

WILDCAT NURSING NEWS

The University of Arizona College of Nursing

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Joan L. Shaver Professor and Dean

Health and Technology Intersect

A s the College of Nursing's 60th Anniversary year came to a close, it was an ideal time to reflect on our 2017 achievements. Our faculty have been inducted into the American Association of Nurse Practitioners and recognized by the American Academy of Nursing. Our innovative

Integrative Nursing Fellowship has expanded to include participants from eight institutions nationwide. And we've continued to emphasize our three distinguishing

focal areas: cancer prevention and survivorship, integrative health and this newsletter's spotlight, health informatics, systems and technology. In these pages, you'll read about our new telehealth training for students, our work to tailor the electronic health record to best support the needs of nurses, and our faculty's forays into the business world with an invention that prevent the health-related downsides of immobility and a start-up early detection alert system that will vastly improve patient outcomes.

From the Bench to the Bedside

Dr. Jane Carrington, one of the College's foremost nursing informatics experts, will soon be one of the first faculty members to bring a medical product to the commercial market.

On the heels of a \$745,417 ROI grant from National Institute of Health (NIH) and the National Institute of Biomedical Imaging and Bioengineering (NIBIB) for her Electronic Health Record (EHR) algorithm to alert nurses to important clinical events, she was invited to participate in the 2017 Coulter College Commercializing Innovation (C3i) program. C3i helps inventors in the academic world usher their discoveries on to commercialization by uniting inventors with business advisors, consultants and marketers. In a moment straight out of Shark Tank, after she presented her pitch, two venture capitalists offered her \$3 million in seed money in exchange for 10% of her invention

Tell us about your project. CECAMS (Clinical Event Communication Management System) is an early detection system for changes in status of fever, pain, bleeding, urine output, breathing and consciousness.

What's special about your approach? Our project

follows the rules of computer science for algorithm and machine learning. We're using innovative data visualization strategies to develop a prototype EHR.

Describe the C3i program? C3i is committed to helping people like me commercialize their inventions. It involves weekly assignments, web presentations and coaching exercises with venture capitalists.

What is particularly unique about this work? I look at the EHR as a communications system rather than as a documentation system. I adhere to what is known about human factors for the user technology interface and I put all that together for messaging, receiving the message and then determining where that data goes after the message has been received. We're working on understanding how nurses use the EHR so we can redesign it to be a useful communication system.

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Bed-Sled Eases Health-Related Downsides of Immobility

Long periods of immobility have ravaging effects on your body," says University of Arizona College of Nursing Clinical Associate Professor Dr. Laura McRee. People who have mobility limitations are prone to an array of adverse reactions, including rapid reduction of muscle mass and bone density that decreases a patient's muscle strength over time. One consequence can be deep vein thrombosis (DVT), which creates a risk of pulmonary embolism, a condition that is responsible for 60,000-100,000 deaths in the United States each year.

McRee, who has focused the bulk of her research on preventing such conditions, may hold the keys to a better way with her new invention, the Bed-Sled. The innovative resistance training device promotes movement for a patient's lower legs using a spring-loaded footpad to create resistance, thereby preventing muscle de-conditioning and the

formation of blood clots. Equipped with a sensor to record the amount of pressure applied and the number of depressions of the footpad, the Bed-Sled tracks the progress of a patient's lower extremity strength.

Designed to be both portable and affordable, McRee's device currently exists in a small-scale prototype format, but plans are underway with the help of Tech Launch Arizona and their National Science Foundation Innovation Corps (NSF I-Corps) Site Program



to create a full-size version that can undergo clinical testing.

McRee's invention could ultimately save billions of dollars through use in hospitals for physical therapy, but the average consumer stands to benefit as well. Thanks to her participation in the current NSF I-Corps cohort, she is gaining the expertise to expand commercial possibilities for the Bed-Sled and to target a broader base of customers. "Bed-Sled has the potential to appeal to a global market," says McRee, pointing out that accessibility and ease of use can benefit anybody in an immobile state, young or old. "Sometimes, it doesn't have to be a complex change that makes a profound difference to prevent adverse consequences and promote health."





A Mobile App Enhances Prospective Memory

Taking one's medications as they were prescribed is essential to managing disease but sometimes a challenge in adults undergoing age-related or other kinds of memory changes. Dr. Kathie Insel is striving to assure that older adults are helped to take their medications as prescribed. Having learned that other memory functions called executive function and working memory also affect remembering to take medications, in prior work, Dr. Insel tested a conventional behavioral intervention designed to support prospective memory. She and her team are now developing a mobile app that could have wide reaching implications for helping older adults in general and others who experience certain brain changes as a consequence of illness and/or treatment.

Dr. Insel Dr. Insel and her colleagues are designing and executing an app for smartphones that translates the essence of her behavioral intervention into consistent daily reminder support. The overall intent is to make self-management of chronic conditions easier and more successful, thus promoting continued independent living for as long as possible among older adults.

