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Realizing nurse-led innovation

By Joyce Sensmeier, MS, RN-BC, FHIMSS, FAAN

Our healthcare system is experiencing a digital revolution. With the foundation of electronic health records in place, healthcare systems are embracing technologic advancements to help realize the benefits of digital health. According to the Healthcare Information and Management Systems Society, “Digital health connects and empowers people and populations to manage health and wellness, augmented by accessible and supportive provider teams working within flexible, integrated, interoperable, and digitally enabled care environments that strategically leverage digital tools, technologies, and services to transform care delivery.”¹ A digital health ecosystem requires nurses to be innovators who build new products and capabilities to solve critical problems.² Because nursing is a knowledge-intensive profession, nurses have a deep understanding of clinical needs and can identify and communicate ideas and opportunities for improvement. Nurses can also detect potential areas for eliminating waste, improving efficiency, and optimizing workflow. To achieve a digitally enabled care environment, organizational decision-makers should encourage and enable nurses to bring innovative ideas to fruition.

Education and collaboration

Viewing oneself as an innovator doesn’t come naturally to most nurses. To be successful, it can be helpful for nurses to have a mentor or advisor to guide them along the innovation path. A mentor

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can also help provide the support nurses need to feel comfortable in failing, which is a natural part of the process. Working with an experienced innovator will also help nurses understand that it often takes multiple attempts to get to the desired result.

Nurses can use their social network to gather feedback to refine ideas, bringing forward alternate views and perspectives. Innovation is a team sport made easier by shared participation.³ The innovation path is never straightforward—stops, starts, and reworks are a natural part of the process. When nurses gather feedback from within and outside of their network, possibilities may unfold that they hadn't otherwise considered. (For a look

caregiver and patient needs during the pandemic. There's an increasing use of technology in everyday practice, and nurses are well positioned to take part in these advances. Nurses can also take courses outside of the nursing curriculum in technology design or business to expand their knowledge of the underpinnings of innovation.² Graduate nursing programs focused on nursing innovation are emerging that can supplement nurses' knowledge and skills in developing and launching new ventures.

Although not every nurse is destined for the innovation path, newly designed educational curricula focused on inspiring innovation skills and design thinking may change that mindset.⁷ Emory Healthcare and the Nell Hodgson

vation at the University of Alabama at Birmingham School of Nursing. According to Associate Dean for Technology and Innovation Dr. Jacqueline Moss, "The technology in our building allows faculty to bring clinical and didactic material to life for students, which allows them to gain hands-on experience with the technology they'll encounter in the field."⁹ They've also established video-graphers and instructional designer positions to encourage and support faculty in modeling creativity and design thinking. Through this effort, faculty members are encouraged to collaborate and innovate to produce interactive learning experiences for students.



New generations of nurses are entering the workforce more comfortable with technology-driven innovation and embracing a creative spirit.

at an innovative start-up experience, see *Innovation in action*.)

The global COVID-19 pandemic has inspired an acceleration of innovation. A new awareness of the need for innovation has been thrust upon the world.⁵ The increasing demand for timely data and the need to understand the data to make real-time decisions have more rapidly moved ideas from concept into product.⁶ Dashboard technology, interoperability tools, and forecasting capabilities are among the many innovations being implemented to support

Woodruff School of Nursing have launched a center of innovation, which is a state-of-the-art space that serves as a centralized virtual and in-person learning hub.⁸ The Emory Nursing Experience invites practicing nurses to explore the center and learn to think outside the box. This collaborative effort is focused on giving students and practicing nurses cutting-edge opportunities to hone their skills for the patient care challenges of the future.

Another program to advance innovation is hosted by the Office of Technology and Inno-

Design thinking

Reimagining existing systems and processes requires a new way of thinking. Penn Nursing Director of Innovation Marion Leary, MPH, MSN, RN, is leading an effort to develop a free online course that teaches nurses a new methodology for redesigning the complex challenges they see in their practice.¹⁰ The Design Thinking in Action framework outlines a process that consists of the following steps:

- empathize—try to view a situation from a different perspective

Innovation in action

By Bianca Gonzalez, PhD, MBA, RN, FNP-BC

After practicing as a nurse and NP for 8 years in several surgical and outpatient specialties, I became the vice president of operations for a venture-backed home care technology start-up in Silicon Valley. In that role, I learned so much about finance, sales, and technology development from my clinical and start-up operator experience. Later, I founded a company that manufactures smart-camera systems to track hospital inventory.⁴ The company was first envisioned during my MBA program while collaborating with classmates who were healthcare providers and engineers. The problem of inventory management in healthcare is pervasive and costs hospitals millions of dollars a year. Our company builds technology to solve this problem for ourselves as providers and, ultimately, to help our patients. During our start-up journey, I served as the CEO and in that role, I wore many hats. I was heavily involved in all aspects of the business from sales and operations to technology development. In any start-up, you need a team that both builds the product and sells the product. My cofounders were the engineers who built the product and the healthcare providers who led sales and pursued partnerships.

However, we always rely on our customers to drive product development. We pivoted the technology a few times due to customer feedback and decided to build our current inventory smart-camera system after interviewing hundreds of nurses and supply chain staff. We saw an enormous need to passively count inventory so staff members didn't have to hand count supplies in hospitals. Having a means for automatically counting inventory daily without using staff would help ensure that providers had the tools and supplies they needed to take care of patients. We built a smart camera that can count the number of inventory items on shelves using image recognition deep learning frameworks and models. To build the software, camera hardware, and artificial intelligence components, I teamed

up with hardware and software engineers. My background in nursing and computer science enabled me to build many of the components myself, thus helping the team accelerate technology development.

