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## An Undergraduate Research Fellowship Program to Prepare Nursing Students for Future Workforce Roles

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### Abstract

It is important for nurses today and for those joining the workforce in the future to have familiarity and training with respect to interprofessional research, evidence-based practice, and quality improvement. In an effort to address this need, we describe a 10-week summer research program that immerses undergraduate nursing students in a broad spectrum of clinical and translational research projects as part of their exposure to advanced nursing roles. In doing so, the program increases the ability of the students to participate in research, effectively interact with academic medical center researchers, and incorporate elements of evidence-based practice into future nursing interventions. Their mentors are nurses practicing in roles as nurse researcher, advanced practice nurses involved in evidence-based practice or quality improvement, and clinical trials research nurses. Each student is matched with 3 of these mentors and involved in 3 different projects. Through this exposure, the students benefit from observing multiple nursing roles, taking an active role in research-related activities participating in interdisciplinary learning experiences. Overall, the program provides benefits to the students, who demonstrate measured improvement with respect to the program objectives, and to their mentors and each of the participating organizations.

### Index words

Nursing workforce; Research fellowship; Research training; Undergraduate education; Translational research; Evidence-based practice

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Health care policy experts predict that, in the future, nurses will have an expanded role in guiding how care is delivered and improved. To meet these needs, the nursing workforce will not only require an increased number of nurses but also the acquisition of new skills and competencies demanded by an evolving health care environment. Despite recent evidence of a substantial increase in the number of people entering the nursing profession, there are growing expectations that there will be shortages in the primary care workforce (American Association of Colleges of Nursing (AACN), 2014; MacLean et al., 2014). Auerbach, Staiger, Muench, and Buerhaus (2013) suggest that growth of the nursing workforce must continue to increase by 20% per decade for the next two decades in order to meet the challenges presented by health care reform.

To a larger extent, however, the predictions arise from a developing awareness of the central and expanded role of nurses in effective population health management, requiring implementation of standardized, high-quality, targeted interventions that are built upon the best research available (Curley & Vitale, 2011), taking advantage of the unique role nurses play in translational clinical research (Hastings, Fisher, & McCabe, 2012). The sustainability of improvement in patient outcomes depends on the skills of health professionals in practice and those entering the workforce (Armstrong, Headrick, Madigosky, & Ogrinc, 2012). To be prepared for these expanded roles, nursing students and practicing nurses need to attain the requisite competencies in the conduct of research, evidence-based practice (EBP), and quality improvement (QI) as part of their training and educational preparation.

Educational preparation at the baccalaureate level and greater has been shown to be related to positive patient outcomes (Aiken, 2014; Kutney-Lee, Sloane, & Aiken, 2013).

The 2010 Institute of Medicine Report: *The Future of Nursing: Leading Change, Advancing Health* made numerous recommendations for how nurses could play an increasingly important role in future health care delivery. In particular, it specifically recommends that health care organizations and nursing education programs expand opportunities for nurses to “lead and manage collaborative efforts with physicians and other members of the healthcare team to conduct research and to redesign and improve practice environments and health systems.” (p11). The report also recommends that, by 2020, the number of nurses with doctoral degrees should double in order to expand the quantity of available nurse faculty and researchers.

This sentiment is echoed in a recent (2015) AACN survey of 714 schools of nursing, which reported that, during that year, 1,236 full-time faculty positions were left unfilled. Sixty-eight percent of schools indicated that faculty recruitment was limited by the pool of candidates prepared at the doctoral level, and 20% cited difficulty finding faculty willing/able to conduct research. At the same time, while these reports and recommendations are being made, the driving forces in health care also dictate that the capacity for research by nurses expand in breadth and depth. To address this problem, it is crucial that nursing students be encouraged to consider research roles. Even further, nurses and nursing students should be encouraged to consider advanced study and research paths earlier in their careers,

given the opportunities for greater research productivity and longer careers in which to make contributions to the scientific basis of nursing (AACN, 2006).

