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Acute Care of the Elderly Column

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Engaging nurses in gerontechnology and innovation in acute care for the elderly



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If you could integrate new technology in one aspect of care for your older adult patients, what would it be? Mobility, falls, pressure ulcers, new onset incontinence, and delirium are geriatric care problems frequently addressed by nurses in acute care settings, yet the growth of the older adult population in health care is outpacing innovations that impact and improve geriatric acute care. There is a recognized need for creative change and innovation to improve healthcare delivery to older adults entering the acute care system and transition to post-acute services. Nurses have the knowledge and creativity to develop and co-design innovations to positively impact acute care for the elderly.

Innovations in gerontologic care have focused primarily on facilitating independence, rehabilitation, and aging in place rather than improvements in acute care of older adults. There is clearly a gap between gerontechnology development and the needs of frail hospitalized older adults¹; however, nursing and patient knowledge and creativity present tremendous resources to co-design solutions addressing geriatric syndromes in the hospital setting.

The Age-Friendly Health Systems initiative, spearheaded by a partnership between the John A. Hartford Foundation and the Institute for Healthcare Improvement (IHI), is a driving force for innovating care system improvements to optimize attention to geriatric care essentials.²

In this article, we highlight selected nurse-led innovations as exemplars aimed at improving acute care for older adults and discuss

ways that academic and practice institutions can facilitate nursing innovations in geriatric acute care.

Innovation is the process of translating an idea or invention into a product or service that creates value.³ The American Nurses Association (ANA) further defines innovation as putting “new ideas into practice or existing ideas into practice in new ways.”^[3] To be clear, innovation can be new processes (think, systems engineering) or designs of care that create value rather than new devices.

Gerontechnology (aka, gerotechnology), a multidisciplinary specialty area of research and application to solve problems of aging in society through the science of aging, engineering, technology and technology diffusion, has emerged as both a new area of science and research as well as a commercial and entrepreneurial growth area.^{4,5}

A recent article by Noublanche and colleagues¹ describes a “hospital-based geriatric living lab” in France dedicated to improving care for frail hospitalized older adults. The hospital-based geriatric living lab (ALLEGRO) uses the principles of co-design in which end users (i.e., frail hospitalized older adults, nurses and other health care providers) collaborate with developers by communicating needs and providing feedback and testing during design and various stages of development of an innovation. Goals of the project are to: (a) connect hospital users and gerontechnology developers in order to facilitate exchanges about needs and technological possibilities; and (b) provide “a place of care in which to test, with actual older inpatients, the feasibility, acceptability, efficiency, reliability, reproducibility and safety of devices under development.”¹ (pp. 17–18). The ALLEGRO lab provides an idea incubator workshop for the exchange of needs and ideas between end-users and developers and an experimental

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hospital room located in the geriatric acute care unit for testing innovations. The unit is equipped to monitor vital signs and to track all movements and falls. This is an exciting model for facilitating patient-centered, acute care gerontechnological innovation. Geriatric acute care specialty units are excellent “living labs” for innovation development and testing.

Success stories from the Nurses Improving Care of Healthsystem Elders (NICHE) program illustrate innovations in care for hospitalized elders. As examples, the Lehigh Valley Health Network Telewound program is an innovative protocol to decrease pressure ulcers and the St Joseph’s Healthcare System activity kit is a toolbox of creative items (word games, coloring book, baby doll, etc.) used with hospitalized patients with dementia to distract and prevent disruptive behaviors.⁶

One nurse recently leveraged technology to impact patient outcomes in transition from acute care to home or other post-acute care settings and is an excellent example of gerontological nursing research translated into a clinical innovation. The Discharge Referral Expert System for Care Transitions (DIRECT) algorithm developed and tested by Dr. Kathryn Bowles and colleagues at the University of Pennsylvania provides clinicians in post-acute care with options for individual patients.⁷ Earlier work by the Bowles team developed and tested the Discharge Decision Support System (D2S2), an algorithm that identified six statistically significant factors associated with likelihood for post-acute care referral of older adults.⁸ The D2S2 was commercialized, sold to a major healthcare company, and is translated into practice in many hospitals across the country. The aim of these gerontological nurse informatics innovations is to improve acute care discharge decisions and, ultimately, the post-acute care of frail older adults.

Another model of gerontechnology innovation is the evaluation and/or adaptation of existing technologies for use with older adults. For example, Nilsen and colleagues⁹ evaluated the usability and acceptability of three commercially available patient communication boards and three patient communication electronic tablet applications (apps) designed for use in the medical setting. Thirty older adults, half of whom had received surgery for head and neck cancer, used the tools – without any prior training – to communicate a test series of messages about common needs and symptoms. Participants completed a modified technology acceptance questionnaire and selected the tool that they felt was most useful and easy to use. Although task performance was significantly better using communication boards compared to electronic communication apps, participants felt that they could use

the electronic apps effectively if given more time and training. These results suggest a need for the development of evidence-based training, cueing and guidance to accommodate older adults in the use of electronic communication aids. Others have rightly called on health care app developers to employ participatory design strategies in the development of apps for vulnerable populations.¹⁰

What opportunities exist for nurses specializing in acute-critical care and gerontological nursing to create, test or adapt gerontechnology innovations?

