

# The JOURNAL

of the New York State Nurses Association

## Spring/Summer 2001, Volume 32, Number 1

Editorial .....	3
<i>by Suzanne S. Dickerson, DNS, RN and Sharon Bidwell-Cerone, PhD, RN, CS-PNP</i>	
Adopting Handheld Computers for Community Based Curriculum: Case Study .....	4
<i>by Barbara A. Thomas, MA, MS, RN, FNP, Jean F. Coppola, PhD(c), MS, MS, BS and Harriet Feldman, PhD, RN, FAAN</i>	
Interactive Connections: Technologies Used in Nursing Education .....	7
<i>by Kay Sackett, EdD, RN, Suzanne S. Dickerson, DNS, RN, Patricia McCartney, PhD, RN, and Scott Erdley, DNS, RN</i>	
Nursing Informatics: The Future is Now .....	11
<i>by Barbara Carty, EdD, RN</i>	
Evaluating Health Information on the Internet: Empowering Consumers .....	15
<i>by Eileen H. Lantier, PhD, RNC</i>	
What's New in the Nursing Literature .....	20
A Nurse Pioneer in the Use of the Internet: Interview with Dr. Virginia Duffy .....	22
<i>by Sharon Bidwell-Cerone, PhD, RN, CS-PNP</i>	
Book Review .....	24
<i>by Warren Hawkes, MLS</i>	

*President:* Phyllis B. Collins, EdD, RN, CS-FNP, Staten Island  
*President-Elect:* Robert V. Piemonte, EdD, RN, CAE, FAAN, New York  
*Vice President:* Sister Theresa Graf, EdD, FNP, RN, South Hempstead  
*Secretary:* Lorna Stewart, MS, RNC, Brooklyn  
*Treasurer:* Elizabeth A. Mahoney, EdD, RN, Latham

#### **Directors at Large**

Joanne Billott, MS, RNC, Breezy Point  
Josephine Bolus, MS, RN, CNP, Brooklyn  
Lolita Compas, MA, RN, CEN, New York  
Joan Cumberbatch, MS, BSN, RN, Brooklyn  
Janice Howard, MS, RN, LeRoy  
Ellen Mitchell, MA, BSN, RNC, Staten Island  
Edmund J. Y. Pajarillo, MPA, RNC, CPHQ, CNAA, Kew Garden Hills  
Lorna Samuels, BSN, RNC, Brooklyn

#### **The Journal of the New York State Nurses Association Editorial Board**

Sonia Baker, PhD, RN Assistant Professor New York University New York, NY	Phyllis Lisanti, PhD, RN Clinical Associate Professor New York University New York, NY
Sharon Bidwell-Cerone, PhD, RN, CS-PNP Pediatric Nurse Practitioner Rochester, NY	Gail Malloy, PhD, RN Psychotherapist Floral Park, NY
Barbara Jaffin Cohen, EdD, RN Professor & Director Division of Nursing College of Mount Saint Vincent Riverdale, NY	Naomi E. Penney, PhD, MPH, RN Research Scientist Bassett Healthcare Research Institute Cooperstown, NY
Suzanne S. Dickerson, DNS, RN Clinical Associate Professor The University at Buffalo-SUNY Buffalo, NY	Jane Tuttle, PhD, RN Assistant Professor University of Rochester School of Nursing Rochester, NY
Naomi Ervin, PhD, APRN, BC, FAAN Associate Professor Binghamton University Binghamton, NY	Deborah Witt Sherman, PhD, RN, ANP, CS Assistant Professor New York University New York, NY
Rona Levin, PhD, RN Professor Emeritus Felician College Lodi, NJ	

---

Martha L. Orr, MN, RN, CAE, *Executive Director*  
Anne Schott, *Managing Editor*  
Genie Abrams, *Associate Editor*  
Kerri Posson, *Art & Production Coordinator*

*The Journal of the New York State Nurses Association* is peer reviewed and published biannually by the New York State Nurses Association. ISSN# 0028-7644. Editorial and general offices located at 11 Cornell Road, Latham, NY 12110. Telephone: 518-782-9400. Fax: 518-782-9533. E-mail: info@nysna.org. Annual subscription: no cost for NYSNA members; non-members: \$30.00.

*The Journal of the New York State Nurses Association* is indexed in the Cumulative Index to Nursing, Allied Health Literature, and the International Nursing Index. It is searchable in CD-ROM and online versions of these databases available from a variety of vendors including SilverPlatter, BRS Information Services, DIALOG Services, and The National Library of Medicine's MEDLINE system. It is available in microform from Bell & Howell Information and Learning, Ann Arbor, Michigan. Acceptance of advertising does not mean endorsement by The New York State Nurses Association of the product advertised, the advertisers, or the claims made. Similarly, rejection does not necessarily imply that a product offered for advertising is without merit, or that the manufacturer lacks integrity.

© 2001 The New York State Nurses Association

## Editorial

Today in the United States, technology supports our information economy, which changes the way work is conducted and how people interconnect and live their daily lives. For example, much of the growth of the Internet continues as a marketing tool with information, including healthcare information, as a commodity (Schement & Curtis, 1997).

About 17,000 biomedical Internet sites now exist, and computer-literate patients are seeking to take more control of their own health by using the Internet to self manage (Ehrenberger & Murray, 1998). However, access to the Internet is not universal. Groups of individuals do not have ready access to these resources because of lack of equipment, knowledge, or personal awareness. This is known as the digital divide, which affects predominantly minority, lower-income non-users (National Telecommunications and Information Administration, 1999).

Early uses of technology to support health care included hospital information systems and decision support systems. As managed care continues to influence health care, there is a need for patient-centered records that can be accessed across sites; legal, privacy, and security issues, however, need to be resolved (Staggers, Thompson, & Snyder-Halpern, 2000).

Recently at the Institute of Medicine (2001), a report from the Committee on Quality of Health Care in America, "Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century," recommends a redesign of care processes based on best practices. This initiative would be supported by information technologies customized to meet the patients' needs for safety, with the patient in control, facilitated by shared knowledge and a free flow of information. This report also recommends that the government authorize funding of a monitoring system to ensure quality. Technology forms a base for the majority of the reform efforts.

Technology initiatives are influencing the roles of nurses. The articles in this issue give examples of how nurses can use technology to enhance nursing education and ultimately practice, to begin an entrepreneurial business, and to consider career opportunities in nursing informatics. In addition, nurses must be aware of the influence of the Internet on patient information and power.

Thomas, Coppola, and Feldman report on a case study in which they adopted handheld computers for a community-based curriculum. They discuss project implementation, including faculty and student training. Useful functions of the systems were the ability to interact with faculty, enter data, and access Internet information while in the patients' homes.

Sackett, Dickerson, McCartney, and Erdley describe a variety of technology initiatives that support communication/information gathering and practice skills used in both an undergraduate and graduate nursing program. Examples included discussion lists, critiquing Web sites, patient simulation technology, and videoconferencing abilities.

Barbara Carty introduces nursing informatics as a career opportunity for nurses. She presents the current education and practice milieu of the specialty, which is an exciting new opportunity for nurses.

Eileen Lantier reports on how nurses can support consumer use of the Internet for accessing health information by guiding them to reliable resources and providing tools to evaluate the information.

The interview of nurse entrepreneur Virginia Duffy by Sharon Bidwell-Cerone introduces a pioneer who created a Web site to offer expert health information for consumers and professionals alike.

These articles show the growing influence of technology in health care, a trend which will affect nursing practice as well as patients' role in their own care. Given the growing impact of this new technology, it is important to recognize the digital divide and to advocate for universal access.

Suzanne S. Dickerson, DNS, RN  
Sharon Bidwell-Cerone, PhD, RN, CS-PNP

- Ehrenberger, H., & Murray, P.J. (1998). Issues in the use of communications technologies in nursing research. *Oncology Nursing Forum*, 25(10), 11-15.
- Institute of Medicine. Committee on Quality of Health Care (2001). *Crossing the quality chasm: A new health system for the 21<sup>st</sup> century*. Available on-line at <http://books.nap.edu/books/0309072808/html/221.html>
- National Telecommunications and Information Administration (NTIA), (1999). *Falling through the net: Defining the digital divide*. [On-line] <http://www.ntia.doc.gov/ntiahome/fitn99/contents.html>
- Schement, J. & Curtis, T. (1997). *Tendencies and tensions of the information age*. New Brunswick, NJ: Transaction Publications.
- Staggers, N. Thompson, C., & Snyder-Halpern, R. (2001). *History and trends in clinical information systems in the United States*. *Journal of Nursing Scholarship*, 33(1), 75-81.

# Adopting Handheld Computers for Community-Based Curriculum: Case Study

*Barbara A. Thomas, MA, MS, RN, FNP*

*Jean F. Coppola, PhD(c), MS, MS, BS*

*Harriet Feldman, PhD, RN, FAAN*

## ABSTRACT

A new technology, a handheld pen-based computer (the Nightingale Tracker), was introduced to complement a new community-based curriculum at the Lienhard School of Nursing, Pace University, New York. This article describes the initial concept, interdepartmental partnerships, faculty training, student training, participant selection, challenges, supplemental features, project evaluation, and future initiatives.

End-of-semester evaluations indicated high student satisfaction. As a result, strategies for future Tracker training and implementation have been established. Factors leading to student satisfaction were the ability to obtain frequent faculty feedback, email capability through the handheld computer, ease of data entry through checklist questions, and retrieval via a standardized nursing vocabulary.

The faculty of the Lienhard School of Nursing at Pace University began investigating community-based strategies and technology that might prove useful in preparing for emerging nursing education issues related to the future of health care. A significant issue was the shift of student clinical experiences from hospitals to community settings. Another issue was the increasing need to integrate technology into the curriculum. To address these issues, the school's Learning Resource Center sought technological solutions, which could enhance student learning and better prepare students for careers. The center chose a new technology — the handheld computer known as the Nightingale Tracker. The Nightingale Tracker has a keyboard on its screen, and information is entered by tapping on the screen with a special pen. This system requires telecommunications software with a standardized clinical language (Elfrink & Martin, 1996). The clinical language chosen was the Omaha System (<http://www.carefacts.com/art3.htm>), which uses a standardized nursing vocabulary and

has been accepted by the American Nurses Association. Enabling students to use this handheld computer would help them become more computer savvy and prepare them for the real world environment.

Technical expertise was needed to support the handheld computer, requiring a close partnership between the university's nursing school and its Division of Information Technology. Staff from the information technology area, mainly in desktop support, helped with set-up/installation, and continued to provide technical support throughout the project.

## Faculty Training

Although training is often overlooked because of monetary constraints, it is probably the single most important feature in the success of adopting these computers for the community-based curriculum. During an intensive three-day training period at the Fuld Institute for Technology in Nursing Education (FITNE) headquarters, faculty were introduced to the Omaha System. Simultaneously, the information technology staff learned the technical

details of server support. The participants' confidence increased as they practiced entering and retrieving data from the server. After this initial off-campus training, learning continued back at the campus.

Faculty needed time to practice before orienting the students to the devices. All those who participated in the training trip continued to work and email each other about discoveries they made as they navigated through patient data entry and hardware utilization. The University of Southern Florida, located in Gainesville, was designated by FITNE as a Center for Excellence for these computers and systems. Schools that adopted the computers were encouraged to communicate with the Center for assistance in the implementation process.

Several important pieces of information came from the Center in Gainesville. For example, they used brightly colored, insulated small bags with handles to transport the computers. Surprisingly, the bags selected were sold locally as lunch bags and were just the right size to hold a small Omaha language ref-

*Thomas is director of the Learning Resource Center and adjunct associate professor in the Lienhard School of Nursing. Coppola is in charge of Major Information Technology Initiatives and Grants and is adjunct assistant professor in the School of Computer Science and Information Systems. Feldman is the dean of the Lienhard School of Nursing. All work at Pace University, New York.*

erence book, necessary cables, and the computer. Students felt more comfortable transporting the expensive computer in a bag that did not identify it as a piece of computer equipment. The bag also provided protection if dropped.

