

Translating Research into Practice: The Role of Web-Based Education

Kenneth R. Weingardt
Steven W. Villafranca

SUMMARY. Clinical Practice Guidelines (CPGs) constitute a major focus of recent efforts to narrow the gap between research and practice. However, CBGs cannot effectively change clinical practice unless they are effectively disseminated. The present article describes a web-based course designed to teach nurses about a CPG for the management of alcohol withdrawal. In it, we outline the details of our web-based course, including its technical characteristics, organization, structure, and clinical content. Next, we outline several adjunctive strategies that may improve the effectiveness of such web-based educational interventions. Finally,

Kenneth R. Weingardt, PhD, and Steven W. Villafranca, MA, are affiliated with the Center for Health Care Evaluation, VA Palo Alto Health Care System, Stanford University School of Medicine.

Address correspondence to: Kenneth R. Weingardt, PhD, VAPAHCS, 795 Willow Road (152), Menlo Park, CA 94025 (E-mail: ken.weingardt@med.va.gov).

Support for this project was provided by the Department of Veterans Affairs (VA) Health Services Research and Development Service, and the VA Program Evaluation and Resource Center.

[Haworth co-indexing entry note]: "Translating Research into Practice: The Role of Web-Based Education." Weingardt, Kenneth R., and Steven W. Villafranca. Co-published simultaneously in *Journal of Technology in Human Services* (The Haworth Press, Inc.) Vol. 23, No. 3/4, 2005, pp. 259-273; and *Web-Based Education in the Human Services: Models, Methods, and Best Practices* (eds: MacFadden et al.) The Haworth Press, Inc., 2005, pp. 259-273. Single or multiple copies of this article are available for a fee from The Haworth Document Delivery Service [1-800-HAWORTH, 9:00 a.m. - 5:00 p.m. (EST). E-mail address: docdelivery@haworthpress.com].

Available online at <http://www.haworthpress.com/web/JTHS>

© 2005 by The Haworth Press, Inc. All rights reserved.

Digital Object Identifier: 10.1300/J017v023n03_07

259

we discuss other ways that web-based education may prove useful in disseminating evidence-based practices in human service delivery settings. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2005 by The Haworth Press, Inc. All rights reserved.]

KEYWORDS. Clinical practice guideline, web-based intervention, e-learning

NARROWING THE RESEARCH-PRACTICE GAP

Like most scientists, researchers working in human services presumably want their findings to influence practitioner behavior. However, successful researchers must focus their resources on getting grants, conducting studies and publishing articles in peer reviewed journals. Conversely, line staff responsible for the day-to-day provision of human services often want to be kept informed of the latest research, but rarely have the time or the training necessary to search, review, evaluate, and synthesize the scientific literature within the context of their daily work. The result of this disjunction has come to be known as the “research-practice gap” (Lamb & Greenlick, 1998).

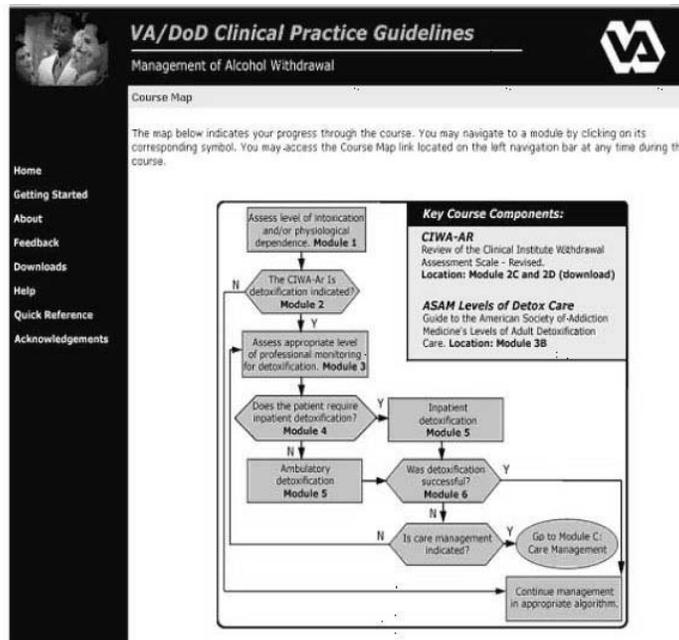
Despite the availability of empirically-supported treatments for patients with psychiatric and substance use disorders, established research-based interventions have generally not been widely adopted in clinical practice (Lamb et al., 1998). Federal agencies including the Substance Abuse and Mental Health Services Administration, the National Institute on Drug Abuse, the National Institute on Alcohol Abuse and Alcoholism, and the National Institute on Mental Health are all well aware of this gap and have been actively soliciting grant applications to address this problem for the past several years (Minkoff & Cline, 2003) (NIDA, 2003) (NIAAA, 2001) (NIMH, 2003).