In line with the evolving needs of the nursing profession, there has been interest in exposing undergraduate nursing students to a more intense and realistic research experience. Of those reported in the literature, the experience is most frequently set within the academic environment. D'Souza, Dwyer, Allison, Miller, and Drohan (2011) described how Wesley College improved the research experience for all students on campus, whereas others Reutter et al. (2010) and Burkhart and Hall (2015) described efforts to enhance research education within the context of a baccalaureate nursing program. Wheeler, Hardie, Schell, and Plowfield (2008) described the mutual benefit to students and faculty of a mentored research immersion experience. These programs occurred over the course of one or two college semesters and potentially spanned 2 years of the program curriculum. In all four, students reported an increased capacity for and interest in research. Two studies Reutter et al. (2010) and Burkhart and Hall (2015) reported that students who participated in the research immersion experience expressed interest in entering graduate programs in the future.

Other efforts to expose nursing students to research have involved experiential approaches, whether in clinical or university settings alone or as part of collaborative efforts between academic and clinical partners. Henoeh et al. (2014) evaluated an experiential approach to involving nursing students in clinical research and found that learning styles were related to differences in student interest in research after participating in a data collection experience in a hospital setting. Kain, Hepworth, Bogossian, and McTaggart (2014) described an intensive university-based summer research experience for undergraduate nursing and midwifery students that led to four observations: (a) students acquired new research skills; (b) it was necessary for faculty to set and explain expectations for the experience; (c) faculty mentors based their support and supervision upon the students capabilities; and (d) it created excitement and interest in research for students participating in the program. Jamerson, Fish, and Frandsen (2011) described a unique academic-clinical collaboration between nursing schools and a pediatric hospital. This program, in which students spend 4 hours per week over a semester on an assigned project, was completed within the traditional academic year. In contrast, academic-service partnerships for nursing undergraduate programs are common, and 40% of the partnerships include some research focus (De Geest et al., 2013). This includes summer research programs for undergraduates in which nursing students are employed as full-time interns to work on faculty research projects and receive research training (Cepanec, Clarke, Plohman, and Gerard (2013). Using this format, students reported increased research skill development and interest in pursuing graduate school in the future.

All of the programs described above were initiated by academic institutions and emphasized research fully within the academic setting or with limited research exposure in a clinical setting. The programs often rely on the expertise of doctor of philosophy (PhD)-prepared research faculty to work with students on academic projects. Organized this way, the academic faculty act as research mentors and role models, and the projects are typically part of an academic course or faculty research effort.

In contrast to previously reported programs, in this article, we describe an intense, immersive research experience structured within a clinical setting and sponsored by a clinical organization. Specifically, this novel summer research program developed at Dartmouth–Hitchcock Medical Center, an academic medical center in New Hampshire, exposes nursing students to research in the clinical environment as conducted by nurses in advanced roles and as part of interdisciplinary teams. Relying exclusively on clinical nurses in advanced roles to serve as mentors to the undergraduate nursing students is an innovative aspect of this program and helps socialize students to the importance of incorporating research into their practice and provide role models for nurses at all professional levels involved in research. In addition to working with their nursing mentors, interactions with basic and clinical researchers further introduce students to the wide range of possibilities for future graduate education and career pathways. Having this experience occur as part of a paid summer research experience is also unique and addresses a need identified by Reutter et al. (2010) to create a summer practicum experience where students could be employed while engaged in clinical and research activities.

## Program Overview and Goals

The summer undergraduate research fellowship program described here is a competitive, 10-week immersion experience designed to expose a select cohort of high-achieving nursing students to nurses in advanced roles who are involved in clinical and translational research. Mentorship of the students is provided by master's- and doctorally prepared clinicians in the medical center. Students are actively involved in selected research and EBP projects with additional experiences, seminars, and observations planned to complement their academic preparation and relate to future career interests.

The primary goal is to increase the number of recent graduate nurses who pursue career pathways and graduate education focused on nursing research, EBP, and QI. We believe that, by introducing nursing students to the advanced roles of nurses and research experiences in their education, they will pursue graduate studies earlier in their careers. These nurse “scientists” will expand the capacity for nursing research within the organization and the region and, on a more global level, will be prepared to educate and guide nursing practice in the future.