A training schedule for faculty, staff, and students was set up to complement both the didactic and technology content. Several student assistants from the Information Technology Division were trained to support the project.

## Student Training

A two-day training session for students was developed. The first day introduced the Omaha System, both the electronic and paper system. After the first day, students were allowed to take the handheld computer home overnight to familiarize themselves with its operation and get a feel for the system. The second day was devoted to using the FITNE Web site and case studies to enter data in the handheld computers and transmit the information over a modem or network to the server. The students also learned how to backup their patient data to a removable internal memory card. This gave the students additional confidence in using the system, because this memory card could easily be placed in another computer.

## Selection of Students

The faculty involved in the training solicited students for the project who were enrolled in a five-year combined program leading to both a bachelor's and master's degree. Eight students volunteered; all were computer literate.

At the start of the first day of training, each student received a binder with all pertinent information. The binders contained instructions on how to operate the handheld computer, plus telephone numbers, codes, and ready references to help them from both the clinical setting and home. The students agreed that regular contact and quick replies from their instructor were extremely helpful during the first few weeks as they were becoming adjusted to the system and retrieving data from the server. The Learning Resource Center was also available to students if they needed further assistance. A dial-up telephone line to the server was installed so that faculty and students could email technicians for faster help, especially from the field. Students felt a high level of confidence that data entered would not be lost, because data could be backed up on a memory card. Doing a quick, easy backup each day ensured that valuable patient data would not be lost if their handheld computer had a failure or the server was down.

## Challenges

After a semester of use, the need for two additional features emerged. One was the ability to synchronize data from the handheld device into a desktop microcomputer. Another was the ability to write data in longhand directly on the handheld, computer screen. This is known as a stroke input and would enable those students who had difficulty with a keyboard to write using a stylus-type device. A stroke input option allows data to be more quickly and conveniently entered than a software keyboard option, especially when large amounts of data are involved.

## Supplemental Features

### *Data Recovery and Backup Capability*

The first concern from the technical support point-of-view was how to recover data if hardware broke. A backup plan was needed, and it had to be fast and effortless in order to entice students and faculty to back up regularly. Internal memory cards became the option

of choice. The memory cards were relatively inexpensive, easy to install, required no maintenance, and provided an easy, reliable method of back up. During the training sessions, students and faculty were given hands-on experiences for patient data backups, using the equipment while technical support staff were on-hand to answer questions.

### *Internet Access*

Early on, the students asked if the handheld computer could search the Web. Searching the Web could help the students obtain drug information, answer patient questions, and find Web sites related to their coursework in a timely fashion. After considerable perseverance, the handheld computers were configured to make access to the Web possible from anywhere there was an analog dial-up phone line, including their own home or a patient's residence. The students felt this was especially useful when they knew the exact address of the Web site they wanted to show the patient.

## Evaluation

At the end of the semester, faculty, students, the project director, the information technology staff, and management evaluated the project. Students usually drive the learning/teaching needs, pushing the faculty to go beyond the old ways. Soules & Adams (1998) noted that as students are engaged in learning, they develop self-efficacy, soon wanting more. As their comments revealed, the students in this project developed self-efficacy and soon wanted more.

### *Faculty/Student Comments*

- Students indicated that a second meeting, two weeks after the initial training, should be scheduled. This would allow them to demonstrate the problems they were experiencing while the technology staff watched. Server and dial-up problems could have been adjusted first hand. Making repeat good connections while someone was on hand to answer questions would have shown students that they were progressing in the right direction. Additional practice in transmitting data to the server and gaining a fuller understanding of the patient database structure were also suggested.
- Students liked carrying the computers in an insulated lunch bag, because they believed there was less chance of theft.
- Students said it would be helpful to keep the Omaha small reference sheets used in training in the computer bag since it was their first exposure to the Omaha system.
- Students thought it would also be beneficial to use the computers while they were attending adult nursing content courses on campus.
- Students would have preferred to use their real names as their login identifiers instead of a generic name and number.
- Students thought competence with the computer and system should be assigned a significant percentage of their grade.
- Faculty felt they could have used an additional training session with the in-house technology staff before the student training. This would have made them more confident, working with the initial group of students.
- Faculty and staff agreed that frequently accessed sites on the Internet should be identified and added as bookmarks on the Web interface. Those sites included ones dealing with diabetes, blood pressure, cancer, drug information, and community reference sites for patient education.

- Information technology staff noted that contact information given for technical support and notification of problems should be reinforced, because the general central support structure was not prepared to handle specific hardware/software related questions.

### Future Initiatives

An additional piece of software made available to Pace University after the first semester of using the system was a physical assessment component. Since all baccalaureate and graduate nursing students incorporate physical assessment into their daily clinical settings, this software represented a valuable addition to their data retrieval. The physical assessment software was well designed, intuitive to operate, and used a small amount of hardware resources.

Future plans are to train an additional faculty member, seek more funding, and secure more computers. This project has great po-

tential growth for student integration. Pace University will continue to share information with the Center for Excellence.

The next phase of the project will be to integrate the handheld computer into student hospital experiences, and then establish guidelines for their practice. Staff could be trained in the functionality of the computers and add to the research regarding effective patient outcomes.

### Final Discussion

All involved in this project were excited with its initial response and acceptance. The representatives from the agencies were enthusiastic about the Omaha System and its link to software mandated by the government.

This handheld computer shows great potential for use in community health care by students and nurses in the field. The computer's (Nightingale Tracker) size, connectivity features, and ability to retrieve and organize patient data with updates on a continuous basis are the keys to its usefulness.

Furthermore, each visit can be instantaneously recorded and once sent to the server, can be retrieved back at the office within minutes if necessary. The ability to navigate the Web, show Web sites to the patients, and access teaching plans allows for individualization of care instead of waiting a week or longer for the next visit. Electronically inputting the data immediately and efficiently will decrease longhand recording and free the community nurses to do what they do best — care for clients!

### Acknowledgements

We would like to acknowledge the support and help of the Lienhard School of Nursing, Information Technology Division including Telecommunications and Information Technology Integration, The Hugoton Foundation, FITNE, and General Magic Inc., and the faculty and students who worked with us through the initial development, design and implementation of the project.

Table 1 Guidelines for Tracker Training

Plan	Objective
Stage 1 <ul style="list-style-type: none"> <li>Begin training with other early adopter schools</li> <li>Present sessions over a 3-day period</li> </ul>	Stage 1 <ul style="list-style-type: none"> <li>Allow teachers and information technology representatives adequate time to acquire knowledge and skills necessary to begin initial start-up program</li> </ul>
Stage 2 <ul style="list-style-type: none"> <li>Perform teacher integration</li> <li>Conduct short practice sessions</li> <li>Develop partnership with information technology and nursing faculty</li> <li>Determine information technology support needed</li> <li>Set up outcome criteria</li> </ul>	Stage 2 <ul style="list-style-type: none"> <li>Schedule time to practice for faculty with technical support on hand</li> <li>Allow at least one hour for practice</li> <li>Gather feedback from faculty to tweak and work out bugs in the system before student involvement; email phone numbers for Q&amp;A</li> <li>Establish educational guidelines in integrating tracker in curriculum</li> </ul>
Stage 3 <ul style="list-style-type: none"> <li>Conduct student training</li> <li>Obtain feedback on student experiences</li> </ul>	Stage 3 <ul style="list-style-type: none"> <li>Reserve two days for student training</li> <li>Day One: Paper and pencil using Omaha system and data sets</li> <li>Day Two: Case studies and electronic implementation</li> </ul>
Stage 4 <ul style="list-style-type: none"> <li>Effect student adoption of the system, utilizing the handheld computer in clinical agencies</li> </ul>	Stage 4 <ul style="list-style-type: none"> <li>Provide quick turnaround technical support</li> <li>Initiate faculty mentoring</li> </ul>
Stage 5 <ul style="list-style-type: none"> <li>Set up criteria for hospital-based practice</li> </ul>	Stage 5 <ul style="list-style-type: none"> <li>Begin use of handheld computers within hospital setting</li> </ul>

## REFERENCES

Elfrink, V., & Martin, K. (1996, Summer). Educating for community nursing practice: Point of care technology. *HealthCare Information Management*, 10 (2), 81-89.

Katz, R. N., & Associates. (1999). *Dancing with the devil: Information technology and the new competition in higher education*. San Francisco: Jossey-Bass.

Soules, A., & Adams, E. (1998, May/June). Classroom technology: A view from the trenches. *Educom Review*, 33 (3), 50-53.

Thomas, B. A., & Coppola, J. F. (1999, Fall). Pace University goes back to the future: E-classrooms make technology work for learning. *HealthNet*, www.fitne.net/healthnet/archives/Fall99/Index.html.

Thomas, B. A., & Coppola, J. F. (2000, Winter). Teacher meets techie. *HealthNet*, www.fitne.net/healthnet/archives/Winter99/teacher.html.

# Interactive Connections: Technologies Used in Nursing Education

*Kay Sackett, EdD, RN*  
*Suzanne S. Dickerson, DNS, RN*  
*Patricia McCartney, PhD, RN*  
*Scott Erdley, DNS, RN*

## ABSTRACT

Nursing faculty use technology in active learning strategies in the undergraduate and graduate programs at the University at Buffalo, SUNY. This article describes a variety of technology initiatives organized around two themes: communication/information gathering and practice skills.

The goal of nursing education is to provide future practitioners with the knowledge and skills needed for an increasingly diverse population. It is essential for today's professionals to connect across cultural divides and to develop networking communities that empower nurses and their clients. This can be facilitated through applications of technology.

These initiatives for nursing education are present in the American Association of Colleges of Nursing (AACN) Essentials of Baccalaureate Education (1999), which include core knowledge and competencies that can be acquired through technology use and active learning strategies. Core knowledge includes information and healthcare technologies and global health care. Their core competencies include communication and critical thinking, which can be facilitated by using technology.

AACN also recognizes the importance of expanding access to nursing education beyond traditional boundaries as evidenced in

*White Paper: Distance Technology in Nursing Education* (AACN, 1999), which supports the use of technology to improve access to, and the quality of, nursing education. Distance education can provide access for nursing students in remote sites. In addition, technology can be used in the local classroom to facilitate active learning.

The inclusion of technology in the classroom is on the rise. Technology is defined as "the application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect" (Microsoft's *Computer Dictionary*, 1995, p. 384). To date the most common technologies used in nursing education are "computer-assisted instruction" (CAI), presentation media courseware, interactive television, audio and visual conferencing, electronic mail, World Wide Web-based coursework, and "virtual reality" (Mallow & Gilje, 1999 p.249). At the Univer-

sity at Buffalo (UB), students are admitted into the nursing program with basic skills in word processing, Internet searches, spreadsheets and data base management, creating PowerPoint presentations, and email communications. Students are expected to access information via the university Web site, register on-line, procure course grades on-line, monitor their personal progress from admission through graduation, participate in on-line courses and electronically reserve course materials. The State University of New York schools are ranked 7<sup>th</sup> among educational institutions in *PC Weekly's* listing of "Fast track technology innovators" in the United States. (SUNY Ranked Among Best in the Nation in Information Technology, 1999).

The UB School of Nursing further fosters the use of technology to facilitate learning by encouraging student involvement in analysis, synthesis, and evaluation. Active learning strategies emphasize developing skills and involve a higher order of thinking (Bonwell &

*Sackett is a clinical assistant professor; Dickerson an assistant professor; McCartney a clinical full professor; and Erdley a clinical assistant professor; all in the School of Nursing at the University at Buffalo/SUNY.*

Edison, 1991). Measures of information retention, problem solving, and motivation for further learning are higher for active learning methods than traditional passive lecture methods (McKeachie, Pintrich, Yin, & Smith, 1987). However, active learning methods require that students take a greater responsibility for their learning.

