- 11 Resnick MD, Bearinger L, Blum R. Physician attitudes and approaches to the problems of youth. *Pediatr Ann* 1986;15:799-807.
- 12 Davis DA, Thomson MA, Oxman AD, et al. Changing physician performance: a systematic review of the effect of continuing medical education strategies. *JAMA* 1995;274:700-705.
- 13 Davis DA, Thomson MA, Oxman AD, et al. Evidence for the effectiveness of CME: a review of 50 randomized controlled trials. *IAMA* 1992;268:1111-1117.
- 14 Oxman AD, Thomson MA, Davis DA, et al. No magic bullets: a systematic review of 102 trials of interventions to improve professional practice. *Can Med Assoc J* 1995;153:1423-1431.
- 15 Owen JM. Program evaluation forms and approaches. St Leonards (Australia): Allen & Unwin; 1993.
- 16 Davis D, Fox R, eds. The physician as learner: linking research to practice. Chicago: American Medical Association; 1994.
- 17 Greene JC, Caracelli VJ, eds. Advances in mixed-method evaluation: the challenges and benefits of integrating diverse paradigms. San Francisco (CA): Jossey-Bass; 1997. New Directions for Evaluation No. 74.
- 18 Masters GN, McCurry D. Competency-based assessment in the professions. Canberra: Australian Government Publishing Service; 1990.
- 19 Norman GR, Neufeld VR, Walsh A, et al. Measuring physicians' performances by using simulated patients. *J Med Educ* 1985;60:925-934.
- 20 Woodward CA, McConvey GA, Neufeld V, et al. Measurement of physician performance by standardized patients: refining techniques for undetected entry in physicians' offices. *Med Care* 1985;23:1019-1027.
- 21 Rosen D. The adolescent interview project. In: Johnson J, ed. Adolescent medicine residency training resources. Elk Grove Village (IL): American Academy of Pediatrics; 1995:1-15.

- 22 Royal Australian College of General Practitioners college examination handbook for candidates 1996. South Melbourne: Royal Australian College of General Practitioners; 1996.
- 23 Hays RB, van der Vleuten C, Fabb WE, et al. Longitudinal reliability of the Royal Australian College of General Practitioners certification examination. *Med Educ* 1995;29:317-321.
- 24 Bridges-Webb C, Britt H, Miles DA, et al. Morbidity and treatment in general practice in Australia 1990-1991. Med J Aust 1992;157:S1-S57.
- 25 The general practices profile study: a national survey of Australian general practices. Clifton Hill (Australia): Campbell Research & Consulting; 1997.
- 26 Knowles M. *The adult learner: a neglected species.* Houston (TX): Gulf Publishing Company; 1990.
- 27 Ward J. Continuing medical education, part 2: needs assessment in continuing medical education. *Med J Aust* 1988;148:77-80.
- 28 Norman GR. Defining competence: a methodological review. In: Neufeld VR, Norman GR, eds. Assessing clinical competence. New York (NY): Springer Publishing; 1985:15-35.
- 29 Rethans JJ, Strumans F, Drop R, et al. Does competence of general practitioners predict their performance? Comparison between examination setting and actual practice. BMJ 1991;303:1377-1380.
- 30 Pieters HM, Touw-Otten FWWM, De Melker RA. Simulated patients in assessing consultation skills of trainees in general practice vocational training: a validity study. *Med Educ* 1994;28:226-233.
- 31 Colliver JA, Swartz MH. Assessing clinical performance with standardized patients. JAMA 1997;278:790-791.
- 32 Colliver JA. Validation of standardized-patient assessment: a meaning for clinical competence. Acad Med 1995;70:1062-1064.

COMMENTARY

Educational interventions can change clinical behavior

During the past decade, medical education at the undergraduate level and, to a lesser extent, the postgraduate level has seen major reform. A key change has been the incorporation of problem- and case-based learning, both of which revolve around basic tenets of theory about how adults learn. Unfortunately for society, continuing medical education has not progressed much past the traditional lecture format that, on occasion, is followed by examinations. Often, even when given, these examinations may or may not be corrected. In this manner, continuing medical education is a one-size-fits-all exercise that is geared to a lecturer's assessment of learners' needs. Rarely are learners asked to assess their own knowledge, skills, or attitudes to help direct their learning. Similarly, the context of continuing medical education is rarely geared toward helping busy clinicians develop new ways to deal with real-life practice dilemmas or to assess their practice behaviors.

The article by Sanci and associates addressed two areas of great importance to primary care physicians. First, the authors designed a clear, interactive, and innovative program of continuing medical education based on the assessed needs of primary care physicians. The program was broken into bite-sized morsels, each of which focused on a different objective. Second, the authors took a content area, adolescent medicine, and attempted to provide pri-

mary care physicians with the skills, knowledge, and attitudes to better address this population that is underrepresented in the health care arena. Rather than assess short-term knowledge acquisition (multiple choice or true-false questions given at the end of the program), the authors relied on a systematic, nonbiased review of videotapes of clinicians (controls and intervention group) interacting with simulated adolescent patients (standardized patients).

Although the design was a rigorous randomized control trial, given the logistics of education research, the study design had some weaknesses—small sample size, variability in standardized patients, a potentially nonrepresentative group of clinicians, and lack of a pretest that would have allowed an initial comparison between the control and intervention groups. Despite these problems, the report is a welcome addition to the areas of both continuing medical education and adolescent medicine. Educators and medical leaders should take notice, for the approach used in this study is easily extrapolated to other content areas and groups of physicians.

The critical objective is to assess whether an educational intervention can be acceptable to physicians and result in long-term change in clinical behavior. In this study, both were possible.

Michael S Wilkes Editor, *WJM*

West J Med 2000;172:163