Canadian researchers at the University of Waterloo recently reported results of their large-sample study of whether and how the language about patients’ health used by nurses in nursing notes correlates with actual patient mortality and survival (Waudby-Smith, Tran, Dubin, & Lee, 2018). Based on unstructured notes extracted from 27,000 patient records in a public intensive care unit database, researchers used a “sentiment analysis algorithm” and regression modeling to assess the words nurses used and patient mortality and survival.

The team determined there was a significant correlation between the adjectives used by critical care nurses in describing a patient’s health status and 30-day mortality post discharge; a positive correlation (although more limited) also existed between nurse-note adjectives and survival. The researchers suggested that unstructured clinical notes authored by hospital nursing staff can serve as indicators of clinical outcomes and should be further studied and incorporated in clinical outcomes prediction models.

As leaders, our initial response to this report was admittedly along the lines of “well, of course that makes sense;” many nurses would not be at all surprised by these findings. Present with critically ill patients around the clock and prepared with expert assessment skills, nurses are finely in tune with the most subtle nuances in patient response to illness and various treatment efforts.

It didn’t take long for our entrepreneurial predisposition to kick in. Rather than simply discussing this study with colleagues, what if we could use our expertise in nursing assessment, intervention and outcome classification, informatics, and process design to develop a means to search records in real time for predictive signals, and then develop protocols to initiate treatments to reverse indications of a dangerous physiological decline? And what if we could raise capital through a venture capital (VC) company to fund our development efforts and eventually commercialize the processes, technology, and product? This path would allow others to benefit from the innovation while enabling the funding company to make a financial return.

The Rise of Entrepreneurial Healthcare Venture Funds

Increasingly, healthcare systems are developing investment arms to do just this – create and commercialize solutions to intractable problems identified by the clinicians closest to the patients. In addition to innovating devices or practices themselves, these venture groups may provide capital to other companies (often startups) in exchange for partial ownership of the company or the product(s) developed. Examples of venture arms of large health systems include: Ascension Ventures, Mayo Clinic Ventures, Partners Innovation Fund, Kaiser Permanente.
Ventures, Cleveland Clinic Innovations, and UPMC Enterprises.

These organizations, which typically are for-profit arms of not-for-profit healthcare systems, conduct the business of a VC firm (see Figure 1). Their goal is choosing wise investments, whether through leveraging the intellectual capital of clinicians and scientists within the health system to bring ideas to market, locating startups that need seed capital, or identifying interesting mature companies that need a second round of investment or help in going public.

In fact, numerous health system-related venture companies manage hundreds of millions of dollars and make a wide spectrum of investments (e.g., imaging technology, biopharmaceuticals, business practices, software, and devices). System-affiliated venture organizations often have a specific stated mission that guides their investment strategy. For example, in addition to achieving financial goals, investments must align with the mission and values of the system. Such is the case with Ascension Ventures which states the companies in their portfolio must support the missions of their limited partner base of 13 health systems to “provide care to the poor and vulnerable.”

**Why Should the Missions and Mechanics of Investment Strategy Matter to Nurses?**

Increasingly the innovation and investment arms of health systems are looking to nurses for their expertise and understanding of patients, other clinicians, and communities. These attributes enable nurses to identify opportunities and solve problems creatively, as well as discern which innovations are likely to succeed.

Michael Dowling (2018), president and CEO of Northwell Health, New York State’s largest healthcare provider and private employer, cites the importance of nurses in participating in this type of strategic direction for health systems. He notes, “Nurses have an unbelievably detailed expertise in the day-to-day operations of clinical delivery. They have extensive clinical knowledge and their bedside experience gives them an intricate understanding of diseases and their diagnoses. Providers will always respect a leader who can bring clinical proficiency to their position, and nurses have no shortage of that knowledge” (para 3). He further observes, “Perhaps because of the ever-changing environment in which they work, I find nurses to be more open to change than other clinicians. Nurses are always looking for ways to make care more effective and efficient on a day-to-day basis” (para 9).

Relatedly, Thew (2018) encourages healthcare executives, who are eager to find solutions for business challenges, not to overlook in the problem-solving quest a most valued resource – nurses. She reported that organizations increasingly are fostering nurse-led bedside innovation with remarkable results, including...
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evidence-based improvement in processes, products, and big data analyses to drive value-based care models. Increasingly nurses are becoming involved in innovating, inventing, and advising health systems about their strategic venture arms. At Nicklaus Children’s Hospital in Miami, FL, nurses are playing an important role in the invention and commercialization of products that offer innovative approaches to improving the lives of children worldwide.

Children’s Health Ventures: Case Study in Innovation

Created in 2012, Children’s Health Ventures, Inc. (CHV) is a for-profit entity of not-for-profit Nicklaus Children’s Health System (NCHS), and a main driver of the system’s comprehensive innovation strategy. CHV’s goal is to advance innovative healthcare products and services through both internal development and investment partnership in early-stage startups and technologies that will bring improvements to pediatrics and the wider healthcare industry.

NCHS’s mission, vision, and priorities guide the measurable objectives and strategy of the CHV investment program. NCHS strongly supports the approach to venture investing and startup incubation. As a result of this cultural acceptance, unique opportunities have emerged, including:

- Ability to secure financial resources to invest in great people and ideas.
- A unique position to drive value for selected investments.
- Access to world-class experts who are in tune with market needs and trends.
- An ideal incubator and accelerator for ideas, products, and technologies.