The UB School of Nursing faculty uses a variety of technologies to facilitate active learning in both the undergraduate and graduate programs. They are structured around two themes: communication/information gathering and practice skills.

### Communication/Information Gathering

Communication and data gathering skills are essential to practitioners in the nursing profession. These skills are developed in a variety of ways.

ample of socially situated learning in which students initiate their own self-regulated learning. Faculty provides guidance and feedback to encourage professional socialization. This includes reviewing the student's proposed post, the actual post, and on-line replies to the faculty member, which helps students identify emergent issues and relevant references. One student posted a question about research discussed in class and was thrilled to find the author of the study was a list member who replied to the student's post! Students eagerly shared the responses they received from nurses out in the field.

### Information portal/data base access

Databases are an aggregation of records or data archived to manage large amounts of information. Students are introduced to the library information Web site, an information portal (HUBNET) that provides access to library and informational resources including local, regional, national, and international data bases. The UB libraries provide a resource librarian who is also a registered nurse. This librarian helps faculty and students use many information resources and offers a class on locating evidence-based healthcare resources from electronic databases. Students participate in practice exercises to locate the best evidence for specific health problems. In addition, all levels of nursing courses require students to access current research and evidence-based guidelines for practice as well as current information on practice issues. Students are expected to provide evidence in the form of professional references in all presentations and clinical logs.

### Critiquing Web sites

The World Wide Web is an international group of databases within the Internet, which allows students to access a vast and rapidly expanding collection of information. In several courses at the undergraduate and graduate levels, students evaluate the information that is accessed on the Internet. Students in a healthcare delivery class access and evaluate telemedicine Web sites using the following criteria: authorship (credentials, sponsors, and links), content (purpose, audience, bias, citations, comprehensiveness), currency (site current, site creation, links) and style (grammar, organization, and ease of navigation). This assignment increases awareness of the need to critically evaluate Internet information.

### Web-based courses

A course management system was implemented at UB and adopted by the School of Nursing to add interactive, integrated learning experiences to the curriculum. A course management system is a Web-based learning environment designed to facilitate teaching a course entirely on the Web or to supplement an existing class with, for example, syllabi, learning materials, class discussions, and testing features. Students were exposed to the use of technology for knowledge acquisition, communication, and managing information. As the students followed independent learning activities, they read articles, accessed on-line resources, discussed results with classmates on-line and provided structured analyses of the information in summary postings. For example, to gain understanding of culture and image in nursing, students had to read several articles on each topic, search the Web for information, and provide the URL as a reference. They developed their personal philosophy of nursing, which emphasized the need for increased cultural sensitivity and an enhanced image of nursing. This philosophy of nursing was to be posted for discussion and reviewed by their peers and faculty member on the discussion board. The use of the discussion board facilitated communication among all

Table 1 Discussion List Assignment: selected lists and topics

Lists Used	Discussion Topics
•Student Nurse	therapeutic touch
•NurseNet	nursing diagnosis & nursing career plans
•Nursing Informatics	use of informatics
•NP Info	advanced practice legislation
•GlobalRN	DNR in the OR
•Perioperative	body mechanics with OR equipment
•School Nurse	bike safety
•Perinatal List	research on labor nursing
•Lactnet	cupfeeding newborns
•BirthEd	birth providers
•NeonatalTalk	neonatal ostomy care
•Midwife	breastfeeding

### Discussion Lists

Discussion lists are electronic mailing services on the Internet that automatically deliver topic-specific information to a subscriber's email address. Students learn to communicate on-line in a professional way and explore such issues as confidentiality and accountability (McCartney, 2000). In the first semester of nursing courses, all students receive written instructions and a class demonstration on how to subscribe to a class discussion list. The students remain on the list through all subsequent nursing courses. Faculty members facilitate communication and coursework throughout the program and moderate the class list. Students use the course list to ask questions about assignments and schedules, to share references, to plan work group meetings, and to encourage each other. Students also participate on a nursing student organization discussion list.

One undergraduate assignment in a clinical course is to subscribe, post, and then unsubscribe to an Internet nursing discussion list (Table 1). Students are expected to contribute to a discussion thread with a reference-supported question or reply. For instance, students interested in women's health joined a prenatal discussion list. This activity promotes participation in global professional networking, stimulates investigation and reflective response to a contemporary nursing issue, and develops informatics knowledge and skills. This is an ex-

## *“The excitement of the mock trial format sparked student creativity.”*

members of the class. These active learning strategies enhanced the students' management of information and helped them develop a concise description of their personal philosophy of nursing. Portions of selected courses are provided on-line and are currently being evaluated for teaching/learning efficacy. Faculty believes that it is necessary to continue to provide some face-to-face socialization in traditional classroom settings.

### **Videoconferencing a Mock Trial**

The use of active learning strategies is not bound by time, place, or distance. The use of videoconferencing technologies has been used in teaching distance-learning courses in western New York.

Students in Jamestown and Buffalo, New York read an article in the paper about the liability of an insurance company in the death of a patient who was denied treatment. They were encouraged to access the actual legal briefs and took part in a mock trial, using videoconferencing technologies. The students in Jamestown represented the insurance company (defendant) while the Buffalo students represented the family (plaintiff). Each group had approximately 20 minutes to present its side of the case over the span of 3 hours. The presentation used questions, answers, and rebuttals from both sides. The excitement of the mock trial format sparked student creativity and excitement. It increased the opportunities for socialization between two groups of students, which would not normally have occurred without the technology.

### **Practice Skills**

A variety of practice skills were also incorporated as active learning strategies. The following examples illustrate the use of technology to cultivate professional skills.

#### ***On-line Testing***

In preparation for the NCLEX, students were given on-line testing experiences to familiarize themselves with a computerized test-taking environment. Two computerized quizzes were developed within the framework of a course management system. Students received a brief orientation to the use of the computerized testing function prior to completing the mini quizzes. Students had both positive and negative comments about using technology for test taking, although most acknowledged the need to practice computerized testing prior to taking the NCLEX.

Faculty recognized that unfamiliarity with the computer environment might cause additional anxiety during test taking. This orientation may serve to better prepare students and improve their success. Once the initial shock of taking tests on-line receded, students were generally positive about the instant feedback for answers and test scores. They also appreciated being allowed to take the exam at any time or in any place. In addition, this experience also prepares students for completing on-line continuing education, competency testing, and the possibility of participating in on-line master's degree courses.

#### ***Preparing for Employment Using Technology***

In preparation for employment, senior nursing students use several active learning, technology driven strategies, which are incorporated in the final leadership course prior to graduation. On-line posting of student resumés and videotaped practice interviews are two examples. Students are required to work with personnel from the Office of Career Planning and Placement and a faculty member to hone and refine their resumé prior to posting it on-line. The resumé is posted on-line at a site of the student's choosing. Students are amazed at the number of recruiters who contact them for interviews. All students received at least one contact from a recruiter. Thus far, using this approach, three students have actually accepted a position out of the state. Videotaped and critiqued interviewing practice is also employed as an active learning strategy. Students must make an appointment with the interviewer, come prepared with their resumés, and wear business attire. While being videotaped, they answer structured, simulated, clinically-oriented questions. Their answers should demonstrate past performance and be indicative of future performance. Upon completion of the videotaped interview, the student's performance is critiqued by the person from the Office of Career Planning and Placement who conducted the interview. Students have consistently praised the value of this assignment.

#### ***Patient Simulation***

The nurse anesthesia and acute care practitioner programs use state-of-the-art advanced simulation technology, e.g., the full-body, computer-controlled mannequin (SAMSON) to support surgical and resuscitative patient care. Using the full-body, computer-controlled mannequin fosters experiential learning and accurate event documentation, provides a realistic environment, suspension of disbelief, and facilitates debriefing. The technology also includes an operating room and critical care environment with monitoring and gas delivery systems. These give students and clinicians from multiple disciplines the opportunity for basic and advanced training in anatomy, physiology, pharmacology, acute management of rare or critical events, and crisis resource management.

Students interact with the simulation device in controlled scenarios. Each scenario, lasting no more than 15 minutes, focuses on a single objective. Students are assigned roles for each scenario, which allows them to experience the same scenario from multiple perspectives. For instance, each nurse-anesthesia student not only plays the role of principle anesthetist but also of circulating nurse, consultant, and observer. After each session, the students are debriefed in a room separate from the simulation room. This debriefing always maintains a positive perspective, thus offering students a greater chance of learning and retaining the objective for that scenario.

There are several advantages to using a full-body, computer-controlled mannequin in nursing graduate education. There is no patient risk during training, students can follow through on emergencies and

rare events (such as hyperthermia), which helps them develop decision-making and critical-thinking skills. Different patient scenarios, such as exploratory laparotomy, difficult intubation, and total knee replacement focus on a single objective. In the future the Simulation Center may be used to expose undergraduate students to the operating room and critical care environments prior to their clinical experiences.

### ***Videoconferencing Family Nurse Practitioner (FNP) Student Clinical Evaluations***

Videoconferencing technology is used to conduct clinical evaluations of FNP students in an emergency department urgent care setting. This effectively replaces onsite faculty clinical evaluations. The effectiveness of videoconferencing to evaluate a student's clinical performance in remote sites—like evaluation of students onsite—is most related to the quality of the interpersonal interface. In

addition, it appears that using technology for clinical evaluation increases the need for sensitive human interactions—verbal and non-verbal—which can illuminate rather than diminish the role modeling of professional behaviors with patients. Videoconferencing offers a viable mechanism to reduce geographic barriers to clinical evaluation and to offer increased opportunities for collaboration between the university-based FNP faculty and the clinical preceptors.

### **Summary**

This article described the inclusion of technology-driven active learning strategies at the UB School of Nursing. Included were descriptions of discussion lists, information portal/database access, critiquing Web sites, Web-based courses, a mock trial, on-line testing, preparing for employment using technol-

ogy, the use of patient simulation technology for nurse anesthesia students, and videoconferencing FNP student clinical evaluations. Technology complements an arsenal of teaching/learning approaches for both faculty and students. Our vision for the future includes placing all undergraduate and graduate nursing syllabi on the Web, increasing the use of on-line testing, expanding videoconferencing student clinical evaluations to all community sites, and increasing skills in electronically mediated communications to include nurse-patient interactions. In addition, we hope to expand the use of virtual reality patient simulations for all students, expand videoconferencing opportunities, and continue integration of evidence based practice into assignments, utilizing the vast amount of information available on Web and databases.

## **REFERENCES**

- American Association of Colleges of Nursing (1999). *White paper: Distance technology in nursing education*. Washington, DC: American Association of Colleges of Nursing.
- American Association of Colleges of Nursing (1999). *Essentials of Baccalaureate Education*. Washington, DC: American Association of Colleges of Nursing.
- Bonwell, C. & Edison, J. (1991). *Active learning: Creating excitement in the classroom*. ASHE-ERIC Higher Education Report No.1. Washington, DC: The George Washington University School of Education and Human Development.
- Mallow, G. & Gilje, F. (1999). Technology based nursing education: Overview and call for further dialogue. *Journal of Nursing Education*, 38(6), 248-251.
- McCartney, P. (2000). Netiquette: maintaining confidentiality and privacy on discussion lists. *AWHONN Lifelines*, 4 (1), p. 28-33.
- McKeachie, W., Pintrich, P., Yin, Y., & Smith, D. (1987). *Teaching and learning in college classrooms: A review of the literature*. Ann Arbor, MI: National Center for Research to Improve Post Secondary Teaching and Learning, The University of Michigan.
- Microsoft. (1995). *Computer Dictionary* (2<sup>nd</sup> edition). Redmond, WA: Author, p.384.
- SUNY Ranked Among Best in the Nation in Information Technology (1999). *PC Weekly*. Retrieved April 7, 1999 from the World Wide Web: [www.sysadm.suny.edu/university\\_relations/newsreel/990406.htm](http://www.sysadm.suny.edu/university_relations/newsreel/990406.htm)

# Nursing Informatics: The Future is Now

*Barbara Carty, EdD, RN*

## ABSTRACT

Nursing informatics is a new and evolving specialty. The potential for specialists in this area of practice to influence the nursing profession, affect healthcare delivery, and participate in the design and development of future healthcare systems is remarkable. This paper explores the nature of nursing informatics, the educational preparation, and the variety of roles within the specialty.