## Program Funding

The development of this undergraduate nursing research program was made possible largely through a funding partnership between two National Institutes of Health (NIH)-sponsored research development and infrastructure programs at the Geisel School of Medicine at Dartmouth. The first, the New Hampshire IDeA Network for Biomedical Research Excellence (NH-INBRE), is supported by an Institutional Development Award from NIH and is designed to increase biomedical research capacity and expertise in New Hampshire (<http://nhinbre.org>). The NH-INBRE is unique among INBRE programs in supporting a clinical nursing research cohort as part of its summer undergraduate research program. This innovative, combined program brings together upper-level nursing students from undergraduate institutions in New Hampshire who are interested in research and provides

them with exposure to and interactions with undergraduate students interested in basic science research. The second source of support is SYNERGY, a clinical and translational science institute at Dartmouth supported by a Clinical and Translational Science Award (CTSA) from the NIH. SYNERGY (<https://synergy.dartmouth.edu/>) promotes clinical and translational research through resource development, in addition to research training, mentoring, and career development. This includes providing support and resources for faculty and staff conducting clinical and translational research. The funding from these two complementary programs was used to provide students with housing, a food allowance, and a summer stipend equivalent to full-time employment. The funding also covered conference expenses and poster costs for students and mentors and salary/time for clinically based mentors. A third source of funding support was institutional support from DHMC, which provided the program coordinator, meals at lunch meetings, and computers for student use during the summer.

## Program Description

The INBRE Summer Undergraduate Research Fellowship in Nursing (ISURF-N) program was designed by a steering committee composed of master's and doctorally prepared nurse researchers, QI nurse specialists, clinical nurse specialist mentors, clinical trials research nurses, and nursing administrative staff at DHMC and the chair of the nursing department at a nearby undergraduate institution. The committee established learning objectives and designed the program in the first year and made revisions to the program each subsequent year after reviewing evaluations from students and mentors. At the time of this writing, the program has run for 5 years.

The ISURF-N summer research fellowship is a 10-week intensive immersion program facilitated by a program coordinator. Each year, small cohorts of students (three to five) were selected from the undergraduate nursing programs at partner institutions in the statewide NH-INBRE network, which included two small liberal arts colleges and one state university. Students were primarily rising seniors or, in a few exceptional cases, rising juniors. The program intentionally sought rising seniors because of the preference for those who had already taken a research course as part of their academic program and the expectation that they would have basic research competencies. Program content was designed to build upon, through mentored experiential learning, the knowledge and skills that students had received at their own academic institutions.

Students were selected by members of the steering committee based on their application, academic achievement, faculty recommendations, and an expressed interest in pursuing graduate research training in the future. During the program, students received financial support, a food allowance, and housing in a college dormitory. Students were expected to spend at least 40 hours/week on program activities, which encompassed both daytime and evening commitments.

The program was designed to expose students to three very different clinically based nursing roles involved in research, including (a) nurse researcher, (b) advanced practice nurses involved in EBP or QI, and (c) nurses involved in clinical trials research. Mentors were

prepared at the master's or doctoral level, except in the case of the clinical trial research nurses who were prepared at the baccalaureate level. Each student was matched with three different mentors for the summer, one for each of the three nursing research roles. See Table 1 for the specific learning objectives for each role. The depth of engagement in research with each mentor reflected the levels of research competency described in the *AACN Position Statement on Nursing Research* (2006) and selected competencies described in the *Essentials of Baccalaureate Education for Professional Nursing Practice* (AACN, 2008).

When at all possible, students were matched with mentors based on their stated future interests. For example, a student interested in pediatrics was assigned to work with a PhD-prepared nurse researcher on a research project involving children in the ambulatory setting and a master's-prepared pediatric clinical nurse specialist on an EBP/QI project in the inpatient setting. Together, the students with their mentors decided on one project that would culminate in a poster presentation at a regional meeting.