Clinical Practice Guidelines (CPGs) constitute a major focus of recent initiatives to bridge the gap between research and practice. CPGs attempt to translate research into practice by systematically reviewing the literature and then deriving evidence-based recommendations, tools and/or strategies for the treatment of a particular disease or disorder in the form of an algorithm that guides the practicing clinician through a series of decisions and actions (Institute of Medicine, 1990; 1992). Ex-

amples of CPGs include the American Psychiatric Association’s Clinical Practice Guideline for the treatment of psychiatric disorders (APA, 2002), the New York State Department of Education Social Work Practice Guideline (NYS Education Department, 2002), and the Department of Veterans Affairs/Department of Defense Clinical Practice Guideline for the treatment of patients with substance use disorders (VHA/DoD, 2001) (see Figure 1).

CPGs bring the research literature one step closer to the practitioner by synthesizing the evidence and providing recommendations for changing clinical practice. However, a CPG can only influence clinical practice if it is actually *implemented*, meaning that the guideline is successfully moved out of the abstract phase of development and into the actual world of health care decision making and action (Institute of Medicine, 1992). And for a guideline to be implemented, it must first be *effectively disseminated* (Van Arminge & Shannon, 1992)– meaning that a practitioner must first become aware of a guideline and be-

FIGURE 1. Course Map



come familiar with its content before he or she can decide whether or not to follow its recommendations.

Web-based educational interventions are particularly well suited for this dissemination role. A well designed web-based training application can be quite effective at delivering what Rogers (1995) refers to as “how-to knowledge,” which consists of information that is necessary to use an innovation (such as a CPG) properly. According to researchers who study the diffusion of innovations (Rogers, 1995), this knowledge stage is particularly crucial, for when an adequate level of knowledge is not obtained prior to the trial and adoption of an innovation, rejection and discontinuance are likely to result.

In the present article, we describe a web-based course (www.detoxguideline.org) that we have developed to disseminate a set of recommendations from the “VHA/DoD Clinical Practice Guideline for the Assessment and Management of Substance Use Disorders in Primary and Specialty Care” (VHA/DoD, 2001). The purpose of this project is to facilitate implementation of evidence-based practices to objectively screen medical and surgical patients for risk of Alcohol Withdrawal Syndrome (AWS).

We chose this recommendation as the initial focus of our dissemination efforts because AWS represents a serious threat to the well-being of a substantial portion of surgical, trauma, and acutely ill patients, and results in unnecessary, costly medical care expenditures. Severe AWS has been associated with mortality rates ranging up to 40% (Wartenberg et al., 1990). Even in less severe cases, failure to provide prophylactic treatment for alcohol withdrawal can change a normal postoperative course into a life-threatening situation in which the alcohol dependent patient requires intensive care (Spies & Rommelspacher, 1999). Training medical and nursing staff to objectively monitor the severity of AWS risk has been found to significantly improve patient outcomes (Sullivan, Sykora, Schneiderman, Naranjo, & Sellers, 1989).

In the sections that follow, we outline the details of our web-based course, including its technical characteristics, organization, structure, clinical content, and the various measures and methods that we are using to evaluate its efficacy. Next, we outline several adjunctive strategies that can accompany the web-based educational intervention and may be necessary to address the intrapersonal, interpersonal, organizational and systematic barriers that can prevent changes in actual clinical practice. Finally, we discuss future directions and other ways that web-based education may prove useful in disseminating evidence-based practices in human service delivery settings.

