expanded into a somato-psychosociocultural model to include electronic spaces such as virtual environments, social networks, collaborative networks, and intelligent agents. The decentralized, social collective worlds offered by new social networking technologies over a borderless Internet empower each user with shared and cooperative interactions that can heighten their individual autonomy. This new technological architecture defines an "electronic" space that must be considered along with the biological space interactions that impact an individual's ability to make their own decisions.

Collective sites such as PatientsLikeMe have shown that thousands of people are willing to share their medical records, healthcare experiences, and outcomes for the benefit of other patients, caregivers, physicians, researchers, and anyone else who can help make patients' lives better. This global collaboration provides patients with real-world data and real-life information that can impact their own health care decisions. The power of these new tools can reshape our minds. Did we really believe we could collaboratively build and inhabit virtual worlds all day, every day, and not have it affect our perspective?

The 21st-century medical school should integrate adaptive, simulation-based training into its curriculum to offer individual and team learners with the optimal mix of synchronous experiences and instruction to rapidly develop robust and effective decision-making skills and other complex cognitive processes to deal with uncertainty. These technological advances allow for continuous performance

measurement and assessment along with empirically validated instructional interventions.

Computer-based decision support tools are not meant to replace live medical instructors or health professionals but to display the complexities of each individual patient case and decision-making process. Medical education must provide experiential learning to help students gain skill in assisting patients to make decisions about their own health care. It is imperative that we minimize our students' fear of failure so they aren't afraid of thinking outside the box, even though that means possibly making mistakes. Allowing students to confront these experiences in a "low-stakes," virtual space gives them insight into the different modes of patient and physician decision making and builds their confidence in managing actual clinical encounters.

One such innovative online, case-based, adaptive-training solution is called MyCaseSpace. This virtual clinic has state-of-the-art simulation and intelligent-agents. It invites students to interact with open-ended, problem-solving case scenarios that have basic science and clinical outcomes. The optimal way to illustrate the consequences of decisions is to simulate the multiple outcomes for each decision made by doctor, patient, family, and other health care actors in the scenario. This adaptive training system integrates multiple sources of patient data to provide real-time, sophisticated, expert performance evaluation of the learner's knowledge, skills, and abilities. The system can also support the decision-making process by providing real-time risk- and cost-benefit information for each alternative outcome. The advanced display capabilities and intelligent agents provide real-time feedback, scenario modification, automated cueing, and synchronous collaborative decision-making strategies. Both the manner and context in which information is presented can alter the autonomous boundaries that influence the decision-making process. This solution has been successfully used to significantly improve both individual and team-based student and faculty development using interactive patient cases [1].

The following case conveys typical challenges of the patient-doctor relationship and respecting patient autonomy.

Mr. W. was admitted to an intensive care unit with chronic and progressive symptoms diagnosed as the result of a tumor. He had a small but real chance of leaving the hospital alive if he submitted to invasive treatment. But Mr. W. felt that he had suffered enough and requested supportive care only. Before making a final decision, though, Mr. W. asked to speak with his primary care physician, Dr. K. Dr. K. ignored Mr. W.'s decision for supportive care, strongly emphasizing the patient's small chance of recovery and his own personal belief that giving up was not acceptable. Dr. K. finally convinced Mr. W. to undergo the surgical procedure. Mr. W.'s surgeon, Dr. M, made sure that Mr. W. understood his options and the probabilities associated with them and then complied with Mr. W's request for supportive care of chemotherapy and pain management, without sharing his own opinion, which was that the patient was making a serious mistake. Dr. H., Mr. W's

internist, spent a considerable amount of time with Mr. W., exploring various alternative treatments and offering additional information about the likelihood of success, while recommending that the patient try a more aggressive therapy. After some in-depth conversation, Dr. H. realized that Mr. W. appeared to be well informed and confident in his decision, so he initiated a palliative care plan for the patient. Dr. L., the oncologist, explained Mr. W.'s condition and spent a considerable amount of time listening to Mr. W.'s personal views about his lifestyle, family, religious beliefs, and future goals. Dr. L. explained the condition and the prognosis for several different treatments and the expected goals for each therapy to Mr. W. After a pause, Dr. L. recommended the surgery and explained the benefits of this approach in terms of Mr. W.'s expressed life goals and in comparison with the other possible treatments. Mr. W. asked Dr. L. to elaborate on the technical aspects and adverse effects for each treatment option which Dr. L. gladly did. Mr. W. felt relieved that Dr. L. had taken the time to explain the condition and treatment choices so that he could fully understand what would happen and how it would affect his quality of life afterwards. Mr. W. was amazed that Dr. L. was interested in hearing his thoughts about his condition and that Dr. L. was willing to spend whatever time was needed to answer all of his questions. In the end, Mr. W. made the decision to undergo the surgical procedure with no reservations.

Delivering this case in an open-ended digital format allows the conversations between the patient and each doctor to change with each interaction, while being linked in real-time to the patient's physiological and mental indicators. The patient's ability to make an informed decision can be evaluated based on the change in patient physiological, mental, and communication indicators. This type of simulation can dramatically illustrate the manner in which the physician might engage in open dialogue and inform the patient about his or her condition and therapeutic possibilities and discuss how the patients' values and personal beliefs can impact the decision making process. The patient's condition can also change depending on the decisions he or she makes.

The challenge for our 21st century medical education curricula is to employ new tools that simulate experiential learning and combine clinical evidence and expert guidance with patient-based scenarios that demonstrate the complexity of shared patient-physician decision making.

**References**
1. Mycasespace. http://www.mycasespace.org/patientautonomy.html. Accessed August 3, 2009.

David Segal, PhD, is assistant professor in the College of Health and Public Affairs at the University of Central Florida in Orlando. He has taught health science courses for over 15 years. His current research focuses on the use of adaptive, collaborative, and synchronous gaming and simulation technologies to improve the learner's decision-making skills and performance assessment. Dr Segal has expertise in

medical informatics and dynamic visualization programming for online collaboration and decision support.

Richard L. Fernandez, MD, has worked in private practice in internal medicine for the past 21 years and has been the primary care physician investigator on multiple clinical drug trials. Dr. Fernandez has served on Drug Formulary, Chart Review, and Quality Assurance Boards, worked as an emergency room physician, and was director of the largest Humana HMO Center in Miami Dade County.

*The viewpoints expressed on this site are those of the authors and do not necessarily reflect the views and policies of the AMA.*