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## Integrating Telehealth in Nursing Curricula: Can You Hear Me Now?

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### Abstract

Distance learning methods were used to advance faculty knowledge and skills in telehealth across nursing programs at five campuses. As the culmination of a year of faculty development, telehealth content was infused into the curriculum by a team of faculty from each campus who developed and implemented a course assignment on telehealth. Assignments were developed for the following nursing courses: Theoretical Foundations of Nursing, Community Health Nursing, Nursing Management and Leadership, Health Assessment, and Nursing Research. Telehealth assignments, communication methods, training activities, and evaluation outcomes are described.

**Keywords:** telehealth, informatics, nursing education, collaboration, healthcare technologies





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## FEATURE ARTICLE

### Introduction

“Can you hear me now?”—a phrase made popular by a phone service advertisement—aptly illustrates the new wave of technology-based health care called Telehealth.

Telehealth is using telecommunication technology in the delivery of health-related services and electronic information (e.g., clinical services, health education). Telehealth services range from phone monitoring to more complex options such as transmission of video images and patient data to health care providers (Vasquez, 2008). Nurses generally are the health care point of contact, serving as a patient monitor for this new and exciting technology. Telehealth equipment allows the nurse to respond to changes in a patient's status with interventions that are directly related to the patient's condition, while the patient remains at home. Managing the patient's symptoms on a daily basis in the home provides quality care and enhances patient outcomes (DelliFraine & Dansky, 2008). Early detection of disease and monitoring of patients by telehealth has been found to also reduce health care costs (Sorrells-Jones, Tschirch, & Liong, 2006). Knox and Mischke (1999), for example, found that implementation of telemonitors with home health visits by clinicians reduced the length of stay (LOS), re-hospitalization, and emergency room (ER) visits for congestive heart failure (CHF) exacerbations.

The Health Resources Services Administration recommends expanding telehealth as a way to improve patient care and patient access to health care providers. An expanding aging





OJNI

## FEATURE ARTICLE

population, increased prevalence of chronic disease, and rising hospital costs require new ways of monitoring patients to prevent the cycle of emergent care visits and additional hospitalizations.

Most states fund telehealth research or infrastructure/program development (Brantley, Laney-Cummings, & Spirack, 2004).

**N**ursing faculty have little knowledge of telehealth and limited time or opportunity to learn about this new way of delivering care. Faculty at the novice or advanced-beginner levels are being asked to teach information technology integrated with nursing knowledge and skills to students who will use these technologies in their jobs (McNeil et al., 2003). Faculty experience a “novice-to-expert flip”; that is, they are experts in their specific field, yet move to being novices when dealing with new technologies (Skiba, 2007). Such a shift creates great uncertainty among faculty.

How can nursing faculty become engaged to learn about telehealth? How can faculty add telehealth to the overburdened nursing curriculum? This article details how the University of Wisconsin (UW) System nursing schools built a model to educate nursing faculty in new technologies and, specifically, how telehealth content was infused in the nursing curriculum. In an effort to assist faculty in learning about telehealth, the five nursing degree-granting institutions of the UW System collaborated to provide training on informatics and telehealth. The partnership was supported by U.S. Department of Health and Human Services/Health Resources and Services Administration (HRSA) grant. The HRSA has instituted faculty development initiatives to support





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## FEATURE ARTICLE

faculty endorsement with new health care technologies.

### **Designing a Model for Faculty Education across Five Campuses**

The five UW nursing programs were interested in shaping faculty development around informatics, telehealth, and technologies. A collaborative training model was developed to build faculty knowledge and skills and to reduce redundancy in the training process. The five institutions designed a structure to facilitate primarily distance training activities addressing a) leadership and faculty teams, b) communication methods, and c) specific strategies to integrate content in the curriculum.