First, nurses can and should lead participatory design and testing of technologies for and with older adults. Across the country, academic and practice institutions are sponsoring innovation initiatives such as hack-a-thons, competitions, and workshops. The Ohio State University College of Nursing, through a generous alumni donation, has constructed and funded a movable makerspace, the Innovation Studio (Fig. 1). Makerspaces such as the Innovation Studio provide opportunity for prototyping solutions to everyday problems in acute and critical care settings such as devices that camouflage or better secure tubes, more tolerable, reliable and effective mobility sensors, or the adaptation of tools used in non-hospital settings or by other age groups.¹

The Innovation Studio is staffed with experts in prototyping, and is filled with the tools and materials needed to turn ideas into actions. Based on the belief that gathering students, clinicians, and faculty with knowledge and skills across the university community will spur new ideas, the Innovation Studio makes five tour stops throughout the year, setting up shop at different high-traffic locations across campus, like the lobbies of the James Comprehensive Cancer Center, the College of Nursing, and the College of Engineering. Staying at each tour stop for seven weeks, the Innovation Studio engages with a variety of professionals who have a desire to improve health and well-being. Together, nurses collaborate with designers, engineers, and other healthcare professionals to test new ideas and build prototypes that impact the lives of the patients they serve.

At the end of each tour stop, the Innovation Studio holds a ‘Pitch Day’ for interprofessional teams to pitch their ideas to a panel of judges. Entry submissions to the Innovation Studio have ranged from a set of psychotherapy tools to new surgical instrument designs. This ‘Pitch Day’ provides a key structure for innovation that has impacted the success of this program. By hosting the Innovation Studio in healthcare locations like the lobby of the hospitals, the organization sends a clear message to nurses and clinicians that engaging in innovation behavior is encouraged (permission) and that the organization is willing to invest in their employees’ ideas (validation). Providing this permission and validation is essential to obtaining buy-in from nurses. Second, the Innovation Studio takes a unique stance when providing funding and resources to teams who pitch their ideas. *Every first-time team* is guaranteed funding if they share their innovation on pitch day. After receiving their first round of funding, teams are encouraged to complete agreed upon milestones to advance their innovation, and return to the next ‘Pitch Day’ to request their next round of funding/support. This increases the organization’s ideation rate, one of the key indicators to increase the return on investment for innovation.¹¹ Innovations developed within the Innovation Studio are currently protected under university intellectual property policy, and will be shared with the public when permissible.

Throughout the year, the Innovation Studio also provides professional development opportunities to clinicians through workshops designed to further build their innovation and entrepreneurial skillset. In the fall, Innovation Studio teams build their elevator pitch skills by pitching their innovations during the Poster Speed Dating session at the annual Healthcare Innovation and Entrepreneurship Workshop. Each team delivers their 3-minute pitch eight to 10 times, to eight to 10 different audiences, affording presenters the unique opportunity to refine and master their pitch in real-time. At the annual Interprofessional Innovation Symposium in the spring, teams are invited to attend a design thinking workshop that focuses on



Fig. 1. The innovation studio, The Ohio State University College of Nursing.

solving a real-world healthcare problem with diverse members from the healthcare ecosystem. This immersive experience is capped by a fireside chat with leaders from a flourishing healthcare company that have both clinical and non-clinical backgrounds. This combination of skills showcases the power of interprofessional collaboration in healthcare innovation and encourages teams to seek the expertise of others on their own projects.

In assessing the good work and great products emerging from the Innovation Studio, we realized that gerontechnology, particularly innovations focused on the acute-critical care of frail older adults, is not well represented. We are currently planning a special initiative to inspire gerontechnology innovations and invite others to do the same.

What if your organization doesn't have an innovation studio?

Getting started is always the hardest part, but it's the most critical to finding success. If you don't have a formal innovation platform at your organization, start with assessing whatever resources may be available in your organization. Then get started! Use the limited resources that you have, ask for help, and share your story along the way. Once you reach a point where you can breathe, consider building an innovation platform for your organization by following a similar process: assess what resources are available, determine your organizational needs, and start building and iterate as you grow.

If you need more inspiration, there are several excellent national resources, learning opportunities, and events for nurse innovators to help you along your journey:

- The ANA website provides a list of resources to assist nurses in their efforts to facilitate innovate improvements in healthcare delivery although these are not necessarily focused on care of the older adult.¹²
- Johnson and Johnson's new nurse innovation platform provides three programs aimed at enabling and elevating the "visibility and impact of nurse-led innovation in transforming human health."¹³ The program components include: (1) a nurse innovation fellowship, (2) a quickfire innovation challenge, and (3) an innovation bootcamp podcast series.¹³
- The National Hartford Center for Gerontological Nursing Excellence (NCGNE) offers the Claudia J. Beverly Award to "recognize and celebrate innovative programs and projects that highlight excellence in gerontological nursing." Members or teams of NHCNE members are eligible to apply by showcasing

"innovations designed and implemented that positively impact the nursing care of older adults."¹⁴

- The Gerontological Society of America has a Technology and Aging research interest group for members that examines the application of technological advances to improve the lifestyles of the growing number of older persons world-wide.¹⁵

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