## Health Care in the Information Age

Health care today is a swiftly changing landscape that is dominated by the rapid proliferation of information and communication technology. Health professionals and consumers are navigating new terrain as they communicate, access information, and resolve illness and healthcare issues. No longer is health care confined to the hallowed halls of brick and mortar institutions. Increasingly it is becoming a “point and click” system with leveled boundaries that promotes unfettered public access to healthcare information and untraditional communication between providers and patients.

Health care is dominated by the emergence of enterprise systems, electronic communications, including the computerized patient record (CPR), healthcare portals, and World Wide Web interactions. A recent poll conducted by Harris (2000) found that 68% of on-line adults seek health information, indi-

cating that health care will be strongly influenced by Internet health portals and interactive health information networks. The impetus for this accelerated access to, and availability of, information has been the development and introduction of the World Wide Web into homes, offices, businesses, and healthcare settings. Internet-based healthcare networks linking caregivers and patients provide customized health tools and e-commerce to patients, thus enabling patients to monitor their health status, report health data, access disease prevention information, purchase healthcare products, and influence health outcomes.

With the move from stand-alone hospital information systems to integrated delivery networks, the availability of the types, quality, and amount of information will determine how care is distributed. As health systems move to enterprise-based organizations, the role of consumers, providers, and settings will

interact to produce a more dynamic, interactive environment, which will be dominated by information and data access. This revolution will have profound effects on how health care is delivered, evaluated, and reimbursed. Nurses, who are the major providers of health care in the United States, will have to embrace the technology that is driving much of the change. The evolution of nursing informatics as a specialty has paralleled the rapid advances of information technology. However, nursing informatics continues to be a fairly unrecognized area among healthcare providers generally and nurses specifically. This article will discuss informatics within the context of nursing and present the current education and practice milieu of the specialty.

## The Domain of Nursing Informatics

As with any new and evolving domain, time is needed to develop a research body to support the science and practice. Informatics,

*Carty is a clinical associate professor at New York University, Division of Nursing and Coordinator of the Nursing Informatics Graduate Education Program.*

however, is being swiftly propelled by the accelerated development of information technology and tools that allow for the rapid prototyping of data, information, and knowledge. It is these tools that the nurse informaticist uses to define, manage, and research the data, information, and knowledge of nursing and health care. This engineering and modeling of data, information, and the representation of knowledge are at the core of the informatics specialty. As early as 1989, Graves and Corcoran-Perry defined nursing informatics as the management and processing of nursing data into nursing information, and nursing data and information into nursing knowledge for the purpose of patient care. However, the inextricable association of informatics with technology has served to mystify the specialty and obscure the importance of the data, information, and knowl-

edge concepts. An important aspect of nursing informatics is to express within systems what nurses do, the language of nursing. Brennan (1994) underscores that the distinct body of knowledge that is the discipline of nursing and nursing informatics is expressed in its language. "A discipline produces knowledge that is unique to it. The knowledge, in turn, is evident in the language of the discipline." (p.200). The discipline provides the practitioner with the language necessary to express the phenomena of its practice and differentiates it from other disciplines. As a result, there are within the domain of nursing informatics major efforts to structure the language, define concepts, and map terminology to be represented in systems (Henry, Warren, Lange, & Button, 1998; Bakken, Cashen, & O'Brien, 1999; Bakken, Wade, Bain, Sklar, & Kelber, 2000; Button,

Warren, Bakken, Androwich, & Mead, 2000; Ozbolt, 2000).

Subsequent definitions of nursing informatics incorporate models that expand its domain to include other disciplines, such as computer science, information science, and more recently cognitive science (Turley, 1996). The inclusion of cognitive science has been echoed by Ribbons (1998) in nursing informatics and Patel and Kaufman (1998) in medical informatics. Supporting the interdisciplinary nature of nursing informatics is the American Nurses Association (ANA) definition of nursing informatics as the specialty that "integrates nursing science, computer science, and information science in identifying, collecting, processing, and managing data and information to support nursing practice, administration, education, research and the expansion of nursing knowledge" (ANA,

## A Career Opportunity as a Nursing Informatics Specialist

by Elizabeth Phillip, RN, MSN

My career transition to a nursing informatics specialist began when, as an adult health clinical nurse specialist, I enrolled in the Post-Master Certificate program in Nursing Informatics at NYU.

The certificate program is designed for masters-prepared nurses and includes five courses. Introduction to Nursing Informatics explores the specialty as well as issues, such as data security and confidentiality associated with information management. Two courses focus on all aspects of the information system life cycle. A clinical decision support course investigates more future-oriented uses of clinical information systems. A capstone course requires students to apply and integrate learning from the program into an all-encompassing project and to explore the development of nursing informatics as a specialty. Application of learning is demonstrated in each course through a project related to information systems. The projects I completed included developing a plan for a medication data bank in a home care setting; establishing a database to measure the effectiveness of pressure ul-

cer assessment, prevention, and management strategies; and developing a rules-based clinical decision support program for a fall prevention program in the acute care setting. In addition to these projects, I had over 600 hours of clinical experiences. During that time, I was actively engaged in projects related to healthcare information systems in a variety of clinical settings from home care to the outpatient clinic and the acute care setting.

As a result of completing this program of study, I obtained a position as a Clinical Effectiveness and Quality (CEQ) Coordinator at the Hospital of the University of Pennsylvania. In this role, I am responsible for supporting the clinical effectiveness and quality teams in identification, data analysis, and implementation of CEQ targets. This is accomplished by designing and maintaining databases and as supporting the development of clinical pathways, disease management protocols, and educational materials to aid in their implementation. These job responsibilities reflect the nursing informatics specialist's scope of practice of aggregating clinical data to measure and communicate

outcomes based on that data. I am able to successfully combine my informatics expertise with my clinical knowledge, an important aspect of being successful in nursing informatics.

The Clinical Effectiveness program comprises an interdisciplinary team of professionals with financial or clinical backgrounds. In addition to the database design and management skills I acquired through the informatics program, my role includes representing the nursing profession. This involves verifying that the databases contain and accurately measure data that is sensitive to nursing interventions. Nursing knowledge is used to assure the validity and integrity of data collected and to verify that the correct methodologies are applied when measuring the data. I review queries generated from the databases to make sure that they are designed to provide the correct data that answers the clinical question being asked. My informatics education has enabled me to successfully position myself in a new and exciting role within nursing.

*Elizabeth Phillip is a clinical effectiveness and quality coordinator at the Hospital of the University of Pennsylvania in Philadelphia. She completed the post master certificate program in nursing informatics at NYU. The Division of Nursing at NYU also awards a master degree in nursing informatics.*

p.3, 1994). This ANA definition was an outcome of numerous efforts by national committees and study groups (National Center for Nursing Research, 1993; Graves & Corcoran-Perry, 1989; Heller & Romano, 1988) to support the development of nursing informatics as a specialty within nursing. The ANA Expert Panel on the Scope of Practice (ANA, 2000) proposed a new definition to reflect the expanded roles of informatics nurse specialists (INS) on the graduate level:

Nursing Informatics is a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, and knowledge in nursing practice. Nursing informatics facilitates the integration of data, information, and knowledge to support patients, nurses, and other providers in their decision-making in all roles and settings. This support is accomplished through the use of information structures and information technology (p.20).

The document also outlines the recommended practice, education, roles, and responsibilities of the INS.

### Education for Informatics

Based on the current literature and the nature of the practice environment, it is clear that informatics content needs to be addressed in both undergraduate and graduate curricula. The core informatics content in undergraduate programs will prepare nurses to work in a health care environment that is increasingly information- and computer-driven. The graduate specialization will prepare the developers and designers of the healthcare systems, and assure nursing's participation in a digitally dominated healthcare environment.

### Undergraduate Informatics Education

In 1998, the American Academy of Colleges of Nursing released its document, "The Essentials of College and University Education for Professional Nursing." The document outlines core knowledge and skills related to technology for professional nursing education. These competencies include the ability to: (a) use information technologies to promote professional knowledge, (b) teach patients about information technologies, (c) use information and communication technologies to document and evaluate patient care, (d) adapt the use of technologies to meet patient needs, and (e) use technology to advance patient care and enhance the accessibility of care. Specific undergraduate informatics content has been outlined by Nelson (2000) and is represented in a model that incorporates computer skills, information literacy, and nursing informatics content. Computer skills include the use of a variety of software programs, such as word processing, spread sheets, and database software. Information management knowledge requires proficiency in the use of telecommunications, including email and Internet and bibliographic database searching. Basic nursing informatics knowledge includes nursing taxonomies and language, and various applications of the computerized patient record (CPR).

In addition to supporting core informatics content in basic education programs, undergraduate faculty need to develop their own knowledge, skills, and understanding of computer applications in health care and education.

### Graduate Informatics Specialization

With the identification of nursing informatics as a specialty, the question arises as to how to prepare nurses for this new and evolving role. Studies indicate that graduate education programs and faculty preparation in informatics are in short supply. (Carty & Rosenfeld,

1998; Arnold, 1996). The scarcity of programs on a national level has made it very difficult for nurses to become educationally qualified for this area of practice. As a result, nurses have often had "on the job training" or have obtained graduate degrees in related fields such as computer science, business administration, management information systems, and programming (Carty, 1994; Arnold, 1996). As the roles have expanded and the demand for nurses qualified in this area of practice have increased, more educational programs are emerging. They vary in curricula design, course requirements, and clinical experience. Some graduate programs emphasize the specialist role with a concentration of informatics courses. Other programs integrate informatics content in graduate specialization programs such as advanced practice or administration (American Medical Informatics Association, Nursing Informatics Working Group, available at [amia-niwg.org](http://amia-niwg.org).) The programs that emphasize the master's specialization are the ones most appropriate to prepare the INS.

Graduate informatics education prepares a practitioner who possesses a broad scope of knowledge and skills. The expertise has been promulgated in the ANA draft on "Scope of Practice of Nursing Informatics and the Standards of Practice and Professional Performance for the Informatics Nurse Specialist" (2000, p.21). Performance areas and roles include but are not limited to:

- Employ information systems life cycle and other tools to analyze data, information, and information system requirements;
- Design, select, and evaluate information technology, data structures, and decision-support mechanisms into an integrated information system. These systems support patients, nurses, and their information management and human-computer interactions within health contexts;
- Facilitate the creation of nursing knowledge.

The informatics nurse specialist works with a variety of health care informaticists in an interdisciplinary setting that is constantly challenged by the rapid advances of technology within health care. The specialist possesses a level of clinical expertise and knowledge combined with knowledge of information and systems technology.

### Credentialing for Informatics

Current credentialing by ANA for informatics specifies a minimum of a bachelor's degree, practice as an RN for 2 years, and a minimum of 2000 hours in the field of informatics or 12 credits in a graduate program and 1000 hours in the field of informatics. However, the recent draft of the ANA Expert Panel on the Scope and Standards of Practice for the INS supports graduate education preparation of the informatics nurse. This position was also endorsed by the National Advisory Panel on Nursing Education and Practice (1997). The panel recommended:

- Preparation of advanced informatics nurses;
- Identification of core informatics content;
- Preparation of faculty in informatics;
- Collaboration on informatics projects.