COURSE DESCRIPTION

Overview

The authors have developed a self-paced, interactive course which closely follows the step-by-step decision tree outlined by the authors of the Department of Veterans Affairs/Department of Defense Clinical Practice Guideline for the Management of Substance Use Disorders (VHA/DoD, 2001). Although the entire CPG is quite voluminous, our course focuses exclusively on several key recommendations made in the guideline regarding the detection, assessment and prevention of Alcohol Withdrawal in medical and surgical patients. Learners follow a case study depicting a nurse and patient going through the series of decisions and actions that are recommended in the guideline. The course begins with the patient's initial admission to the hospital, through an assessment of intoxication using a breathalyzer, and includes step-by-step instruction in the administration and coding of the Clinical Institute for Withdrawal Assessment–Alcohol, Revised [CIWA-Ar, c.f. (Sullivan et al., 1989)], which is a 10-item objective measure of patient's risk of developing Alcohol Withdrawal Syndrome. The interface was designed around a "course map" that closely resembles the CPG algorithm. Clicking on any of the symbols in this map takes the user to the corresponding module. See Figure 1 to view the course map or access it online at www.detoxguideline.org.

Design and Development

This course was built in collaboration with graduate students from the San Jose State University Department of Instructional Technology. Four masters-level practicum students worked with the CourseBuilder extension to Macromedia's Dreamweaver 4.0 development platform to generate basic HTML pages for the course. The photographic case study sequences were produced with the help of a professional producer, a photographer and actors at a location provided with the assistance of the Greater Los Angeles VA Health Care System. Photographic sequences with subtitles, as well as several other animated sequences, were optimized in Adobe Photoshop 6.0 and Macromedia Fireworks 4.0, with the final version presented using Macromedia Flash 5.0.

Design and development of the web-based course began in January, 2002, and was completed in August, 2002. The course has been subjected to periodic technical testing and content review throughout its develop-

ment. Informal beta testing was conducted internally, with approximately 15 individuals providing detailed feedback. Beta testing and feedback was also provided by the practicum students and their classmates, who reviewed the course as part of their internship requirement. Content level review was provided by subject matter experts to ensure that the course adhered to both the word and spirit of the original guideline document. Finally, and perhaps most importantly, the course was reviewed by a group of 16 medical and surgical nurses at the VA Puget Sound Health Care System who provided initial, formative feedback on the content design, usability and practical relevance of the course.

An innovative aspect of our web-based course is that it incorporates a “Quick Reference” feature that was always available to the learner through a link on the left bar. Our Quick Reference feature was designed to serve as an Electronic Performance Support System [(c.f. (Gery, 1991)]. Whereas traditional web-based courses are designed to teach the learner a particular set of facts or skills that must be memorized and later recalled, an Electronic Performance Support System is designed to provide just enough information to get the job done. The Electronic Performance Support System was geared towards health care providers who are naïve about the guidelines for the management of AWS. This support system was designed to exist independent of the web-based course. Consequently, the learner can quickly find answers to frequently asked questions about AWS without having to find the content in the course itself. As a result of its relative ease of use, the course has been approved to provide Continuing Medical Education credit within the VA system.

Pedagogical Approach

While an asynchronous Web-Based Training course is largely considered to be an instructivist strategy, the present course also contains several constructivist elements. For instance, the integration of a realistic case study throughout the course is consistent with many constructivist design principles. Jonassen (1994), a well known proponent of constructivist theory, highlights many of the advantages that may accrue from this approach. For example, the case study presentation provides learners with authentic tasks embedded within a real-world case-based learning environment. Honebein (1996) also highlights the importance of embedding learning in a realistic and relevant context. In our course, features such as the Electronic Performance Support System and the course map serve to maximize learner control, a concept that is central to the constructivist approach (Wilson & Cole, 1991).

We believe that the use of both instructivist and constructivist elements has advantages over the use of a single model. An instructivist approach allows for individuals with small amounts of time (such as busy medical staff) to identify and access relevant material in a relatively short time, while simultaneously addressing the needs of individuals who have time to engage with the material in more detail. A constructivist approach contributes to the transfer of training through the use of realistic and job relevant tasks. The instructivist approach stresses the problem solving aspects of instructional design and allows for an accurate assessment of learning objectives (knowledge transfer), while the constructivist approach is learner centered and emphasizes the process, rather than the product of learning. We contend that a blending of these models will result in maximum learner benefit.