Representative examples of these projects are listed in Table 2. Given the limited time of a 10-week experience, students participated in established projects that were designed and approved prior to the summer, allowing students to accelerate their involvement in the implementation and evaluation phases. Projects often involved interdisciplinary teams and spanned not only the breadth and depth of nursing practice in an academic medical center environment but also included projects that were priorities for the organization. Students became an integral part of the teams while at the same time “owning” a part of each project. Responsibilities included conducting literature reviews; collecting data through chart review of the electronic health record, interviews, and audits; assisting in developing and administering surveys; participating in data analysis; and creating data displays and presentations to staff. Students also had the opportunity to co-author abstracts for conferences, posters, and papers with their mentors.

For the clinical trials component of the program, students participated in a 1-week observational experience coordinated by a clinical trials research nurse in the Norris Cotton Cancer Center at DHMC, a National Cancer Institute designated Comprehensive Cancer Center that encompasses prevention, clinical treatment, and basic science research. This experience entailed shadowing nurses involved in implementing and coordinating all of the phases (I through IV) of clinical trials, including identifying potential research participants, witnessing the informed consent process, and providing nursing care to participants. During this immersion experience, the students also met with the investigational pharmacist and attended “tumor board” meetings.

In addition to the three major components of the program, experiences were designed to take advantage of the vast opportunities available in an academic medical center and college environment. Students individually met with the research librarian to discuss their projects and receive one-on-one assistance with doing literature searches and exploring the library resources available to them. The constructs of research ethics were embedded into the program in several ways. Students completed the on-line Human Subjects Research certificate program through the Collaborative Institutional Training Initiative Program (<https://www.citiprogram.org/>). They attended an organizational institutional review board

meeting with the clinical nurse specialist who is a member of the committee. In preparation, they conducted an in-depth review of a study protocol assigned to the clinical nurse specialist. Students also attended the bioethics committee meeting and, in addition, team meetings, seminars, and clinical grand rounds. Additional experiences for each student were tailored to their individual research projects and personal interests including, observations of ongoing scientific studies, surgical cases, and team meetings arranged by their mentors.

Students attended several ISURF-N program meetings each week. Weekly “Research Roundtables” were designed for the students and focused on research, EBP, QI, and professional topics. These roundtables were open to all nurses in the medical center. Special sessions such as the panel discussion, “Pursuing a DNP/PhD degree,” were consistently well attended by staff nurses. The program coordinator also held a weekly “huddle” with the students prior to the research roundtables. This provided a scheduled time to monitor student status on multiple projects, identify problems, address scheduling changes, and provide guidance and advice as needed. In addition to these meetings, the students worked in an autonomous role and met regularly with the mentors guiding their two major projects, and also with the clinical trials research nurse coordinating their clinical trial experience. Ad-hoc meetings with the program coordinator also occurred, as necessary, to assist students with data analysis and poster development.

As part of their program, the nursing students participated in a number of activities with basic science students participating in the NH-INBRE ISURF program. In addition to living in the same college dormitory and participating in group social and extracurricular activities, the nursing students attended the groups' weekly graduate record examination preparation sessions and practiced and studied with the basic science students prior to taking the graduate record examination at the end of the summer. They also met weekly for an interdisciplinary journal club facilitated by a research scientist. In this setting, nursing and basic science students read and discussed primary research articles on a wide variety of topics. Inserted into these two weekly meetings were other research-associated activities created for the students, including sessions that provided advice and strategies for applying to graduate programs. Under the guidance of a bioinformatics researcher, students worked through a series of computer-based activities that introduced them to different aspects of bioinformatics research. These activities all contributed to the creation of a culture of scientific exchange that reached beyond the typical nursing student experience, and students noted that this was a positive component of the nursing research program.