These efforts to clarify and propose a variety of solutions to the often-confusing landscape of nursing informatics have illuminated many alternatives. Nurses who want to qualify for the advanced practice role should be prepared at the graduate level. Nurses who already have a master's degree can qualify with a post-master certificate. Practicing nurses without master's preparation can be certified as a generalist by fulfilling education and practice requirements.

## The Practice of Nursing Informatics

The paradigm shift from a traditional, provider-dominated system to an information, consumer-driven system has left many nurses confounded about the future of health care and their own professional existence. The emergence of informatics as a specialty offers nurses new opportunities in an expanding discipline. As healthcare organizations attempt to implement systems that will sustain their markets, clinicians with informatics expertise are in a win-win situation. Professional prospects abound in the area of system development and design, implementation, and evaluation. Professional opportunities can be found in the private sector as developers and consultants with vendors, in clinical settings as analysts and system designers, and in education as faculty and researchers. Career opportunities are not confined to settings but are portable, and numerous roles can be found in a variety of settings. These role titles may include: nursing information system coordinator, clinical informatics specialist, clinical analyst, vocabulary engineer, clinical database coordinator, healthcare quality improvement and outcomes manager, knowledge engineer, director of clinical information systems, consultant, educator, and researcher (Willson et al., 2000).

As an example, the role of a nursing information system coordinator may vary from setting to setting, but essentially the responsibilities are “to coordinate the analysis, design, development, planning,

testing, training, implementation, maintenance, support, and evaluation of both existing and future hospital clinical information systems” (Willson et al., 2000, p.83). In some settings, nurses may function in only one or two of these areas, such as training and education or systems design and evaluation. In the latter role, they are often referred to as nurse analysts. On a more advanced level, nurses may serve as director of informatics. This role is usually found in a setting that has clearly defined the area of informatics. Nurses in this executive position provide leadership during all phases of the system life cycle, from selection to implementation and evaluation. They usually work with a group of designers and analysts and are part of a larger interdisciplinary team within the organization. Whatever the role a nurse assumes in informatics, the key to success is the clinical knowledge and experience that informs the position.

The flexibility and diversity of nursing informatics career opportunities are attractive to the nurse who enjoys a challenge, can envision novel and exciting opportunities, and is willing to create or define a position. These opportunities are a direct result of the evolution of a networked society and the intense focus on information access and knowledge engineering. Nursing informatics presents an exciting opportunity for nurses to examine their practice, articulate their language, and create new and exciting ways to position their profession.

## REFERENCES

- AACN (1998). *Essentials of baccalaureate education for professional nursing practice*. Washington, D.C. American Association of Colleges of Nursing.
- American Nurses Association (2000) Draft: *The scope of practice of nursing informatics and the standards of practice and professional performance for the informatics nurse specialist*. [On-Line] Available: [nursingworld.org/practice/1207fiel.doc](http://nursingworld.org/practice/1207fiel.doc)
- American Nurses Association. (1994). *Scope of practice for nursing informatics*. Washington, DC: American Nurses Publishing.
- AMIA, Nursing Informatics Working Group. Available: [On-Line] Available: [amia-niwig.org](http://amia-niwig.org)
- Arnold, J. (1996). Nursing informatics educational needs. *Computers in Nursing*, 14 (6), 333-339.
- Bakken, S., Wade, G., Bain, C., Sklar, B., & Kelber, C. (2000). Standardized terminology requirements for nurse practitioner documentation of clinical findings. In V. Saba, R. Carr, W. Sermeus, & P. Rocha (Eds.), *One step Beyond: The Evolution of Technology in Nursing*. 7<sup>th</sup> International Congress Nursing Informatics. New Zealand: Adis.
- Bakken, S., Cashen, M., & O'Brien, M. (1999). Evaluation of a type definition for representing nursing activities within a concept-based terminologic system. In AMIA Proceedings, 1999. CD ROM.
- Brennan, P. (1994). The relevance of the discipline. *Journal of the American Medical Association*, 1 (2), 200-201.
- Button, P., Warren, J., Bakken, S., Androwich, I., & Mead, C. (2000). Development of the loose canon model for nursing interventions. In V. Saba, R. Carr, W. Sermeus, & P. Rocha (Eds.), *One step Beyond: The Evolution of Technology in Nursing*. 7<sup>th</sup> International Congress Nursing Informatics. New Zealand: Adis.
- Carty, B. & Rosenfeld, P. (1998). From computer technology to information technology: Findings from a national study of nursing education. *Computers in Nursing*, 16 (5), 259-265.
- Carty, B. (1994) “The Protean Nature of the Nurse Informaticist.” *Nursing and Health Care*, 4 (4) 174-177.
- Graves, J. & Corcoran-Perry, S. (1989). The study of nursing informatics. *Image Journal of Nursing Scholarship*, 21 (4).
- Harris Interactive Inc. (2000). *Ethics and the Internet: Consumers vs. Webmasters*. Available: [www.ihealthcoalition.org](http://www.ihealthcoalition.org).
- Henry, S., Warren, J., Lange, L., & Button, P. (1998). A review of major nursing vocabularies and the extent to which they have the characteristics required for implementation in computer-based systems. *Journal of the Medical Informatics Association*, 5 (4),321-328.
- Heller, B.R., Romano, C.A., Damrosch, S., & Parks, P. (1985) Computer applications in nursing: implications for the curriculum. *Computers in Nursing*, 3 (1), 14-22.
- Internet Healthcare Coalition (IHC). Proceedings: *Quality Healthcare Information on the Net '99*. New York, October 13, 1999. IHC.
- Kelly, K. (1998). *New Rules for the New Economy*. New York: Penguin.
- National Advisory Council on Nurse Education and Practice (1997). *A National Informatics Agenda for Nursing Education*. Department HRSA. Washington, D.C.
- National Center For Nursing Research. (1993). *Nursing Informatics: Enhancing Patient Care*. (NIH Publication No.93-2419). Bethesda, MD: USA. National Center Nursing Research.
- Nelson, R. (2000). Core informatics: Content for an undergraduate curriculum. In B. Carty (Ed.), *Nursing Informatics: Education for Practice*. New York: Springer.
- Ozbolt, J. (2000). Terminology standards for nursing: collaboration at the summit. *Journal of American Medical Association*, 7 (6), 517-522.
- Patel, V. & Kaufman, D. (1998). Medical informatics and the science of cognition. *Journal of American Medical Informatics Association*, 5 (6), 493-501.
- Ribbons, R. (1998). The use of computers as cognitive tools to facilitate higher order thinking skills in nurse education. *Computers in Nursing*, 16 (4), 223-228.
- Turley, J. (1996). Toward a model of nursing informatics. *Image: Journal of Nursing Scholarship*, 28 (4), 309-313.
- Willson, D., Bjornstad, G., Lussier, J., Matney, S., Miller, S., Nelson, N., Neiswanger, M., Pinto, K., & Thompson, C. (2000). Nursing informatics: career opportunities. In B. Carty (Ed.), *Nursing Informatics: Education for Practice*. New York: Springer.

# Evaluating Health Information on the Internet: Empowering Consumers

*Eileen Hayes Lantier, PhD, RNC*

## ABSTRACT

The public is relying on the Internet for health information at a growing rate. Trends in U.S. health care support personal responsibility, prevention, and health promotion. This article describes how nurses can support consumers by guiding them to reliable Internet resources and empowering them to make discerning choices of their own.

## Internet Evaluation: Nurses Call to Action

The Internet and its graphic interface commonly called the World Wide Web have touched off an information explosion. The Internet is fast, easy to access, anonymous, and relatively inexpensive.

According to the Harris Poll (Taylor, 1999), 70 million Americans went on-line between June 1998 and June 1999 looking for health information. The number of U.S. households with computers reached 51% in August 2000, according to a recent Commerce Department Survey (*Computers in Half of U.S. Homes, 2000*). The Pew Internet and American Life Project found that 55% of all Web users have gone on-line to seek out health-related information, making the activity more popular than on-line shopping or searching for sports

scores and stock quotes. In addition, women tend to visit health and medical sites more than men (Pew, 2000). There is no doubt that this medium is here to stay.

A review of the literature suggests evidence of positive outcomes from select health communication interventions. There is little research reported, however, regarding the risks associated with their widespread use. Inaccurate or inappropriate health information could result in harmful outcomes, such as delays in seeking health care or even inappropriate treatment. Misleading information relative to health products is not hard to find (Eisenberg, 1993; Food and Drug, 1997; Keoun, 1996; Robinson, Patrick, Eng, & Gustafson, 1998). A Federal Trade Commission initiative identified more than 400 Web sites and Usenet newsgroups that contained potentially false or deceptive advertising

claims for products or services for six diseases (North American, 1997). This was accomplished within a few hours time.

Use of the Internet is growing. As nurses, we have the opportunity and the obligation to support our clients in accessing accurate, reliable, high-quality information. We want the public to be better healthcare consumers. Our national health promotion and disease prevention agenda, Healthy People 2010, challenges individuals, communities, and professionals to take specific steps to ensure that all enjoy good health, as well as long life. (U.S. Department of Health and Human Services, 2000.) To that end, the following mechanisms for evaluating health information on the Internet are identified. Each offers a unique perspective, although certain elements are common to all. Commonalties include knowing the source, determining the accountabil-

*Lantier is an associate professor at Syracuse University School of Nursing, Syracuse, NY specializing in educational technology and informatics in nursing and health care.*

ity of the source, and disclosure about the purpose of the site and its stakeholders. Nurses in a variety of practice settings and with a multitude of publics to address can select the guidelines most appropriate for their populations. Sharing these guidelines with clients, using guidelines to select appropriate sites, and being proactive in addressing poor sites at the source, reflect the critical role nurses play in this new area of interactive health communication.

While many individuals and groups have worked diligently to develop guidelines for self-policing of health information on the Internet, five particular efforts are highlighted here. These sites were selected because they were developed by organizations with reputations for integrity, are continually reviewed and updated, have sound advisory boards, and provide a mechanism for user feedback. These guidelines provide a scaffolding, which nurses can use to help consumers craft a personal health plan.

The first of these sites is Healthfinder and comes from the U.S. Department of Health and Human Services. Healthfinder ([www.healthfinder.gov](http://www.healthfinder.gov)) is a free gateway to reliable consumer health and human services information. It is an excellent site from which to begin a consumer's use of on-line health information. The site also provides a free guide to reliable health information (Table 1). The consumer, when assessing the trustworthiness of an Internet site, can use a series of nine questions. The first seven questions require positive responses, while the last two would garner negative comments in a quality site. The Healthfinder site also hosts another evaluation resource called Smart Choices: Evaluating On-line Information ([www.healthfinder.gov/smartchoices/on-lineinfo/evaluate.htm](http://www.healthfinder.gov/smartchoices/on-lineinfo/evaluate.htm)). This is a reference point for 12 hyperlinks, all in some way related to health information evaluation.