Student Learning Objectives

Each step on the decision tree represents a module of the course, and each module is designed around a single student performance objective. Participants proceed step-by-step to determine a patient's level of intoxication and/or physiological dependence at the time of admission, assessment of the signs and symptoms of AWS, categorization of patient into inpatient or outpatient detoxification, and, finally, assessment of the success of detoxification.

Target Audience

Our target audience are members of hospital nursing staff who work on inpatient general medicine and surgery units. Staff members who work in settings that provide specialized treatment services for detoxification or substance use disorders will not be included in the sample. The rationale for focusing on general practitioners is that they typically have less training in the detection and management of AWS than staff of acute psychiatry and detoxification units, hence deriving more benefit than participants recruited from practice settings where staff are more likely to have received such training.

OUTCOME MEASURES

Our measures fall into four general categories (1) Measures of exposure to the intervention, (2) Measures of learning, (3) Measures of

knowledge and skill transfer, and (4) Measures of patient-level and systems-level outcomes (see Figure 2). These categories roughly correspond to the four-level model of training evaluation developed by Donald Kirkpatrick during the late 1950s (Kirkpatrick, 1959a; 1959b; 1960a; 1960b).

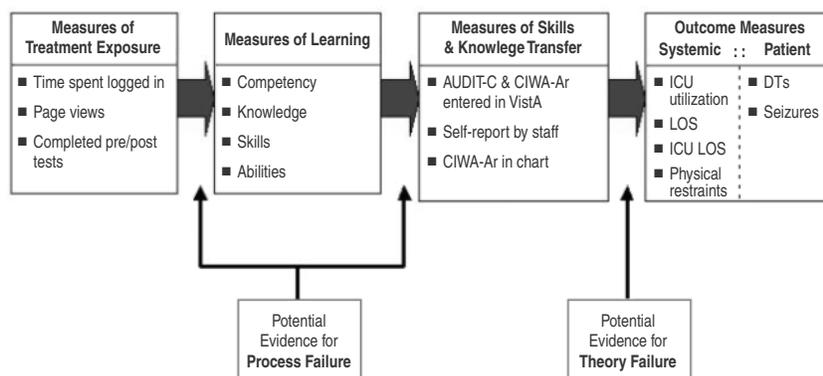
1. Measures of Exposure to the Intervention

Measures in this category indicate whether participants actually received the intervention as intended. Because participants are assigned a unique password and subject identifier, we can track how much time they spend viewing the course material overall, as well as how much time they spend on specific presentations and interactive activities within the course. Using web tracking software, we will also track which part of the Electronic Performance Support System features they access, and for how long. Participants will also be required to take a pre-test when they first access the online materials, and a post-test once they complete the course.

2. Measures of Learning

A Level II evaluation assesses the extent to which students have learned new skills, knowledge, or abilities as the result of an intervention. The difference between scores on a test administered before and after the online intervention (pre- and post-test) serves as our measure of learning. Ten multiple choice items on this pre- and post-test will as-

FIGURE 2



sess participants. Assessment questions cover such topics as knowledge of the signs and symptoms of alcohol withdrawal, the CIWA-Ar scales and scoring conventions, and the American Society for Addiction Medicine patient placement criteria for detoxification.

3. Measures of Knowledge and Skill Transfer

Measures in this category indicate the degree to which participants who were exposed to the intervention actually change their clinical practice behavior in accordance with the recommendations of the CPG. On the Kirkpatrick scale, this would constitute a Level III Evaluation, which measures the knowledge and skills transfers into changes in behavior (i.e., the extent to which the learner's behaviors changed due to the training program). It attempts to answer the question—Are the newly acquired skills, knowledge, or aptitudes being used in the everyday environment of the learner?

The primary measure of knowledge or skills transfer is the incidence of screening for AWS risk using the CIWA-Ar. The CIWA-Ar is a valid and reliable 10 item scale for clinical quantification of the severity of AWS which has successfully been incorporated into the usual clinical care of patients undergoing alcohol withdrawal (Schumacher, Pruitt, & Phillips, 2000). An increase in the rate of CIWA-Ar administration following training would indicate that practitioners are changing their behavior in response to our web-based educational intervention. We are currently collaborating closely with our Information Technology staff to implement a template for the CIWA-Ar in the VA's Computerized Patient Record System. By so doing, we hope to facilitate both the collection of this data by nursing staff, and the periodic reporting of this data as a measure of guideline concordance.