The ISURF-N program provided several opportunities for students to present their projects to larger audiences. As part of each student's specific experience, they presented their findings to their nursing and physician team members. In addition, each student created a scientific poster of one of his or her mentored projects to present at the annual statewide meeting of the NH-INBRE program. Attending the conference was a unique opportunity for the nursing students to participate in a multidisciplinary scientific meeting and to interact with basic science students from all the participating institutions. They learned more about the “bench” aspects of science that drives clinical practice. At the end of the summer, students collaborated on the design and presentation of a special session of nursing grand rounds at the medical center. The event was open to the organization's nursing community,

faculty from their home institutions, members of the project team from the basic sciences, and others interested in research in the organization. Through all of these activities, students gained expertise in working on a group project and presenting (often for the first time) to a professional health care audience.

### Program Participants

During the first 5 years of the program, there were 20 undergraduate nursing fellows (17 female and 3 male). Cohorts consisted of three to five students per summer. Most participants (90%) were rising seniors, with two rising juniors accepted based on exceptional recommendations from the department chair of their home institution. There were 10 research mentors and 10 EBP/QI mentors. Of those, mentors were PhD or DNP prepared ( $n = 8$ ), MSN prepared ( $n = 11$ ), or MPH prepared ( $n = 1$ ). In addition, the clinical trials research nurses and staff nurses on project teams were BSN prepared or in graduate school. Mentors participated from 1 to 5 years based on their availability and applicable projects.

### Program Evaluation

The program was evaluated by two entities. Overall program evaluation was conducted by the Center for Program Design and Evaluation at Dartmouth. As the evaluators for the entire NH-INBRE program, they provided in-depth evaluation of the program through pre/post surveys of all participants, focus groups at the end of the summer, and follow-up of all NH-INBRE student researchers postgraduation. The program coordinator in nursing administration conducted specific evaluation measures related to the nursing program. Evaluation included students' weekly reflections, feedback during weekly huddles, post program surveys of learning objectives and program activities, and a final group evaluation session involving the nursing students and mentors.

Formative and summative evaluations provided a means of keeping the program nimble and responsive to the needs of the students and mentors and taking advantage of opportunities as they arose. The information provided during the weekly "huddles" and a brief on-line survey that asked students targeted questions about their experience, provided the program coordinator and mentors with ongoing feedback. For students, it was also of interest to see how much they accomplished each week.

Summative evaluations of the ISURF-N Program included an on-line survey that consisted of a 5-point Likert-type scale for the students to rate (a) the degree to which they were able to meet each of the learning objectives and (b) how beneficial/useful each of the additional experiences, such as weekly roundtables, grand rounds, and extra activities, were for them. Additional comments were categorized by themes. Evaluations were consistently positive for the learning objectives and the additional experiences provided.

On the last day of the program, a farewell breakfast and evaluation session was held in which students, mentors, and the program coordinator reviewed the summary of students' surveys and discussed suggestions for improvements in the program. In addition to this targeted evaluation, interdisciplinary focus groups composed of both basic science and nursing students were conducted to discuss the overall summer program. Each year, the NH-



INBRE leadership and ISURF-N nursing program teams reviewed the results from the focus groups to make improvements when planning the program for the next year.

Numerous benefits of this summer nursing research program have been identified by the ISURF-N program participants. As described below, quantitative and qualitative data have demonstrated positive outcomes to the students, mentors, and organization and, as a result, to patients.

### **Benefits to the Students**

Students were extremely positive in their feedback about the personal and professional value of this program. For many, it was a “life-changing” experience. One student reported that her initial career goal was to participate in laboratory-oriented research, but as a result of her involvement in the program, she decided that her impact would be greatest if she focused on QI in a clinical role. She is now a staff nurse on a medical-surgical unit, is involved in research and QI projects, has participated in an inpatient clinical trial, and recently completed her master's degree in nursing.

In addition to achieving the learning objectives identified for the program, students found that there were opportunities to make meaningful contributions to data analysis and project implementation decisions and to see the outcomes of their work. For example, in an investigation of pediatric surveillance monitoring using continuous pulse oximetry, the painstaking process of collecting data on default alarms resulted in establishing new defaults, a decrease in monitor alarm frequency, and improved patient safety. Over the course of the summer, students witnessed some of the challenges of conducting research in the actual setting of full-time clinicians while also being exposed to the benefits of mentorship and teamwork in accomplishing project goals. This hands-on experience varied greatly from the controlled conditions of their academic research projects with college faculty.