Another mechanism to assist consumers comes from a Geneva-based not-for-profit organization called the Health on the Net Foundation ([www.hon.ch](http://www.hon.ch)). This organization maintains the Health on the Net

Code of Conduct for medical and health related Web sites (Table 2). Through a free application for membership, Web developers and site hosts can request a site review for concurrence with the principles of the Health on the Net Code. A site that conforms to these principles can display the Health on the Net seal. Violation of the principles at a future date will result in a loss of the approval seal. While diligent in

*Table 2 Health on the Net Foundation Code of Conduct for Medical and Web sites Principles*

- 1. Authority:**  
Any medical or health advice provided and hosted on this site will be given by medically trained and qualified professionals unless a clear statement is made that a piece of advice offered is from a non-medically qualified individual or organization.
- 2. Complementarity:**  
The information provided on this site is designed to support, not replace, the relationship that exists between a patient/site visitor and his/ her existing physician.
- 3. Confidentiality:**  
Confidentiality of data relating to individual patients and visitors to the medical/ health Web site, including their identity, is respected by this Web site. The Web site owners undertake to honor or exceed the legal requirements of medical/ health information privacy that apply in the country and state where the Web sites and mirror sites are located.
- 4. Attribution:**  
Where appropriate, information contained on this site will be supported by clear reference to source data and where possible, have specific HTML links to that data. The date when a clinical page was last modified will be clearly displayed (e.g. at the bottom of the page).
- 5. Justifiability:**  
Any claims relating to the benefit/ performance of a specific treatment, commercial product or service will be supported by appropriate, balanced evidence in the manner outlined in Principle 4.
- 6. Transparency of authorship:**  
The designers of this Web site will seek to provide information in the clearest possible manner and provide contact and email addresses for visitors that seek further information and support. The Webmaster will display his/her email address clearly throughout the Web site.
- 7. Transparency of sponsorship:**  
Support for this Web site will be clearly identified, including the identities of commercial and non-commercial organizations that have contributed funding, services, or material for the site.
- 8. Honesty in advertising and editorial policy:**  
If advertising is a source of funding, it will be clearly stated. A brief description of the advertising policy adopted by the Web site owners will be clearly displayed on the site. Advertising and other promotional material will be presented to viewers in a manner and context that facilitates differentiation between it and the original material created by the institution operating the site.

*Table 1 Online Information Checklist*

Does the Web site:
<ul style="list-style-type: none"> <li>• clearly state its purpose and sponsors?</li> <li>• separate advertising and sales from health information?</li> <li>• get its information from reliable sources?</li> <li>• keep information up-to-date?</li> <li>• tell you how it chooses to link to other Web sites?</li> <li>• offer a way to contact the people who run the site?</li> <li>• tell you the information it collects about you and how it will be protected?</li> <li>• make outrageous claims?</li> <li>• offer prescriptions or medical advice without licensed health care providers?</li> </ul>
<a href="http://www.healthfinder.gov/smartchoices/on-lineinfo/checklist.htm">www.healthfinder.gov/smartchoices/on-lineinfo/checklist.htm</a>

*Health on the Net Code of Conduct*  
<http://www.hon.ch/conduct.html>

its efforts, Health on the Net makes no claim about the reliability of the information provided by individual sites, but rather allows for self policing by Web site providers to adhere to the code.

The Internet Healthcare Coalition represents a third perspective. They have provided a firm foundation to help consumers evaluate materials found via the Internet. This group of diverse, healthcare parties offers criteria for evaluating the reliability of on-line health information and advice (Table 3).

The fourth evaluation source is a consumer-focused white paper called Criteria for Assessing the Quality of Information on the Internet. A tool based on these criteria, which can help consumers screen health-related sites, is available at: [hitiWeb.mitretek.org/info/projects.asp](http://hitiWeb.mitretek.org/info/projects.asp).

The final source for evaluation discussed in this paper comes from the Science Panel on Interactive Communication and Health Care (SciPICH), convened by the Office of Disease Prevention and Health Promotion of the U.S. Department of Health and Human Services in 1996. Over a two-year period, the panel of experts from a variety of health related domains developed an Evaluation Reporting Template

for Interactive Health Communications Applications (Table 5). The Evaluation Template is available at the SciPICH Web site ([www.scipich.org](http://www.scipich.org)). Users and feedback about all aspects of the template are welcomed. Briefly, the template is divided into four sections: a) Description of the application, b) Formative and process evaluation, c) Outcome evaluation, and d) Background of the evaluators. This instrument is intended for use by developers and evaluators of interactive health communications to help them report evaluation results to potential purchasers or users. This last example is included so that users can appreciate the breadth of the evaluation process regarding health information on the Internet.

### Summary

The Internet is much too vast for any one individual or group to police. There will be health information on the Internet that is not helpful and perhaps even harmful. As nurses, our role is to educate consumers in judicious use of the Internet. By learning about the aforementioned evaluation tools and guidelines, consumers can become better equipped to make the right choices. These tools and guidelines can only be helpful if professionals and consumers are aware of them and use them consistently. Collaborative work toward this end will improve the likelihood of good health and long life for all.

**Table 3** *Tips for Health Consumers*

1. Find a web site that has a person, institution or organization in which you already have confidence. If possible, use several sources.
2. Authors and contributors should always be identified, along with affiliations and financial interests. This means phone numbers, email addresses, or other contact information.
3. Sources that disparage others or claim to be the sole source of information should raise a red flag to the consumer.
4. Don't be fooled by the long list of additional resources in hyperlink format. Anyone can create a hyperlink.
5. Sources used to create content should be clearly referenced and acknowledged.
6. Clinical content needs a date of publication or modification.
7. Ask yourself, "Does the author have anything to gain from proposing one point of view over another?"
8. Avoid online physicians and others who propose diagnosis and treatment without a proper physical examination and consult regarding a medical history.
9. Be sure a privacy statement can assure that any personal medical or other information you supply will be kept absolutely confidential.
10. Use common sense. Shop around and always get more than one opinion. Be suspicious of miracle cures and always read the fine print.

*Adapted from the Internet Healthcare Coalition: Tips for Health Consumers <http://www.ihealthcoalition.org/content/tips.html>.*

**Table 4** *Criteria for Evaluating Internet Health Information*

<b>Credibility</b>	Includes the source, currency, relevance/utility, and editorial review process for the information.
<b>Content</b>	Must be accurate and complete, and an appropriate disclaimer provided.
<b>Disclosure</b>	Includes informing the user of the purpose of the site, as well as any profiling or collection of information associated with using the site.
<b>Links</b>	Evaluated according to selection, architecture, content, and back linkages.
<b>Design</b>	Encompasses accessibility, logical organization (navigability), and internal search capability.
<b>Interactivity</b>	Includes feedback mechanisms and means for exchange of information among users.
<b>Caveats</b>	Clarification of whether site function is to market products and services or is a primary information content provider.

*Criteria for Assessing the Quality of Health Information on the Internet <http://hitiweb.mitretek.org/docs/criteria.html>*

Table 5 Evaluation Reporting Template for Interactive Health Communication Applications, Version 1.0, Science Panel on Interactive Communication and Health

This is an evaluation reporting template for developers and evaluators of interactive health communication (IHC) applications to help them report evaluation results to those who are considering purchasing or using their applications. Because the template is designed to apply to all types of applications and evaluations, some items may not apply to a particular application or evaluation. Complete only those items that apply. This and subsequent versions of the template and other resources on evaluation of IHC are available at: [www.scipich.org](http://www.scipich.org)

**I. Description of Application**

1. Title of product/application:
2. Name(s) of developer(s):
3. Relevant qualifications of developers:
4. Contact(s) for additional information:
5. Funding sources for development of the application (e.g., commercial company, government, foundation/nonprofit organization, individual):
6. Category of application (e.g., clinical decision support, individual behavior change, peer support, risk assessment):
7. Specific goal(s)/objective(s) of the application. What is the application intended to do? List multiple if applicable:
8. Intended target audience(s) for the application (e.g., age group, gender, educational level, types of organizations and settings, disease groups, cultural/ethnic/population groups):
9. Available in languages other than English? No/ Yes (specify):
10. Technological/resource requirements of the application (e.g., hardware, Internet, on-site support available):
11. Describe how confidentiality or anonymity of users is protected:
12. Indicate who will potentially be able to get information about users:

**II. Formative and Process Evaluation\***

1. Indicate the processes and information sources used to ensure the validity of the content (e.g., peer-reviewed scientific literature, in-house “experts,” recognized outside “experts,” consensus panel of independent “experts,” updating and review processes and timing):
2. Are the specific original sources of information cited within the application? Yes/No
3. Describe the methods of instruction and/or communication used (e.g, drill and practice; modeling; simulations; reading generic online documents, interactive presentations of tailored information, specifying methods used):
4. Describe the media formats used (e.g., text, voice/sound, still graphics, animation/video, color):
5. For each applicable evaluation question below indicate (i) the characteristics of the samples used and how they were selected, (ii) the method(s) of assessment (e.g., specific measures used), and (iii) the evaluation results:
6. If text or voice is used, how was the reading level or understandability tested?
7. What is the extent of expected use of the application (e.g., average length and range of time, number of repeat uses)?
8. How long will it take to train a beginning user to use the application proficiently?
9. Describe how the application was Beta-tested and debugged (e.g., by what users, in what settings):

**III. Outcome Evaluation†**

1. For each applicable evaluation question below, indicate (i) the type of evaluation design (I-III),‡ (ii) the characteristics of the sample(s) used and how they were selected, (iii) the method(s) of assessment (e.g., specific measures used), and (iv) the evaluation results:
2. How much do users like the application?
3. How helpful/useful do users find the application?
4. Do users increase their knowledge?
5. Do users change their beliefs or attitudes (e.g., self-efficacy, perceived importance, intentions to change behavior, satisfaction)?
6. Do users change their behaviors (e.g., risk factor behaviors, interpersonal interactions, compliance, utilization of resources)?
7. Are there changes in morbidity or mortality (e.g., symptoms, missed days of school/work, physiologic indicators)?
8. Are there effects on costs/resource utilization (e.g., cost-effectiveness analysis)?
9. Do organizations or systems change (e.g., resource utilization, effects on “culture”)?

**Background of Evaluators**

1. Names and contact information for evaluation(s):
2. Do any of the evaluators have a financial interest in the sale/dissemination of the application? No Yes (specify):
3. Funding sources for the evaluation(s) of the application (e.g., developer’s funds, other commercial company, government, foundation/nonprofit organization):
4. Is a copy of the evaluation report(s) available for review on request? No Yes (how to obtain):

Comments and suggestions regarding the content, scope, utility, and practicality of this template should be directed to: SciPICH, Office of Disease Prevention and Health Promotion, US Department of Health and Human Services, 1200 Independence Ave. SW, Washington, DC 20201 or email comments to: [scipich@health.org](mailto:scipich@health.org).

\* *Formative* evaluation is used to assess the nature of the problem and the needs of the target audience with a focus on informing and improving program design before implementation. This is conducted prior to or during early application development, and commonly consists of literature reviews and reviews of existing applications and interviews or focus groups of “experts” or members of the target audience. *Process* evaluation is used to monitor the administrative, organizational, or other operational characteristics of an intervention. This helps developers successfully translate the design into a functional application and is performed during application development. This commonly includes testing the application for functionality and also may be known as alpha and beta testing.

† *Outcome* evaluation is used to examine an intervention’s ability to achieve its intended results under ideal conditions (i.e., efficacy) or under real world circumstances (i.e., effectiveness), and also its ability to produce benefits in relation to its costs (i.e., efficiency or cost-effectiveness). This helps developers learn whether the application is successful at achieving its goals and objectives, and is performed after the implementation of the application.

‡ Design types are grouped according to level of quality of evidence as classified by the US Preventive Services Task Force and the Canadian Task Force on the Periodic Health Exam. (US Preventive Services Task Force. Guide to clinical preventive services, 2nd ed. Washington, DC: US Department of Health and Human Services, 1996.)

I. *Randomized controlled trials.* Experiments in which potential users are randomly assigned to use the application or to a control group. Randomization promotes comparability between groups. These designs can be (a) double-blinded — neither the participants nor the evaluators know which participants are in the intervention group or the control group, (b) single-blinded — the participants are *not* aware which experimental group they are in, or (c) non-blinded — both the participants and the evaluators are aware of who is in the intervention group and who is in the control group. Greater blinding lessens the chance of bias.

II-1. *Non-randomized controlled trials.* Experiments comparing users and non-users (or “controls”) but they are not randomly assigned to these groups. For this type of design specify how the participants were recruited, selected and assigned to the groups and how the groups compare — similarities and differences between users and non-users prior to the evaluation.

II-2. *Cohort study/observational study.* An evaluation of users with no comparison or control group.