Each of the nursing campuses was assigned a year as designated leader for a faculty development topic devoted to some aspect of informatics over the five-year length of the grant. These topics were identified by the principal investigators based on campus interests and expertise as well as new emerging areas of informatics. Each campus, in its year as designated leader, was responsible for training and resources on the identified topic. Each campus was required to develop a team of six faculty, known as *scholars*. A campus team leader was appointed at each institution. Scholar teams from all five institutions participated in the activities, provided by the lead institution. Each team further disseminated information on the topic to other faculty at their respective campuses, thereby expanding the points of contact.

Communication logistics were important to the success of this project. Keeping five





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campus teams involved and active in the project required establishing a plan of communication—both internal and external. Internal communication responsibilities were divided between leaders of the project and scholar teams on each campus. Campus leaders had monthly audio conferences dealing with budgets, project year planning, and evaluation and external dissemination of projects. Emails were sent twice a month. Leaders received one set of e-mails that kept them up to date on information regarding the grant and items of interest in informatics. Emails to scholars were sent twice a month to inform them of upcoming video conferences, new trends in informatics, and articles related to the topic of the year. Monthly brown bag video conferences connecting all the sites provided a sense of collaboration as well as learning. Field experts on the topic were connected to the group by videoconference, providing a rich educational activity. A Web site, designed and used by the scholars, contained content, discussion threads, announcements, articles, and meeting minutes.

### **Telehealth Training and Its Infusion in the Curriculum**

The major content area for the first year of the grant targeted informatics and telehealth. The lead campus held monthly brown-bag videoconferences and a three-day conference to introduce faculty to various aspects of informatics and telehealth. Conference topics included nursing informatics and how it supports telehealth/telenursing activities; placement of telehealth in the context of nursing practice and health informatics; secondary use of data, terminology, privacy, commercial and experimental telehealth applications; and ethical, legal, and social issues





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## FEATURE ARTICLE

surrounding telehealth. Telehealth monitoring devices were introduced and demonstrated as well. Upon committing to being a part of the team, scholars were informed that their team was responsible to develop and integrate a course assignment with the online collaborative RN to BSN completion curriculum during the telehealth and informatics content year. Team leaders strongly encouraged the assignment to be developed for a core nursing course versus an elective nursing course. The course assignments were intended to build on nursing informatics telehealth/telenurse competencies developed by the American Nurses Association. These competencies included communication, assessment, and consultation skills, along with understanding and establishing policies, and research, evaluation, and documentation skills (American Nurses Association, 1999).

### *Establishing a Therapeutic Relationship in a Telehealth Environment*

In the Theoretical Foundations of Nursing Practice course, faculty scholars developed an assignment using Peplau's Interpersonal Relations in Nursing Model with telehealth monitoring equipment. Required course reading included an online lecture, an article on Peplau's theory, and information on the Health Buddy, a remote telehealth monitoring device. The Health Buddy "talks to" the patient (i.e., texts questions on the monitor screen), and the patient responds by keying in information or button choices. Students reviewed a health management program script within the Health Buddy for a selected chronic condition (e.g., congestive heart failure) and completed the interactive demonstration using this monitoring device. Students were then required





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## FEATURE ARTICLE

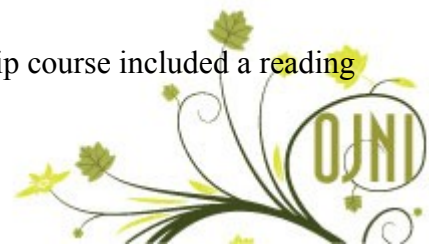
to develop a series of questions and answers that could be programmed into the Health Buddy to promote interpersonal relations between the telehealth nurse and the patient. Questions and answer choices were written in a format similar to the demonstration activity with answer choices and branches dictated by patient responses. Student questions and answer choices in the decision tree focused on all three phases of the interpersonal relationship according to Peplau's theory (i.e., orientation, working, termination).

**A** discussion board was used to facilitate interaction among students about the experience of working with the Health Buddy and to elicit opinion about how the telehealth environment promotes or hinders interpersonal relations.