One project in the program exemplifies the iterative nature of bench-to-bedside research. Over the course of several years, an epilepsy program study, “Continuous Pulse Oximetry and Nursing Care for Epileptic Patients,” expanded beyond improving the quality of care for inpatients. Subsequent initiatives branched off from this to include collaborative studies with basic scientists and engineers to develop new technologies for that same patient population. Three of the students involved with the studies during that time expanded their insight into using a comprehensive multidisciplinary approach to research solutions for clinical problems.

Often, students continued working with their program mentors after the summer program had ended. Several continued their projects as part of their senior “capstone experience” required by the nursing program at their institutions. Others, working with their mentors, coauthored articles for scholarly journals (Logan, Correia, McCarthy, & Slattery, 2014), submitted abstracts for conferences and meetings, and/or were invited back to participate in further discussions of ongoing research projects.

During the program, students developed specialty knowledge that reflected their immersion in a clinical setting with a focused topic. In a project that involved pressure ulcer prevention in pediatrics, one student became knowledgeable about wound and skin assessment and prevention, developed an intervention, and provided education to the staff nurses. This knowledge has been a valuable addition to the student's senior practicum at her home institution.

To date, all students desiring employment at the medical center postgraduation have been hired there, which is a benefit to both the students and the organization.

### **Benefits to the Mentors**

Mentors reported that the benefits of working with students in the ISURF-N Program were immediately apparent. Involvement in planning the summer program provided a rare opportunity for nurses from a variety of diverse specialty areas to collaborate and for expert nurse researchers to reach out to the novice members of the nursing staff. As the summer began, the bright spark that nursing students provide was immediately evident. In particular, for nurse researchers who seldom have contact with nursing students, the presence of undergraduate nursing students brought a charge of energy and vitality.

Perhaps the greatest benefit for mentors was increased productivity in accomplishing research, EBP, or QI project goals. Mentors received significant assistance with data collection, study planning, and dedicated, focused research time over the course of 3 months. For example, under the guidance of one nurse researcher (a nurse practitioner in outpatient clinical practice), two students conducted a chart audit of 400 patients over the course of a summer. The opportunity to collect such a volume of data, allowing for several projects, would have been very difficult without this crucial student involvement.

For another mentor (a clinical nurse specialist) whose QI project was related to pressure ulcer improvement in pediatrics, the student's involvement spanned a wide range of QI activities. The student reviewed charts, interviewed staff nurses, and entered and analyzed data. Interrater reliability was established with the wound and skin expert nurse and unit-based staff nurses. Reliable data were then used as a focus for the education provided by the student to staff members on proper pressure ulcer assessment and prevention strategies. The student's contribution to the unit QI initiative demonstrated the mutual benefit to the clinical nurse specialist in improving unit-based patient outcomes and the student's own learning and development.

### **Lessons Learned by Mentors**

Summative evaluations conducted among mentors illuminate several important aspects of the program's design that should be emphasized. Having clinical release time, in our case grant-funded by the NH-INBRE and SYNERGY programs, enabled mentors to spend time with the students and is perceived as critical to making the program work. Acknowledging the demands of each mentor's clinical work environment ensures that mentors are able to find the experience satisfying and remain committed to future involvement.

Mentors found that students who were most successful in the program were highly motivated individuals who were trustworthy, displayed initiative with projects, demonstrated a high degree of accountability, and were able to work autonomously. In nearly all cases, the students demonstrated these traits, and mentors recognized that these are among the primary qualities to look for in future applicants.

One of the most important lessons learned by mentors was the importance of including the student in the many aspects of the clinician's practice early in the program. This allowed the students to witness the clinical context of the research before delving into data collection. Frequent contact throughout the summer maintained this sense of shared perspective and led to consistent interpretation of the data and direction of the study.