4. Measures of Patient-Level and Systems-Level Outcomes

Because our course is being evaluated in the context of a health services research project within the Department of Veterans Affairs, we have the good fortune of having access to administrative databases that automatically track a wide variety of patient-level variables. These are patient outcomes that we expect to be affected by our intervention, and include (1) Intensive Care Unit admission and readmission, (2) Intensive Care Unit Length of Stay, and (3) Overall in-hospital length of stay. Measures 1-3 will be obtained from national VA administrative databases, and will be compared for patients treated by nurses who received

the intervention versus those who did not. We expect patients who are treated by nurses who receive the intervention will experience Alcohol Withdrawal Syndrome less frequently, and consequently will require fewer trips to the Intensive Care Unit, and shorter time spent in the hospital.

PILOT STUDY RESULTS

Our web-based course was recently used as an integral part of training nursing staff to administer the CIWA-Ar at the VA Puget Sound Health Care System. Participants met together in a conference room and KRW spent approximately one hour showing nurses the online course, which focused predominately on use of the CIWA-Ar to assess the signs and symptoms of withdrawal. Sixteen attended the training and evaluation session over the course of two days.

All participants filled out a pre- and post-test, and a course evaluation form. Initial reactions to the online intervention were overwhelmingly positive. Using a 5 point rating scale (where 1 is "poor" and 5 is "excellent"), respondents were asked to rate the usefulness and appropriateness of course content, the reality and presentation of the case study information, and design features such as, logical presentation of content and use of graphics and color. Mean ratings for all ten evaluation items ranged from 4.25 to 4.63, with no items rated below a 4. The 100% of pilot study participants agreed strongly with the statement, "I like that I can review the material contained in this online program at my own pace at any time," and 100% of participants expressed a strong interest in taking such an online course for Continuing Medical Education credit. In fact, the course is now offered for Continuing Medical Education credit within the VA system. When given the opportunity to provide open-ended feedback, one nurse indicated that she thought the course was "very comprehensive," and another wrote "Realistic case study, easy to navigate, I love the online ease and availability." Finally, a comparison of pre- and post-test scores indicated that exposure to the course may result in significant improvements in knowledge about the standardized assessment of the signs and symptoms of AWS. Among those who have already completed the course, post-test scores tend to be higher than pre-test scores. Although this trend is not yet statistically significant, it may well reach that level once more learners have completed the course and more data is available for analysis.

DISCUSSION

Web-Based Education Alone Is not Enough to Narrow the Research Practice Gap

While successful knowledge transfer such as that achieved with our Web-Based course is a necessary precondition for translating research into practice, such a narrow educational approach when used alone is unlikely to effect enduring changes in clinical practice. In fact, the empirical literature on guideline implementation in medicine has clearly demonstrated that interventions designed to change clinical practice are much more likely to be successful when they combine multiple approaches (Grol, 2001; Shaneyfelt, 2001).

Approaches to changing clinical practice can be classified within one of two general categories: approaches that focus on factors *internal* to the clinician, and those that focus on factors *external* to the clinician (c.f. (Weingardt, in press), (Grol, 1997, 2001; Grol & Grimshaw, 1999). Strategies belonging to the first category attempt to change clinical practice by influencing the *internal* cognitive and affective processes of the individual practitioner. This would include marketing strategies that focus on developing an attractive product adapted to the needs of the target audience, for example disseminating brochures or other promotional materials designed to raise practitioners' awareness of a change initiative. Educational approaches themselves fall into this category as well, as they focus on changing the internal cognitive processes of the learner by providing instruction regarding new knowledge and skills.