### *Critically Analyzing the Use of Telehealth Applications*

In the Community Health Nursing didactic course, students reviewed telehealth materials (e.g., article, Medicaid Web site on telehealth coverage) and telehealth links demonstrating how clients could be monitored both in the home and in gathering places such as senior citizen center. Students then discussed the advantages (e.g., less drive time) and disadvantages (e.g., variable lighting to examine wounds) of telehealth compared with traditional home health visits (e.g., face-to-face consultation). Completion of quiz questions on telehealth was also part of the course assignment.

An assignment for the Nursing Management and Leadership course included a reading





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## FEATURE ARTICLE

from the journal *Nurse Leader* on the use of telehealth technologies across the continuum of care. A structured group discussion followed on how telehealth is currently being used by health care organizations to improve patient care and how students' own health care setting could incorporate telehealth care.

### *Recognizing and Addressing Privacy and Ethical Issues*

**T**he Health Assessment course focused on telehealth competencies important in establishing a therapeutic relationship with a client at a distance and adjust the communication technique to maximize the nurse-client relationship while meeting privacy concerns. Students were instructed to conduct an interview of an older client using some form of technology (e.g., telephone, e-mail exchange, instant messenger, online survey) and then to conduct a face-to-face interview covering the same content. The assignment required students to compare information gathered from each method, to describe the implications for practice, and to reflect on security/privacy issues. Additionally, it required students to reflect on how variations, such as literacy levels or loss of visual cues, influenced the interview. This hands-on course activity creates a rich opportunity for student exchange and discussion about their experiences.

### *Evaluating Telehealth Outcomes*

The Nursing Research course included telehealth content in an assignment aimed at





OJNI

## FEATURE ARTICLE

developing research critiquing skills. Students chose from a topic from an instructor-provided list and then completed a literature search on their chosen topic. Telenursing was one of the topics listed. Students were directed to select and critique five scholarly articles from peer-reviewed journals and present a summary of their findings and recommendations for nursing practice using PowerPoint slides with voiceover. An e-reserve list provided to students contained several excellent research reports on telehealth.

### **Creating a Telehealth Training Facility**

**A** unique component of the first-year project was the “telehealth room” used to demonstrate telehealth monitoring. The room is designed to replicate a living room with a couch, recliner, computer, coffee table, side table, pill containers, a walker, and area rug. Also included in the room is a HealthHero telemonitor. Additional equipment is aligned with the HealthHero, including a scale, a blood pressure cuff, and a pulse oximeter. Students are given a case study involving a home health visit that requires them to set up the devices. Students demonstrate how to teach a patient about telehealth remote monitoring and how to use each of the devices to monitor the patient’s health condition. Students then return to the simulated office and are shown how to monitor the patients. Students are given a problem where they need to apply their knowledge of telehealth monitoring. They review a patient history and examine the monitoring reports. They are required to use clinical decision making on what next steps need to be taken in





OJNI

## FEATURE ARTICLE

light of patient data. Planning is under way to add additional equipment to the HealthHero system, such as monitoring of blood glucose, fluid status, PT/ INR, peak flow meter, ECG, and spirometer.

### **Evaluating Impact**

**A**n online assessment of faculty informatics and computer competencies was developed as part of this HRSA grant both as a baseline measure and ongoing evaluation method throughout the five year grant. This 45 item Informatics and Computer Self-Assessment survey, based on the work of Stagers, Gassert and Curran (2001), measures six competency areas: computer knowledge, computer skills, computer usage, informatics knowledge, informatics skills, and informatics usage using a five point Likert scale (1 = none; 5 = high knowledge, skills or usage). Additionally, student and faculty comments on telehealth were solicited and used as a means of informal evaluation.

The average informatics and computer competency self assessment score for the Informatics and Telehealth scholars (N = 26) prior to faculty development activities was 2.5 on a five point scale or 52.02% (i.e., an average of 117 out of 225 available points). At the end of the faculty development year, the average informatics and computer competency self assessment score was 3.2 on a five point scale or 63.55% (N=24). Overall gain scores showed improvement at post-test in all six competency categories with gains greatest on informatics competencies (versus





# OJNI

## FEATURE ARTICLE

computer competencies). However, the range of individual change was -20 to 112 with an average gain score of 25.58 points. Three scholars had a lower self-assessment scores post professional development activities (Scores were -1, -11 and -20); two of these scholars were among the highest initial scores. Professional development activities may have broadened their scope of the content causing them to re-evaluate their competence level downward.