II-3. *Multiple time series.* Observations of participants as they go through periods of use and non-use of the application.

III. *Descriptive studies, case reports, testimonials, “expert” committee opinions.*

<http://www.scipich.org/template/evalintro.htm>

## REFERENCES

- Criteria for Assessing the Quality of Health Information on the Internet, (May 1999). Retrieved May 3, 2001, from the World Wide Web: [hitiweb.mitretrek.org/docs/criteria.pdf](http://hitiweb.mitretrek.org/docs/criteria.pdf)
- Crutsinger, M. (2000, October 17). Computers in half of US homes. *Washington Post* p.E17.
- Eisenberg, D.M. et al. (1993) Unconventional medicine in the U.S.: Prevalence, costs and patterns of use. *New England Journal of Medicine*, 328, 246-252
- Food and Drug Administration. (1997) FDA warns consumers on dangerous products promoted on the Internet. FDA Talk Paper, June 17, 1997. Retrieved May 3, 2001, from the World Wide Web: [vm.cfsan.fda.gov/~lrd/tpiwarn.html](http://vm.cfsan.fda.gov/~lrd/tpiwarn.html)
- Health on the NET Code of Conduct. Retrieved May 3, 2001, from the World Wide Web: [www.hon.ch/conduct.html](http://www.hon.ch/conduct.html)
- Information Quality Tool, (June 23, 2000). Retrieved May 3, 2001, from the World Wide Web: [hitiweb.mitretrek.org/iq/](http://hitiweb.mitretrek.org/iq/)
- Internet Healthcare Coalition. Retrieved May 3, 2001, from the World Wide Web: [www.ihealthcoalition.org](http://www.ihealthcoalition.org)
- Keoun B. (1996) Cancer patients find quackery on the web. *Journal of the National Cancer Institute*, 88, 1263-5.
- North American Health Claim Surf Day Targets Internet Ads. [press release] Washington, DC: Federal Trade Commission: November 5, 1997. Retrieved May 3, 2001, from the World Wide Web: [www.ftc.gov/opa/1997/9711/index.htm](http://www.ftc.gov/opa/1997/9711/index.htm)
- Pew Internet and American Life Project: The Online Health Care Revolution: How the Web Helps Americans Take Care of Themselves. Released Nov. 26, 2000. Retrieved May 3, 2001, from the World Wide Web: [www.pewinternet.org/reports/toc.asp?Report=26](http://www.pewinternet.org/reports/toc.asp?Report=26)
- Robinson, T.N., Patrick, K., Eng, T. R., & Gustafson, D. For the science panel on interactive communication and health. (1998) An evidence-based approach to interactive health communication: A challenge to medicine in the information Age. *The Journal of the American Medical Association*, Vol. 280 (14); 1264-1269.
- Science Panel on Interactive Communication and Health. (1999) *Wired for Health and Well-Being: the Emergence of Interactive Health Communication*. Eng, T.R., Gustafson, D.H., editors. Washington, DC: U.S. Department of Health and Human Services, U.S. Government Printing Office, April 1999.
- Smart Choices: Evaluating Online Information. Retrieved May 3, 2001, from the World Wide Web: [www.healthfinder.gov/smartchoices/onlineinfo/evaluate.htm](http://www.healthfinder.gov/smartchoices/onlineinfo/evaluate.htm)
- Taylor, H. (1999). Explosive Growth of Cyberchondriacs Continues. The Harris Poll #47, Aug. 5, 1999. Retrieved May 3, 2001, from the World Wide Web: [www.harrisinteractive.com/harris\\_poll/index.asp?PID=117](http://www.harrisinteractive.com/harris_poll/index.asp?PID=117)
- Tips for Health Consumers. Retrieved May 3, 2001, from the World Wide Web: [www.ihealthcoalition.org/context/tips.html](http://www.ihealthcoalition.org/context/tips.html)
- U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion (November 2000) "Healthy People 2010." Retrieved May 3, 2001, from the World Wide Web: [www.health.gov/healthypeople/](http://www.health.gov/healthypeople/)

## INFORMATION FOR AUTHORS

### Journal of the New York State Nurses Association

11 Cornell Road, Latham, New York 12110

Phone: 518-782-9400, Ext. 275

Managing Editor: Anne Schott

#### Editorial Policy

The *Journal of the New York State Nurses Association*, a biannual, peer-reviewed publication, welcomes submission of scholarly papers, research studies, brief reports of clinical or educational innovations, and articles of opinion on subjects important to registered nurses.

The *Journal* is especially receptive to the work of new authors. Manuscripts of up to 20 pages, including tables and references, will be considered.

All manuscripts should be original, unpublished work not being reviewed elsewhere.

#### Manuscript Preparation

The *Journal* follows the guidelines of the *Publication Manual of the American Psychological Association*, Fourth Edition, 1994. Please consult this APA manual for appropriate style, detailed information on formats for different types of manuscripts, and the presentation of references, tables, and figures.

Submit an original and three copies of the manuscript, typed on 8½ X 11 paper, double spaced, using margins of at least 1¼ inches. Include an abstract of the article (approximately 50 - 150 words).

Include a title page with the name and credentials of all authors as they should appear in the *Journal*. Also include all authors' primary professional affiliation. For example: *Mary Jones, MSN, RN. Jones is a clinical nurse specialist in oncology at University Hospital in Hometown, NY.*

#### Permissions

Authors are responsible for requesting any permissions needed for the use of copyrighted material such as tables, charts, forms, and figures. Letters of permission should be submitted with the manuscript.

#### Editing

The editors reserve the right to edit all manuscripts to comply with style and space requirements. Edited copy is submitted to the authors for approval.

#### Checklist for Authors

- ✓ Four copies of article, double spaced.
- ✓ Copies of tables, figures, and reference list included in all four copies.
- ✓ Full name, credentials, and institutional affiliation provided for all authors.
- ✓ Abstract of article
- ✓ Written permission to reproduce any previously published material.
- ✓ Indicate name of author to whom correspondence should be addressed; include phone and fax numbers, and e-mail address.
- ✓ If you wish your manuscript returned, include a stamped, self-addressed envelope.

# WHAT'S NEW IN THE

## Technology in Nursing

**Wilson, F., Baker, L., Brown-Syed, C., & Gollop, C. (2000). An analysis of the readability and cultural sensitivity of information on the National Cancer Institute's Web site: CancerNet. *Oncology Nursing Forum*, 27 (9), 1403-1409.**

The purpose of this study was to ascertain the level of reading skills required by lay people who access patient-related cancer information through CancerNet, the Web site of the National Cancer Institute (NCI), and to assess the cultural sensitivity of the information targeted to certain ethnic groups. The study was a descriptive, repeated measures design. The Web site setting was NCI's CancerNet (cancer.net.nci.nih.gov). A convenience sample of 49 documents from the CancerNet Web site was analyzed. The methods involved analyzing the readability of each document using the Flesch-Kincaid readability formula. Using Bloch's Ethnic/Cultural Assessment Tool as a guide, a content analysis of the ethnic-related documents was performed to determine the cultural sensitivity of the information. The findings indicated that the overall mean reading level was 12<sup>th</sup> grade, and that little variation existed in the cultural content of the information even though several ethnic groups were targeted. The authors concluded that information on CancerNet needs to be modified to meet the information needs of people with low reading skills and to make the information more culturally sensitive for various ethnic groups. There are several implications for nursing practice. Finding successful methods for educating patients and families is a primary responsibility of oncology nurses. Information can play a vital role in helping patients to engage in self-care behavior. Therefore, nurses must be knowledgeable about the readability, usefulness, and cultural sensitivity of information on cancer Web sites so that they can guide patients to appropriate Internet resources.

**Bush, N., Wooldridge, J., Foster, V., Shaw, K., & Brown, P. (1999). Web site design and development issues: The Washington State breast and cervical health program Web site demonstration project. *Oncology Nursing Forum*, 26 (5), 857-865.**

The purpose of this project was to explore the development of a customized Web site to assist Breast and Cervical Health Program (BCHP) outreach staff in a community screening program and to evaluate the Internet knowledge and access issues and barriers to outreach staff during a two-year period using the Web site. The data was collected by descriptive questionnaires. A comprehensive cancer center setting in Seattle, WA, includes workshops and presentations around the state. A sample of healthcare professionals included BCHP outreach workers, screening coordinators, and almost exclusively public health nurses from regional health districts and program-contracted clinics. The methods involved in Web site development are based on continuous input from the sample. Detailed descriptions of computer and Internet resources and opinions about the use and usefulness of the BCHP Web site came from a 1996 evaluation and 1998 follow-up, conducted using mailed and on-line Web questionnaires. "Hits" to the Web

site were monitored monthly. Computer and Internet resources were used, along with monthly Web site traffic and opinions about the use and usefulness of the BCHP Web site in the outreach program. The findings indicated that use of the BCHP Web site has risen steadily over two years to reach a stable plateau. User evaluations showed a marked increase in the adoption of the Internet as a working tool. Users believe the Internet is becoming increasingly important to their work. More training and familiarization with the Web is needed. The authors conclude that the Web is an efficient medium for improving communication and providing easy access to resources within the BCHP program. The implication for nursing practice is that public health programs with meager resources can benefit from the relatively inexpensive use of customized and versatile Web sites.

## Nursing Education

**Kennerly, S. (March/April 2001). Fostering interaction through multimedia. *Nurse Educator* 26 (2), 90-94.**

The author discusses the need for interactive learning and the use of multimedia in assisting in this process. She notes the stages of technology use by faculty in their teaching. For example, faculty may begin employing technology for such tasks as grading and progress to assigning students to use the Internet for on-line, out-of-class discussion. It is made clear that by using different types of multimedia (e.g., computers, Internet, Web sites, and video conferencing), educators can expand their teaching strategies to foster student learning. A table identifying examples of outcomes, strategies, the multimedia environment, and the interaction process is provided. One example is for the outcome "cultural sensitivity." Based on a specified health problem, students are assigned "to locate health resources to meet the culturally specific needs of a patient who is part of an identified cultural group." Examples of the resources students used may include a CD-ROM, audiotape, chat room or the World Wide Web. The interaction that takes place in this situation is between learner and content.

**Potempa, K. Stanley, J., Davis, B., Miller, K.L., Hassett, M.J., & Pepicello, S. (January-February, 2001). Survey of distance technology use in AACN member schools. *Journal of Professional Nursing*, 17 (1), 7-13.**

The responses of 365 nursing schools regarding their use of distance technology were reported. All respondents were members of the American Association of Colleges of Nursing. Six major areas were surveyed: (a) distance education in the parent institution, (b) distance education in the school of nursing, (c) information technology in the school by the dean, the faculty, and the students, (d) information technology in the nursing curriculum, (e) barriers to the use of technology in nursing education, and (f) partnerships with other departments, schools, businesses, and organizations. Data are reported for each of the six areas. Almost 3/4 of respondents indicated that the parent institution was involved in distance education; slightly more than half reported offering distance education courses in their school of nursing. Seventy-seven percent of respondents indicated that faculty were developing technology-based education materials. Within

# NURSING LITERATURE

---

the past 5 years, there has been a sharp increase in the number of courses and programs offered through technology-based distance-education methods. One reason for using distance technology was to improve access to nursing education for certain groups of students, e.g., older worker students with family responsibilities.

## Nursing Practice

**Miller, E. T., Deets, C., & Miller, R. V. (2001).** Nurse call and the work environment: Lessons learned. *Journal of Nursing Care Quality*, 15 (3), 7-15.

This article contains a comparison of nursing time and user friendliness of two nurse call systems in a large metropolitan hospital. The old call system consisted of a master station, outside room dome lights, and call devices from the patient bed, bathroom, and shower. The new call system consisted of a master station, room station, locator badges, corridor lights, and bathroom and bed call interface units. Data showed that the new call system resulted in savings of nurses' time after the call was answered by the unit secretary. A worker less skilled than an RN could probably have answered 50% of the calls with the new system. This report provides information that could be used to increase RN productivity while improving the practice environment.

