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GETTING TECHNICAL

Because advances in technology continue to alter the work landscape in which healthcare travelers find themselves, the ability to learn and adapt is essential.

Jill Sederstrom

It wasn't long ago that nurses jotted notes in paper charts and patients' movements were restricted due to the connective wiring linking them to their monitors.

Today, pen and paper have been replaced by computers, heart monitors are now wireless, and X-ray imaging has converted to digital. These are just a few of the technical progressions in an industry that is continually evolving, and they're just a handful of examples of why today's healthcare professionals must be skilled at staying connected.

Hospitals across the country are embracing technology that strives to improve efficiency, increase safety, and

offer mobility for patients and healthcare providers. As technology continues to evolve, healthcare travelers are expected to evolve as well, requiring traveling nurses, therapists, and technicians to hone their skills and be prepared to handle the latest innovations that could present themselves on the next assignment.

Mobile medicine

Society has become a more mobile world, and hospitals are no exception. Commonly known as mHealth, mobile healthcare technology has been gaining momentum across the country, and researchers continue to search for new and innovative ways to use mobile devices to record health data, assist with real-time monitoring of patient vital signs, and deliver health-related information to a patient's healthcare team.

One of the most prevalent examples of mHealth is the adoption and use of electronic medical records. These electronic records have replaced many paper charts and can be easily accessed by nurses, physicians, radiography technologists, or physical therapists by computer or iPad.

Elizabeth Schneider, RN, MSN, associate dean of allied health for Keiser University in Daytona Beach, Fla., says she believes this has been one of the most significant changes in the field of nursing, and that it has transformed the way nurses track a patient's progress and vital signs.

The advantages to this new form of recordkeeping is that it requires less time of nurses, who are able to enter real-time data into the record while in a patient's room. It provides more accurate data

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and allows multiple healthcare professionals to have access to the same information. Electronic medical records can store digital X-rays, doctor's notes, medication orders, or physical therapy directions all in one place that's easily accessible for the entire healthcare team.

Nurses aren't the only group that has embraced a more mobile workplace. Speech language pathologist Charlene Marcum, MA, CCP-SLP, says she was surprised early on by how frequently she uses her iPad when working with clients.

Marcum, a traveler who is assigned to help elementary students in Delaware, says she uses a variety of applications that are either free or available for a minimal charge while on the job. One of the general applications, Dragon Dictation, allows her to record her clients as they speak and then play it back to them so they can hear how they sound.

Charlene Marcum, MA, CCP-SLP

She says the iPad is more affordable than buying more costly speech therapy computer programs, and it's portable, easy to work with, and more fun for students.

Marcum says she uses the device with her adult clients who are struggling with aphasia, a type of language disorder in which patient cases range from having difficulty remembering words to being completely unable to speak, read, or write. She says the iPad has also improved the accuracy of her notes because she's able to record client scores and observations as she is working with them.

"It ties me to a device more than I was before, but it's made my time more efficient," Marcum says.

Emphasis on safety

In the last five years, the country's healthcare system has come under increased scrutiny regarding better patient safety standards, despite reductions in staffing. As a result, new technology is assisting hospitals in increasing safety and improving efficiency.

Many U.S. hospitals now use computer databases to dispense medications to reduce medication errors and ensure that the medications are given at the appropriate times. These computer-based systems often require nurses to highlight the patient's name, enter a code into the computer, scan the medication, and then scan the patient's armband before they can distribute medications.

"Maybe it's too soon for that pain medication and the computer will say it's not available yet," Schneider says. "Or maybe the computer says … there has been a new order or a change in this medication and do not dispense until checking the new order."

Many heart monitors are also going wireless, giving patients more freedom to move about the hospital without feeling tethered to their beds.

Hospital staff can monitor these patients EKG rhythms at central monitoring stations within the unit. The computer is programmed to monitor the rhythms and alert nurses if they find a concern.

"Humans, I think, are the best in providing care, but having another set of electronic eyes, so to speak, in evaluating rhythms and watching patients' cardiac response to exercise and such is always a good thing," Schneider says. "There is never enough safety when it comes to dealing with people's lives."

More than 1,500 operating rooms, trauma, and labor and delivery suites nationwide have adopted the RF Surgical Detection System to reduce errors after a surgical procedure. The system uses low-radiofrequency to detect surgical items used during the procedure.

Dr. Jeffery Port, an associate professor of cardiothoracic surgery and an associate attending surgeon in the division of thoracic surgery at New York Presbyterian-Weill Cornell Medical Center, says the device is used to prevent sponges or gauze from being left inside a patient.

"It can reduce the need for follow-up x-rays and even time spent trying to rectify a miscount of surgical materials, improving efficiency as well as patient safety," he says.

The device is easy to use and can be used by any member of the surgical team, only requiring a 30-second scan of the body.