The second category of strategies that focuses on factors *external* to the clinician can serve as powerful complements to internally-focused approaches such as web-based education. To be maximally effective, a web-based educational intervention could be embedded in a larger intervention focused on external, systemic influences. For example, we plan to embed our Preventing Alcohol Withdrawal web-based course within a larger organizational intervention that we refer to as a Guideline Implementation Group. The structure and process of this group is roughly analogous to what the Organizational Development literature refers to as a Process Action Team (French & Bell, 1999; Kinlaw, 1992). These groups will consist of key facility stakeholders, including representatives of the Chief of Staff's office, medical and surgical nurses and nurse managers, and Information Technology staff. This group will meet regularly in order to (a) document existing processes of care with regard to the prevention and management of AWS, (b) identify the barriers (interpersonal, social, and organizational) that might

prevent nurses from routinely screening patients for risk of withdrawal, and (c) developing a concrete plan to overcome these barriers and to ensure that the web-based educational intervention is successfully completed by all nursing staff.

Another externally-oriented approach in our effort to increase rates of screening for AWS, is to work closely with Information Technology staff to complete the development of an electronic clinical reminder for the CIWA-Ar screening measure using the VA's Computerized Patient Record System. If a patient screens positive for recent and/or excessive alcohol consumption, a template will automatically pop up on the nurse's desktop reminding him or her to conduct the screening, and providing a convenient way to easily enter the resulting data. This type of approach to practice change could be considered *organizational*, in that the focus is on creating structural and organizational conditions to improve care, as well as *behavioral* in that it focuses on reinforcing the desired performance.

FUTURE DIRECTIONS

Although this article focuses predominately on the role of asynchronous web-based training in the dissemination and implementation of clinical practice guidelines, there are many other innovative, and as yet unexplored, roles that web-based education might play in the process of translating human services research into practice. Such potential roles may include the use of asynchronous web-based training in the dissemination of empirically-supported, manual-based therapies and the use of synchronous e-Learning platforms for a variety of clinical training applications.

Synchronous Web-Based Education for Clinical Training

“Synchronous e-Learning” is a term describing a real-time, instructor-led learning event in which the instructor and all learners are logged on at the same time and communicate directly with each other, but are not physically present at the same location (Weingardt, in press). Synchronous e-Learning platforms are often referred to as virtual classrooms or web-conferences, and commercial versions are currently being offered by companies such as Placeware, WebEx, Interwise and Hewlett Packard.

One way in which these synchronous platforms could be leveraged for clinical training is to use them to facilitate case observation and real-time clinical supervision. For example, a web-cam in the therapy

room could be used to transmit a live audio and video stream of the interaction between a trainee who is learning an empirically-supported treatment and his or her client, to a clinical supervisor down the hall or anywhere else she or he has broadband internet access. Another potential application is for group supervision or training workshops. In this scenario, a clinical expert would be able to meet virtually with a group of geographically dispersed trainees to provide supervision and feedback regarding the implementation of an empirically supported treatment in their practice setting. Immediately following the implementation of the WBT, participants will be invited to attend a follow-up Virtual Classroom presentation where they can ask questions of clinical experts and the guidelines working group, interact in real time with their fellow physician-participants, and discuss the challenges of implementing the guidelines in their own practice settings.

CONCLUSION

The potential role of web-based education in narrowing the gap between research and clinical practice may be quite substantial (Weingardt, in press). Powerful authoring tools make it increasingly feasible and cost-effective to transform the content of Clinical Practice Guidelines and Manual Based Therapies into interactive and engaging web-based training applications. Such applications may increase the accessibility of empirically-supported treatments to clinicians, which may in turn increase the rate at which clinicians choose to adopt research-based recommendations into their daily practice. Although it is important to acknowledge the interpersonal, intrapersonal and organizational barriers that may prevent rapid changes in clinical practice, it seems likely that web-education, both asynchronous and synchronous, will play an increasingly important role in the future.

REFERENCES

- APA. (2002). American Psychiatric Association Practice guideline for the treatment of patients with substance use disorders: Alcohol, cocaine, opioids. In J. S. C. McIntyre (Ed.), *American Psychiatric Association Practice Guidelines for the Treatment of Psychiatric Disorders, Compendium 2002*. Washington, DC: American Psychiatric Association.
- French, W. L., & Bell, C. H. (1999). *Organizational Development: Behavioral Science Interventions for Organization Improvement, Sixth Edition*. Upper Saddle River, NJ: Prentice Hall.