### **Benefits to Participating Institutions**

There are several benefits of the program to the participating institutions. During the summer, students working under the guidance and direction of their mentors have been able to provide dedicated time to work on projects of priority to the medical center. These added resources have had a direct impact on improving patient care, an important goal shared by this medical center and many other health care organizations. After graduating from their nursing programs, the organization has continued to benefit from these students. With the exception of two students (including one who went directly to graduate school), the medical center has hired all of the nursing research fellows into the new graduate nurse residency program. These students come to the organization with research, EBP, and QI skills not usually seen in new nurses.

Another benefit of this research program to all participating institutions has been the active and enhanced relationships that have developed between them and the spread of research activity that has occurred as a result of the program. When students have continued their research or QI projects for their senior practicum projects, they not only have engaged faculty mentors at their schools but they also have maintained relationships with their medical center mentors. In the context of expanding the capacity for research in the state, this scholarly activity has helped stimulate research at the partner institutions and the ongoing development of research collaborations between groups at the medical center and nursing faculty at the partner colleges.

Finally, another important benefit of the program has been the increased research productivity and visibility of the participating institutions. In the past 5 years, the nursing students in the program have been coauthors with their mentors and other team members on more than two dozen poster and podium presentations at local, regional, and national nursing and health care conferences. In addition to the steady increase in the number of these presentations over the past few years, the impact and importance of the venues has increased, with students now beginning to appear as coauthors on research articles published in peer-reviewed journals (Caller, Chen, Harrington, Bujarski, & Jobst, 2014; Logan et al., 2014). Many have continued their interest and involvement in research either through active involvement in organizational initiatives or through completion or pursuit of a master's degree in nursing.

## Conclusion and Future Implications

We believe that the ISURF-N program described here is an innovative approach that introduces nursing students to the critical link between the bench and the bedside and develops the enthusiasm and skills necessary for the nursing workforce of the future. Student involvement in research, EBP, and QI projects in the context of the workplace exposes them to many of the research-associated roles of nurses that they might not experience as part of their baccalaureate education. For example, the clinical trials research nurse, a relatively new and evolving role that has recently been proposed as a specialty in nursing, plays a key role in translational research (Hastings et al., 2012). The program described here introduces nurses to that very important link between the bench and the bedside. Nursing students exposed to enhanced research experiences within the academic environment consistently report increased interest in research activities. Early exposure to many of the research-related nursing roles through an immersive, experiential format encourages new graduates to incorporate research into their future plans and to pursue advanced education earlier in their careers. This will lead not only to increases the numbers of nurses with useful research skills but will also lengthen the time that trained individuals contribute to nursing science. Together, these will help address predicted shortfalls in the workforce and reduce the documented faculty shortages.

The structure of this program, which requires interdisciplinary interactions between novice nurses, health care professionals, and colleagues within the basic sciences, helps break down some of the “silos” that often exist in the education of health care professionals. Student nurses function as team members within a large scientific community, developing translational research approaches critical to improved health care and health. Going forward, the program design will include the involvement of more direct care staff nurses from the medical center, having stimulated institutional interest in developing these essential competencies within the existing workforce and organization. In the context of expanding the capacity for nursing research in the state, this program has shown signs of enhancing the collaboration between researchers at an academic medical center (DHMC) and those at partner colleges across the statewide NH-INBRE network. For example, research grants from the NH-INBRE program have recently been awarded to nursing researchers at the partner colleges. The reputation of this collaborative program in the state is very positive, with one nursing school even reorganizing its curriculum in order to free up the summer term and enable its students to participate in the program.