There have been technical advances in the field of radiography as well. Kerry J. Stehlik, MS, R.T. (R)(T), program director for the radiography pro-

gram at Sanford Brown College's West Allis campus, says one of the latest advances in the field has been the switch from computerized radiography to digital radiography.

Radiography technologists take an image and put it into a reader that constructs an image that can be viewed on a computer, and the technologists are able to determine whether their positioning was correct. However, in digital radiography, there's only one image receptor connected directly to the computer, decreasing the steps in the process and increasing user-friendliness for radiography technologists.

"After you take the radiograph, that information gets downloaded into their computer and then you can take the next radiograph with the same image receptor," Stehlik says.

Some radiology departments have also started using a picture archiving and communication system (PACS), which provides economical storage and rapid retrieval of X-ray images.

"With the new and improved systems going into the digital arena, what you find is that it makes it a little bit easier for the technologist and a little bit more efficient," Stehlik says.

Both pieces of technology often come with a hefty price tag, so Stehlik says they aren't available in every facility.

Bridging the distance

When patients are within hospital walls, monitoring their health and progress is often simple. But once a patient goes home, that process can become more difficult. To assist in the home healthcare industry, more healthcare professionals are relying on telemonitoring devices to track their patients' conditions.

George Demiris, PhD, professor and director of clinical informatics and patient-centered technologies at the University of Washington's School of Nursing, says he has several studies in progress that examine the effectiveness of telemonitoring devices.

According to Demiris, this type of technology allows patients to capture information on their vital signs, blood pressure, or glucose levels and transmit them to a homecare agency or community nurse using the Internet or telephone.

One advantage of this type of technology is that it allows patients to have access to their own health information, and it may encourage them to be more involved in their healthcare. It can also be a more efficient process for the community nurse.

"In homecare, the technology should not be meant to replace face-to-face interaction, but instead of having people drive out to people's homes to take their blood pressure,

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for example, you can more efficiently or effectively design the services and the care plan to go out to people's homes when there is more need," Demiris says.

When it comes to patient monitoring, there's always room for improvement, it seems.

John Rogers, PhD, a professor of material science and engineering at the University of Illinois Urbana-Champaign, is developing a patch-based device monitor that operates much like a temporary tattoo and can be easily applied directly to a patients' skin. Although the device is still in its development phase, Rogers believes what he calls epidermal electronics can play an important role in patient care, and it reflects the types of technology being adopted in patient-care settings.

John Rogers, PhD

"We think there's a whole host of opportunities, ranging from just physiological status monitoring, wellness monitoring, to therapeutic-type applications where you are not only sensing but you are delivering a therapy, or electrical stimulation," he says.

Capable caregivers

As technology advances, the biggest challenge for healthcare professionals is finding ways to remain proficient.

Dan Vorse, RT, CHT, lead respiratory therapist St. Mary's Hospital and Regional Medical Center in Grand Junction, Colo., says some of the most significant changes in the respiratory therapy field have been the continual changes in ventilators.

With each new generation of ventilator system, there are also new functions and capabilities associated with the machines that must be mastered. Vorse says it's often left to the respiratory therapists to find educational opportunities to familiarize themselves with the latest technology, whether it's through association and trade magazines, webinars, or other educational programs.

"As a respiratory therapist, that's what we get paid for, is to be able to know and understand the different modes the ventilators can perform," he says.

Finding educational opportunities can be especially important for traveling professionals, because it can ultimately impact the duties they are given on an assignment.

"If we get a traveler and after we do orientation if they are not strong in ventilation, they are going to be doing nebs on the floors," Vorse says. "If you want to do what you went to school for, positive pressure ventilation, and make a difference in your 12-hour or 10-hour shift … you have to keep up on this stuff. You have to prove that you know what you are talking about, and then we don't have a problem putting those travelers in those units."

Evolution continues

Education and training will likely be a constant in the life of a healthcare professional, as researchers continue to examine new ways to improve patient care and streamline hospital operations.

Vorse says he tells his staff that if they plan to stay in acute care medicine, they should be prepared for change.

"What you are doing now is not the same thing you are going to be doing six or eight months from now," he says. "I think that's really important. If you are doing acute care medicine, whether it's nursing at the beside, whether it's respiratory at the bedside, it's going to change."

Rogers and his team of engineers at the University of Illinois Urbana-Champaign are already hard at work researching new technology possibilities.

"We're trying to do things that are … building on trends in the conventional consumer electronic world but formatted in packages that are friendly to the body," he says.

Although technology will continue to evolve, Schneider says there are some aspects of healthcare that will never change.

"I don't believe that technology will ever take the place of a human relationship, a hand in the middle of the night, somebody to talk to and somebody to reassure you. You are just not going to get that from a machine," Schneider says. "The machine may help add information to the situation, but it will never overcome the humanness of a healthcare provider."

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