CHV differentiates itself from many other venture funds by providing access to a Living Laboratory – a health system with an over 300-bed pediatric hospital, research institute, and network of outpatient centers across South Florida. The venture arm recognized early on, that while startups are capable of building solutions outside hospital walls, those solutions may require considerable change once brought into the framework of hospital operations. Startup entrepreneurs can benefit from gaining an understanding of the complexities navigated by end-users of their solutions in the hospital. Access to workflows and clinical guidance during both development and testing stages can significantly increase acceptance and adoption of a startup solution by the host system and other health systems.

Many important players participate in the venture ecosystem established within NCHS, setting CHV up for success by assessing opportunities and de-risking investment selections throughout the investment life cycle. EntrepreNurses are one important group in this de-risking process. These nurse champions can evaluate and critique technologies at a programmatic scale based on their experience with workflows and engagement with other clinicians, patients, and families.

More than likely, a startup’s solution to a challenge in health care, especially one that aims to have an impact on prevention, access, treatment, and patient monitoring, has been identified already as an opportunity by a nurse. It is likely the nurse previously either found a work-around to or fixed the problem without realizing the value of scaling his or her solution. Therefore, when the startup pitches its solution to CHV, who better to evaluate that solution than a front-line nurse in the department targeted by that solution?

The first interaction with an EntrepreNurse takes place at this point in the Living Laboratory at NCHS. Then, CHV staff members leverage that nurse’s feedback, questions, and guidance, and learn quickly whether or not a startup has the potential impact required for investment.

Once an investment has been made in a startup, CHV deploys time and resources to nurture and support those startups, including support from EntrepreNurses. At NCHS, the belief is that “better is always possible.” Nurses think creatively about how to innovate efficiently, effectively, and empathetically, and provide outstanding mentorship for the startups and facilitation for solution incubations within the hospital. “Test, fail fast, and pivot” is the motto. The EntrepreNurse is the ideal product tester to advise startups of any changes that should be made to their solutions before they become too costly and detrimental to both CHV and the startup itself.
Example: Crash Cart Management

One of the many challenges faced by hospital staff in delivering quality care while managing costs is the effective management of assets. The location monitoring of important assets, such as medication and emergency equipment supplied crash carts, in real time and over time enables hospital staff to tackle safety problems and increase efficiency, thereby reducing costs while improving patient outcomes.

Several years ago, startup NESA Solutions presented CHV with an opportunity to invest in a solution for “financial waste experienced by the mismanagement of a hospital asset.” NESA proposed building a module that would automate crash cart inventory, providing both crash cart locations and supplies-expiration information.

Using the CHV process, EntrepreNurses assessed NESA Solutions’ pitch, enabling CHV staff to identify and appreciate the value of automating crash cart management. Historically, such management at NCHS required two nurses to check the status of crash cart, specifically checking for expiring medications and supplies in weight-specific drawers. To accomplish these checks, nurses were pulled away from patient care responsibilities for more than 350 minutes each month. The opportunity to automate and decrease this nurse time away from patient care was worth CHV’s consideration.

CHV approved a pilot with NESA Solutions. Two EntrepreNurses were included as part of the NCHS team to support and co-develop the pilot solution. Through their efforts, the crash cart design and automation process were successfully optimized with the end-user nurse in mind. In less than a year, the pilot resulted in an 89% reduction of nurse time away from patient care and a cost savings of $285,000.

Moving forward with even closer ties and expanded roles for NCHS nurses in investment strategy, CHV expects its investment evaluation and development processes to become even more exact, rapid, and valuable to investment startups that are incubated within the Living Laboratory. Venture investing is a journey for both investors and startups. With the support of EntrepreNurses, CHV has a competitive advantage with the investment-vetting and development process that is pivotal for its growing reputation and impact on health care.

Nurse Executive Call to Action

Based on their commitment to improving patient outcomes and their extensive bedside experience, nurses often are the best of creative problem-solvers for patients and their families. Innovation and entrepreneurship opportunities arise during unique moments of problem identification by nurses working with patients. The nurse executive has a distinctive role in developing and supporting a culture that brings such moments to the forefront in search of innovative ways to create solutions in care provision.

A number of approaches can be used to enhance nurse-identified solution opportunities, including interprofessional councils that support innovation, and nursing research or evidence-based practice councils that foster new ideas and approaches, while testing them. For example, using the American Nurses Credentialing Center Magnet® model component of New Knowledge, Innovations, & Improvements (2019), such a council can encourage and recognize new innovations/practices that improve care. But wherever the innovation function resides, its presence among the nursing shared leadership council model needs to be palpable to promulgate future ideas.

The nurse executive plays a critical role in providing support for these efforts, whether financial, time, or other type of resources, including support through philanthropy, grants, or awards. To spark creativity, the nurse executive must help nurses recognize their value proposition with innovation and engage them in developing, communicating, and disseminating successful innovations. Innovation successes and failures can be shared with nurses for valuable insight. This process paves an informed and expert pathway toward innovation-enhanced, improved care for patients as provided by fully committed staff with pride in their institutions’ investment in success. $
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