"Study after study has demonstrated differences between younger and older people and the way they process information and remember" says Dr. Insel, pointing to the two types of memory, retrospective memory (remembering something you did) and prospective memory (remembering to do something you intend to do). "To date, little attention has been focused on translating what is known about prospective memory into specific supportive strategies that can be put in the hands of patients and therefore enhance older adults' capacity for self-management."

Now, thanks to a \$275,000 National Institute of Health (NIH) R21 research grant, Dr. Insel and her colleagues will transform the behavioral intervention to a smartphone application (app) and test its influence on medication-taking by patients grappling with high blood pressure. "People think older adults don't use smartphones, but there's a generational change going on whereby older adults are more tech savvy that ever before. Furthermore, we are seeing that people are looking for apps to help with remembering to take medications. So there's definitely a need."

\$3.4 Million in Endowment Gifts Support Research, Education and Faculty

This year the College of Nursing was honored through the support of three generous endowment gifts that will help us continue to have a quality impact on the nursing workforce for generations to come:

\$2.35 million

A gift to establish the **John and Nell Mitchell Endowed Chair in Pediatric Nursing** for recruiting and retaining nationally recognized pediatric nurse scholars.

\$974,000

A gift to establish the **Dr. Beverly McCord Endowed Chair in Nursing** to support the research and education of graduatelevel nursing students focused on older adult care.



\$100,000

A gift to establish the **Catherine Anne Stoner Memorial Scholarship Endowment** to provide scholarships to Arizona residents enrolled in the Bachelor of Science in Nursing program.

To learn more about how you can support the College of Nursing, visit: nursing.arizona.edu/giving

Nursing Informatics Help Nurses Make the Best Decisions for Patient Outcomes

Dr. Sheila Gephart had an epiphany when she realized that unwieldy electronic health records (EHR) systems were impeding the quality of work for nurses on the job. While creating a quality registry for babies born with low birthweight, she discovered that a large amount of patient data was slipping unused through the cracks. If the point of EHRs is to provide quality outcomes for patients, she concluded, then there was clearly room for improvement to support clinical decision-making, especially for nurses. In the Journal of the American Medical Informatics Association (JAMIA) last year, Dr. Gephart reported on her systematic review of the state of clinical decision support (CDS) science for hospital bedside nurses. She concluded that decisions made by bedside nurses improved the processes and effectiveness of care, but the number of nurse decision-making CDS studies lagged behind physician decision-making CDS studies, obscuring the evidence to show positive change in patient outcomes.

Tell us about your CDS study?

When I was in practice, I noticed gaps in how we were making decisions in the neonatal intensive care unit and I wanted to help clinicians by providing them better systematic and convenient information about the context of care and the factors that put a baby at risk to develop complications.



Tell us more about CDS for nurses

CDS matches patient characteristics to best recommended care and delivers reminders, alerts or advisory messages to support nursing care that aligns best with expert recommendations. The best and most effective CDS is built on data that comes directly from the EHR.

What are some of the decisions nurses make that this work would benefit?

Nurses assess how at-risk a patient is for a fall, to develop an adverse complication, or to develop sepsis. They decide how to prevent a patient from getting a complication they shouldn't. One critical decision nurses make is about monitoring and communicating signs of a patient getting worse.

What makes your study particularly unique?

Nurses put more information into the EHR than anybody else in the hospital and their needs are the least well met. In some situations, the EHR has not been designed or adapted to help them do their job easier or more efficiently. With our paper, we showed how little evaluation of nursing CDS is available and how underdeveloped it is to meet nurses' decision-making and ultimately patients' needs.

How will the results of your study impact nursing education?

It brings more visibility to the decisions that nurses make and how they need technology to support them to add value to the EHR for them. Systematic reviews are important to make sense of a body of research and to identify next steps. This helps both PhD and DNP nursing students. They need to be able to take in the whole breadth of what's going on, find the gap, and decide what to do next.



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In Their Own Words



Mosima Choshi PhD Candidate

"For me, nursing is the center and the pillar of health care provision. Through research and teaching, I will make an impact on nursing practice and the nursing profession. Building a better nursing future is not only for nurses, but also for the populations receiving the nursing care."

Share a Wildcat Nursing Memory

Email us at **news@ nursing.arizona. edu** with a fun memory (and a photo if you have one!) from your time at our College. We want to highlight as many of our 7,500 alumni stories and photos on our social media as

we can.



The estate of bestselling integrative health author, educator and cancer survivor, **Jack Challem**, is providing a \$50,000 gift to University of Arizona College of Nursing Assistant Professor **Thaddeus Pace**, **PhD**. With home caregivers as well as patients coping with cancer, Dr. Pace is testing a specific meditation technique called Cognitively Based Compassion Training (CBCT®). It is designed to cultivate compassion thinking that will reduce stress, build resiliency, improve relationships and foster human value in the self and others.

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