**T**wo items were selected from the Informatics and Telehealth Competencies Assessment and individually analyzed because they related strongly to telehealth (Table 1). Participants showed an increase in informatics skills with systems as evidenced by an improved average score after the faculty development year and all participants reported some degree of proficiency in their informatics skills related to systems (all scores above 1) (Item 27). Participants also showed improvement in their use of informatics knowledge with systems as evidenced by an increased average score post faculty development (Item 42).





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**Table 1**

**Pre and Post Informatics and Computer Competencies  
Assessment Scores on Selected Items**

<b>Competencies Assessment Survey Item</b>	Pre (N = 26) Average Score (range)	Post (N = 18) Average Score (range)
<b>Informatics skill re: systems (e.g., clinical care including telehealth and clinical documentation systems) (Item 27)</b>	2.23 (1-5)*	3.22 (2-5)*
<b>Use of informatics knowledge re: systems (e.g., clinical care including telehealth and clinical documentation systems) (Item 42)</b>	2.38 (1-4)**	3.22 (1-5)**

\*5 point Likert scale ranging from no proficiency [1] to very proficient [5]

\*\* 5 point Likert scale ranging from Never [1] to Daily [5]

Scholars applied their new knowledge and skills in designing and implementing a course assignment into the online RN to BSN program curriculum. Design and implementation





# OJNI

## FEATURE ARTICLE

challenges were few with teams of scholars collaboratively designing the course assignments with a high level of enthusiasm. One minor issue in implementation was the rare instance where the faculty member teaching the course was not a scholar at the time and thus not involved in the design of the assignment. In such situations, telehealth training to the instructor prior to implementation was required. The inclusion of informatics and telehealth assignments in the five core courses has persisted and faculty continue to modify the assignments over time building on their experience with the assignment and student learning outcomes.

**S**tudent reactions to telehealth and informatics readings and discussions were varied. One student noted that “Telehealth is a fascinating new realm of nursing” and another opined that, “...health promotion and health maintenance are going to be the number one issue as the number of chronic health problems rise. There is going to be an increased need for health monitoring and symptom management that can be provided by computer mediated content.” However, some students expressed concerns about implementing telehealth exemplified by the following quote, “I am a nurse that really focuses on interpersonal relationship with all of my patients and their families. I feel that this is the key to patient care, understanding, and healing. A relationship formed with the patient goes a long way with education and compliance from the patient/family upon discharge.” She continued noting, “If a relationship is formed between a nurse and a patient prior to using the telehealth technique, it may be encouraged to remain for as





# OJNI

## FEATURE ARTICLE

long as necessary once the patient is home and computer mediated interaction is put to use. The lines of communication formed during face to face may be continued once the patient is home. I feel a combination of face to face and telehealth would best serve the patient, family, and the nurse.” And many other students have recognized the need for a balance between the desire for ongoing face-to-face relationships and the reality of high transportation costs, uneven access to specialized health care, and the high time investment on the part of patients and health care professionals to receive and provide care. As one faculty member, reflecting on students’ reactions to informatics and telehealth readings and discussions noted , “...opinions vary on telehealth, but when it is taught as an adjunct to care, versus a replacement to care, students are much more comfortable and eager to implement [it] into their own practice.”

### Conclusion

**T**elehealth applications are proliferating, and nursing faculty need to be on the cutting edge of this technology in order to educate the next generation of nurses. The collaborative structure and activities described build a motivated cadre of nursing faculty equipped with knowledge and skills in telehealth technologies. When patients ask, “Can you hear me now?” we can clearly say, “Yes.”





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## FEATURE ARTICLE

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