**Willoughby, D., & Burroughs, D. (2001).** A CNS-managed diabetes foot-care clinic: A descriptive survey of characteristics and foot-care behaviors of the patient population. *Clinical Nurse Specialist*, 15 (2), 52-57.

This study highlights the need for foot care of people with diabetes. Although 69% of the surveyed patients reported corns, calluses, or other foot deformities, 54% of those not attending the clinic and 13% of clinic attendees reported that their feet were examined by their primary care provider on each visit. Those patients attending the foot clinic were more likely to have special shoes (57% compared with 0 of non-attendees), less likely to go barefoot (25% compared with 60% of non-attendees), less likely to treat a lesion themselves (2% compared with 20% of non-attendees), and less likely to wait for a lesion to get better (6% compared with 13% of non-attendees). The small sample size of this study does not allow for generalizations beyond the sample, but provides valuable information for the nurse to use in caring for people with diabetes, regardless of the practice setting.

**Paterson, B.L. (2001).** The shifting perspectives model of chronic illness. *Journal of Nursing Scholarship*, 33, (1), 21-26.

Nurses who work with clients with any chronic illness can find this article useful. From a synthesis of a base of 292 qualitative research studies describing how people experience chronic illness, the researchers developed a model that challenges the linear, predictable trajectory models that have previously been offered. Instead, the Shifting Perspectives Model proposes that chronically ill people live in a constantly changing duality of experience, shifting from illness-in-the-foreground, where sickness, suffering, loss, and burden predominate, to wellness-in-the-foreground, where change in relationships with environment, with others, and with oneself are viewed as pos-

sible, creative, normal, and meaningful. What shifts the focus from one perspective to the other was found to be personally defined threats to control and the resolution of those threats. A rich and interesting discussion of the findings, the paradoxes inherent in these experiences, and the usefulness of this model for working with chronically ill persons follows.

**Tilden, V.P., Tolle, S.W., Nelson, C.A., & Fields, J. (2001)** Family decision-making to withdraw life-sustaining treatments from hospitalized patients. *Nursing Research*, 50 (2), 105-115.

The purpose of this study was to assess levels of family stress associated with decisions to withdraw life-sustaining treatments, to assess factors that affected stress, and to compare families and clinicians on their reasoning about the decision. Findings of the study indicate that stress levels for family members were extremely high; substantial levels of stress persisted even six months after the patient's death. The most important factor increasing stress levels was the absence of patient advance directives. While both clinicians and families consider the patient's values and preferences in their decision-making regarding life-sustaining treatments, families were more likely than clinicians to want everything medically possible to prolong the patient's life, particularly in the absence of patient advance directives.

## Nursing Workforce

**Greenberg, M. (2000).** Where will I go? Displaced nurses relate their experiences. *Nursing Leadership Forum*, 5 (1), 9-18.

Nurses who have found themselves reassigned to a new unit or a new position, laid off or terminated, or who are concerned about these possibilities will be interested in the report of this qualitative study, which describes the experience of change from the perspective of 13 displaced nurses. The author used a grounded theory methodology to analyze the data. Five themes emerged: finding out, weighing options, coping with negative emotions and loss, support, and giving advice. Excerpts from the data and discussion of the findings enrich this article, making it particularly useful for managers who may be involved with employees in these situations, as well as affected nurses themselves.

## Public Health

**Wenger, L., Malone, R., & Bero, L. (2001).** The Cigar Revival and the Popular Press: A content Analysis, 1987-1997. *American Journal of Public Health* 91(2), 288-291.

A content analysis of 790 cigar-focused newspaper and magazine articles was the method used to examine print media coverage of cigars during the period 1987 to 1997. While health advocates and health professionals have effectively increased awareness of the hazards of cigarette smoking, this study suggests that they have been less successful in challenging industry portrayals of cigars. Cigar-focused articles have increased over the study period, consistent with the increase in cigar consumption. Only 4% of the articles focused on the health effects of cigar smoking. Failure to communicate the health risk has contributed to the positive images of cigars.

## A Nurse Pioneer in the Use of the Internet: Interview with Dr. Virginia Duffy

*Sharon Bidwell-Cerone, PhD, RN, CS-PNP*

### INTRODUCTION

Since 1998 Virginia Duffy, PhD, RN, CS-PMH, NPP, in conjunction with business partner Mary Couillard, PhD, RN, CS-FNP, has owned and operated the Web site [www.NotJustYourDoctor.com](http://www.NotJustYourDoctor.com), which aims to provide expert health information for consumers and professionals alike. Dr. Duffy is a certified psychiatric mental health advanced practice nurse who works as a psychotherapist and consultant in Rochester, New York. Dr. Couillard is a certified family nurse practitioner who works in South Carolina in a school-based practice. Each of these nurses has over 30 years professional experience, including teaching at the university level and authorship of professional papers. Dr. Duffy is the author of “Nurse Entrepreneurship: Potential, Plausibility, and Prospects,” which can be found in *The Nursing Profession, Tomorrow and Beyond*, edited by Norma Chaska and published by Sage in 2001.

### What motivated you to create your Web site?

My partner and I talked for some time about how we could work together even though we do not live near one another. Our Web site business is essentially an adventure that suited our professional interest in gaining access to the public so that we could use our expertise. We have been working on this project for two years. We were quite “green” at the outset, starting with not knowing how to create a Web site. Eventually we determined that hiring an expert to perform that function was the way to go, but our creative input was required at every step of the process. The Web site has been up and running for almost a year now.

### What can be found on your Web site?

There are five main ingredients to the Web site. First, the reader finds an introductory segment that describes who we are. Second, there is an explanation about the service we provide. Third, a sample of the type of work we do is displayed. Fourth, the customer is provided with instructions about our fees and methods to access us. Fifth, we feature a bulletin board where health information is provided free, and viewers are invited to comment. Since information is our service, fees are linked to the amount and complexity of the answers we provide to customers’ questions. We charge \$15 for a basic answer, \$30 for a complex one, and \$350 for 12 months of service (10 basic and 10 comprehensive answers).

*Bidwell-Cerone is a pediatric nurse practitioner at the Anthony Jordan Health Center in Rochester, New York.*

*“There is always tension between wanting to please and not wanting to give service away.”*

We also sell “information sheets” on common health topics. Our orientation is integrating conventional and alternative approaches to health.

### **What type of questions do you answer on your Web site?**

So far the questions can be categorized as either too embarrassing for customers to discuss with others and too difficult or time consuming for customers to research themselves. For example, we have fielded questions on premature ejaculation, bumps on the back of the throat, and allergy products that are available in America but not in England.

### **What is the impact of your service?**

This is very difficult to know. We offer to answer a free follow-up question (pertaining to the original question) for all customers, and always ask customers to let us know how they are doing. So far, no one has responded to our offer for the free follow-up question. It is important to understand that we do not advertise our service as a clinical practice per se, but rather as a source of information only. We are careful not to make any sort of diagnosis. Disclaimers explain that our service is not a substitute for conventional health care, but a supplement to what is already available to them. We are aware that currently there are unresolved issues associated with practicing nursing across state lines. Our answers are carefully worded with all these things in mind.

### **What is your competition on the Internet?**

There are many health information Web sites out there. In fact, the evidence indicates that consumers seeking health care information account for one of the largest categories of Internet users. In addition to our own business, we work collaboratively with [www.NursingHands.com](http://www.NursingHands.com), which provides career information, chat rooms, and answers to questions raised by professional nurses. This Web site advertises our services and in return I answer some questions for them free. We have an agreement not to work with a similar site while we are affiliated with them.

### **What are the financial implications of a business like yours?**

So far the only financial investment we have made is the \$1,500 needed to pay the Web master to get the site up and running. We do not expect to make a profit for a while, especially since this is only a part-time venture. We have no expectations of getting rich from it. However, there is some potential for significant remuneration through selling products, contracting with other groups, and building up archives of questions that can be customized as needed. If there are enough hits on our Web site a company could be motivated to advertise with us. However, we are a long way from having those numbers. It would be fair to say that no one has found the secret for generating significant profit in this type of business. On the contrary, a number of health information Web sites have gone out of business because they incurred such high startup costs.

We have struggled with appropriately pricing our service. For example, some questions require more information than the basic answer the customer paid for, and sometimes multiple questions come imbedded within one. Some individuals try to circumvent the payment mechanism which requires compliance with our questionnaire. There is always tension between wanting to please and not wanting to give service away free. However, our biggest business concern at this is time getting more people to access the Web site.

### **What do you think of Internet businesses for nurses?**

We love what we are doing with [NotJustYourDoctor.com](http://NotJustYourDoctor.com) from both business and professional points of view. Besides having a great time, we feel as if we are really “out there” interacting with the public and having a positive impact on their lives. The business is evolving every day, which necessitates that we continually learn new skills. For example, I have had to learn something about Web site building in order to avoid paying for Webmaster services on an ongoing basis. In essence, our work is gratifying because we are moving boundaries and changing perceptions of what nurses can do.

## Book Review

---

Warren G. Hawkes, MLS

Institute for the Future. (2000). *Health and Health Care 2010: The Forecast, the Challenge*. San Francisco, CA: Jossey-Bass Publishers.

“Make an educated guess.” That is something that we all have been asked to do from time to time. Now imagine that you have been asked to make an educated guess about the future of health and health care in the United States to the year 2010. Considering the number and complexity of variables, as well as the number of unknowns, this is no small task. Yet that is what the Robert Wood Johnson Foundation has asked of the Institute for the Future (ITF).

Founded in the late 1960s, the Institute focuses on applied research in complex organizational environments, ranging from the non-profits to government and the for-profit sectors. To increase the reliability of their prognostications, ITF divided the 10-year time frame into two segments – 2000 to 2005 and 2005 to 2010. For the 2000 to 2005 time frame, analysts believed that the systems/policies currently in place provided an adequate information base to make predictions with a moderate degree of reliability. ITF presents its data analysis and predictions through 10 broad categories: demographics/disease, healthcare demand, insurance, providers, workforce, medical technologies, information technologies, consumers, public health, and health behaviors.

Each category is given a chapter that provides comprehensive trend-based policy analysis, as well as related longitudinal data covering the 1980s and 1990s. In addition, because of potential volatility, each chapter ends with a cluster of “wild cards” that would completely alter the equation. For example, a “wild card” in the chapter related to healthcare demand addresses the possibility of a severe

recession with the need for increased dollars to support the increased need for indigent health care. In the provider-related chapter, a potential “wild card” would be an epidemic or new disease that would require a rapid increase in available hospital beds. Noted as unlikely occurrences, “wild cards” offer us some insights into the complex interrelationships of our health care delivery system.

For the period 2005-2010, the Institute for the Future is less comfortable about making predictions, so they have presented three possible versions of health care that may evolve. ITF labels these versions (a) Stormy Weather, (b) The Long and Winding Road, and (c) The Sunny Side of the Street. Although not discussed in as great detail as the other topics, comparative data related to number of uninsured, per capita health expenditures, and spending as a percentage of Gross Domestic Product are provided. One should note, however, that despite the optimistic tone implied by “The Sunny Side of the Street,” the forecast is that 30 million Americans will be uninsured.

This is a well-conceived and well-executed report with comprehensive endnotes and primary sources. However, readers should remember that data offer only a snapshot perspective, not truth. For in the chapter on the healthcare workforce, based on data from the Division of Nursing, Department of Health and Human Services, the Institute predicts, “The future supply of RNs is expected to be sufficient to respond to these increased demands...”

So much for prognostication.

*Hawkes is director of the NYSNA library.*

New York State Nurses Association  
11 Cornell Road  
Latham, New York 12110-1499