Because of our interdisciplinary collaboration, as well as the skill sets I possess as a nurse, we were able to pilot our technology in a few clinics, saving thousands of dollars per year in each clinic and eliminating inventory waste and the need to hand count inventory. We received venture capital funding from three sources in the form of equity financing through convertible notes.

Last year, we were very fortunate to win the 2020 Healthcare Information Management and Systems Society (HIMSS)/American Nurses Association (ANA) NursePitch competition and we received a generous grant for our technology. I enjoyed participating in NursePitch because it helped me network with other nurses interested in entrepreneurship and others exploring new technology for their hospital system. Since then, our company has expanded to explore other sectors where our smart cameras could be of use, such as retail warehousing, pharmacies, and dental clinics. For example, our smart cameras can be used to count inventory in pharmacies and warehousing, or any environment where there's inventory tracking.

I encourage all nurses who are interested in technology entrepreneurship to participate in innovation teams in their own clinical practice or consider working at a technology company. Before launching our company, I worked at several technology start-ups as an operator and software engineer. Nurses can learn so much working in an interdisciplinary technology team, including how technology is developed for production. Additionally, being active in the HIMSS nursing informatics community and the ANA through their pitches and hackathons is a great way to meet other nurses interested in technology and entrepreneurship.

- define—analyze and document information that describes the problem
- ideate—brainstorm the idea and consider multiple solutions to address the problem
- prototype—create a prototype and build it using everyday components
- test—evaluate the prototype to make sure it works, then make a video or pitch the idea to classmates or a panel of judges.

Working through this iterative process will help nurse innovators more rapidly create solutions

by envisioning the big picture, thinking creatively, and quickly working through options to develop the desired result.

In a recent survey of clinical leaders, 31% of respondents have a designated nurse leader in their organization whose primary responsibility is innovation and more than 81% of respondents suggested that investing in placing nurses as decision-makers on all strategic planning teams will be very important for health organizations by 2025.¹¹ It's critical for health systems looking to

develop patient-centric solutions to engage nurses in the process.² What skills are most valuable for nurses to embody when redesigning systems or creating clinical innovation solutions? According to the survey, the following skills are optimal:

- design thinking for process change (88%)
- interface of clinical innovation and technology (86%)
- excellent clinical acumen (85%)
- data and analytics (77%).

Nurses who possess these skills can serve as strategic

assets for healthcare organizations. And nurses should be encouraged and nurtured to expand these skills to build a workforce that enables an innovative organization equipped for the digital future. (See *Starter guide for nurses*.)

Advancing nurse-led innovation

Promoting a knowledge-sharing culture, investing in technology tools, and building an organizational culture in which nurses feel comfortable thinking creatively are essential to advancing nurse-led innovation.¹³ Nurse leaders should seek and encourage innovators and structure an environment where innovation is expected and rewarded. Develop an organizational culture that encourages creativity, agility, and flexibility, and facilitate sharing experiences and storytelling when tackling innovative problem solving.¹⁴ One key to engag-

ing nurses is to allow time for innovative thinking that doesn't seem like work.

To strengthen nursing's role in building a culture of health and advancing innovation, the Future of Nursing: Campaign for Action, AARP, and the Robert Wood Johnson Foundation recently selected 10 projects proposed by state-based action coalitions to receive awards up to \$25,000 for new or ongoing work. According to the Campaign for Action, the Nursing Innovations Fund was "created to support the work of its action coalitions to inform and influence policy, produce replicable strategies that place nurses in positions as essential partners in providing care, and strategically involve a diversity of stakeholders."¹⁵ This program will go far toward incentivizing nurse-led innovation that serves to transform healthcare.

Empowering nurse-led innovation is essential for realizing a digitally enabled care environment that makes the best use of technologic advances. New generations of nurses are entering the workforce more comfortable with technology-driven innovation and embracing a creative spirit.⁷ Encouraging creativity by giving nurses a seat at the decision-making table and building opportunities for exploring ideas will serve to accelerate nurse-led innovation.

Envisioning the future

Today's healthcare environment is increasingly fast-paced and dynamic. Nurses must be prepared to inspire, innovate, and lead healthcare transformation.¹⁶ Whether aiming to adapt behavior, improve efficiency, or develop new business models, the goals of health innovation are to improve healthcare and health outcomes.⁵ By enabling nurse-led innovation, we'll more rapidly embrace technologic advancements to realize the ultimate benefits of a digital health ecosystem. **NMI**

Starter guide for nurses

If you have staff members interested in beginning on the innovation path, you can share the following ideas with them to get started:

- Take a few courses in computer science or design thinking to help lay the foundation for growth and provide the opportunity to learn new skills.
- Reach out to peers, interprofessional colleagues, mentors, or advisors who have experience with innovating to help identify knowledge gaps and fine-tune your preparation. Finding a champion in your organization or gaining support from organizational decision-makers is essential for getting the staff and resources for your project.¹¹
- Refine your idea into a viable solution by determining if it has value and is worth pursuing. Research whether there's a solution already in the marketplace that meets the same need and determine if the idea is truly actionable and whether manufacturing and production are feasible. Will you be able to secure funding and is there good marketing potential? This is a critical phase for determining whether your idea can be a viable product by meeting a need in today's marketplace.
- Develop an "elevator pitch"—a short speech that can be completed in the time it takes to ride an elevator or about 60 seconds—to present a concise case for your idea.¹² Honing the essential points down to this amount of time can be difficult but if you don't, you could risk losing your audience. It's also helpful to get to know relevant stakeholders by attending conferences or events they're likely to attend. Becoming comfortable in a business environment and learning the language will help you feel more like a member of the innovation team rather than an outsider looking in.

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