The support structure of this individual program necessarily limits it to a statewide level, making it essential for other nursing programs to develop similar opportunities for their students in order to have a greater collective impact. There are several ways that this program could be replicated or adapted by other clinical organizations and colleges. Here, we have developed a hospital-based program in an academic medical center in partnership with undergraduate nursing programs at relatively small private colleges and at state universities; a novel pairing that capitalizes on a combination of NIH resources (INBRE and CTSA programs) not often present at the same institution. Many states and academic institutions, however, do have at least one of these programs. Twenty-four states have an INBRE programs (National Institute of General Medical Sciences (NIGMS), 2016), which

are often led by a large research institution focused primarily on basic science research. Similarly, there are 60 sites across the United States supported by CTSA mechanisms (NIGMS, 2014).

The program described here demonstrates the feasibility and benefits of nursing school and clinical medical center faculty partnering with their basic science colleagues via an INBRE grant, an initiative that has garnered considerable interest at the national level because of its inclusion of nursing research. Similarly, programs like the one described here fit extremely well within the mandate of CTSA-based programs to develop institutional and local infrastructure in the support of clinical and translational research and could be developed using this type of award.

Apart from these support mechanisms, larger academic centers, particularly those connected to graduate nursing programs, have endowments and/or funding to support nursing research and excellence. Many have clinical scholar programs. These resources could be utilized for a program similar to the one described here, as it enhances both student learning and the clinical environment. As noted, the program can also serve as an excellent recruitment tool for the partner clinical site.

Finally, expanding the level of collaboration between various types of medical and academic programs is often viewed positively and can be effective in securing institutional and grant-funded support necessary for initial program development and the identification of dedicated, enthusiastic individuals devoted to nursing research and education. Small pilot or demonstration projects could provide the means for attracting external sources of support, whether through federal agencies or private foundations. With a combination of key resources in hand, a program like the one described here can be successfully implemented and used to create a nursing workforce able to face the challenges of health care in the future.

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**Table 1**

## Learning Objectives for Each of the Nursing Research Roles

Overall objectives	
1	Identify strategies to answer questions in clinical nursing practice.
2	Describe the role(s) of the nurse in the research environment.
Nursing researcher immersion: and application of research, EBP, and QI	
1	Identify the steps of the research process within clinical and translational research experiences
2	Identify ethical and regulatory precepts within the research design for clinical or translational studies
3	Conduct a focused review of the research using library resources
4	Critique and interpret the results of published studies
5	Describe how to ensure collecting and reporting reliable and valid data
6	Participate in data entry
7	Participate in data analysis
8	Prepare an abstract for poster or paper presentation
Clinical trials research nursing	
1	Describe the nursing process for participants in clinical research
2	Differentiate the 3 phases of clinical trials research
3	Describe strategies to identify potential participants in research
4	Describe how a clinical trial is approved managed and implemented
5	Name the tenets and regulatory requirements specific to the protection of human subjects
6	Identify the basic elements of informed consent for research



**Table 2**

## Experiential Components of the ISURF-N Program

<b>Nurse researcher immersion</b>	<b>Population</b>	<b>Setting</b>
Home-based self-management and cognitive training changes lives	Epilepsy	Ambulatory
The relationship between psychosocial challenges and pediatric voiding dysfunction	Pediatrics	Ambulatory
Continuous pulse oximetry and nursing care for epileptic patients: A descriptive study	Epilepsy	Inpatient
Family involvement with infant transport	Intensive Care Nursery	Post Inpatient
Evaluating a primary care interdisciplinary falls clinic	Internal medicine	Ambulatory
Distress in cancer survivors	Oncology	Ambulatory
Application of research, EBP, and QI		
Transitions of care: Improving the hospital discharge process for epilepsy patients	Epilepsy	Inpatient/Ambulatory
Neonatal central line documentation: A QI approach to enhancing nursing practice	Intensive care nursery	Inpatient
Reducing pediatric readmissions	Pediatric	Post inpatient
Reducing pediatric pressure ulcers	Pediatric intensive care unit	Inpatient
Surveillance monitoring w/ continuous pulse oximetry	Pediatrics	Inpatient
Routine evaluation of gastric residuals in very low birthweight infants	Intensive care nursery	Inpatient
Clinical trials research nursing		
Phase (I–IV) recruiting, enrollment, and clinical care	Oncology	Ambulatory