- Gery, G. (1991). *Electronic Performance Support Systems*. Tolland, MA: Gery Associates.
- Grol, R. (1997). Beliefs and evidence in changing clinical practice. *British Medical Journal*, 315, 418-421.
- Grol, R. (2001). Improving the quality of medical care: Building bridges among professional pride, payer profit and patient satisfaction. *Journal of the American Medical Association*, 286(2), 2578-2601.
- Grol, R., & Grimshaw, J. (1999). Evidence-based implementation of evidence-based medicine. *The Joint Commission Journal on Quality Improvement*, 25(10), 503-513.
- Honebein, P. (1996). Seven goals of the design of Constructivist learning environments. In Wilson, B. (Ed.), *Constructivist Learning Environments*, 17-24, New Jersey: Educational Technology Publications.
- Institute of Medicine (1990). *Clinical Practice Guidelines: Directions for a New Program*. Washington, DC: National Academy Press.
- Institute of Medicine (1992). *Guidelines for Clinical Practice: From Development to Use*. Washington, DC: National Academy Press.
- Jonassen, D. H. (1994). Thinking technology: Towards a constructivist design model. *Educational Technology*, 34(4), 34-37.
- Kinlaw, D. C. (1992). *Continuous improvement and measurement for total quality: A team-based approach*. San Diego: Pfeiffer & Co.
- Lamb, S., & Greenlick, M. R. (Eds.). (1998). *Bridging the gap between practice and research: Forging partnerships with community-based drug and alcohol treatment*. Washington, DC: National Academy Press.
- Minkoff, K., & Cline, C. A. (2003). The missing link between science and service. *Psychiatric Services*, 54(3), 275.
- NIAAA. (2001). *Adoption of Alcohol Research Findings in Clinical Practice* (Program Announcement PA-01-058). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.
- NIDA. (2003). *Behavioral Therapies Development Program* (Program Announcement PA-03-066). Bethesda, MD: National Institute of Drug Abuse.
- NIMH. (2003). *Dissemination and Implementation Research in Mental Health*. PA-02-131.
- NYS Education Department (2002, 10/29/03). *Social Work Practice Guideline* [Web Site]. Office of Professions. Retrieved 01-21-04, 2004, from the World Wide Web: <http://www.op.nysed.gov/cswguides.htm>.
- Rogers, E. M. (1995). *Diffusion of Innovations* (4th ed.). New York: Free Press.
- Shaneyfelt, T. M. (2001). Building bridges to quality, Editorial. *Journal of the American Medical Association*, 286(20), 2600-2601.
- Spies, C. D., & Rommelspacher, H. (1999). Alcohol withdrawal in the surgical patient: Prevention and treatment. *Anesthesia and Analgesia*, 88, 946-954.
- Sullivan, J. T., Sykora, K., Schneiderman, J., Naranjo, C. A., & Sellers, E. M. (1989). Assessment of Alcohol Withdrawal: The revised clinical institute withdrawal assessment for alcohol scale (CIWA-Ar). *British Journal of Addiction*, 84, 1353-1357.
- Van Arminge, M., & Shannon, T. E. (1992). Awareness, assimilation and adoption: The challenge of effective dissemination and the first AHCPR-Sponsored Guidelines. *Quality Review Bulletin*, Dec. 1992, 397-404.

- VHA/DoD. (2001, April 2001). *VHA/DoD Clinical Practice Guideline for the Assessment and Management of Substance Use Disorders in Primary and Specialty Care* [Download from website]. The Management of Substance Use Disorders Working Group. Retrieved September 12, 2002, 2002, from the World Wide Web: http://www.oqp.med.va.gov/cpg/SUD/SUD_CPG/frameset.htm.
- Wartenberg, A. A., Nirenberg, T. D., Liepman, M. R., Silvia, L. Y., Begin, A. M., & Monti, P. M. (1990). Detoxification of alcoholics: Improving care by symptom-triggered sedation. *Alcoholism: Clinical and Experimental Research*.
- Weingardt, K. R. (in press). The role of instructional design and technology in the dissemination of empirically-supported, manual-based therapies. *Clinical Psychology: Science and Practice*.
- Wilson, B., & Cole, P. (1991). A review of cognitive teaching models. *Educational Technology Research and Development*, 39(4), 47-64.