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From the Editor

It’s plain and simple — we are here for you, the nurses who nurture patients during 12-hours shifts, face challenges of learning new technology and processes, and follow best practices to improve patient outcomes. ADVANCE for Nurses wants to give California nurses the resources you need to continue providing the quality care you strive for day after day.

To do this, we offer clinical features, coverage of regional issues and CE opportunities. For instance, this issue highlights the pressing issue of needlestick safety. Is enough being done to reduce the incidence of needlesticks? Find out more by reading "Sticking to the Law."

We also are showcasing California nurse leaders who have decided to make late-stage career changes, realizing the journey in nursing can take you many places. And don’t miss reading about effective methods of treating children with dehydration.

On our website, nurses are able to earn CE credits, participate in free informational webinars, read nursing news from your region, and join the discussions on our blogs and forums. But that’s just a small example of what we offer. To find even more content, go online at www.advanceweb.com/Nurses.

And, if you’re not already connected with us through Facebook, Twitter or LinkedIn, click on “Community” at the top of the page and get involved. You can also sign up for our free biweekly e-newsletter on our website to stay informed.

So wherever and whenever you need information or want to reach out to your colleagues, ADVANCE is there — for you.

Pamela Tarapchak
What do you do after you’ve climbed the highest mountain? For a group of West Coast nurse leaders, the answer was simple: find a higher mountain and scale it.

ADVANCE spoke with two nurses with long tenure as hospital chief nurse executives who changed focus as they entered what could be called the last chapter in their professional careers. While each had different reasons to make a change, both said a desire to make greater contributions to the nursing profession combined with a desire to fulfill a professional passion led to their moves. And, despite that desire, neither moved on without much soul-searching.

New Heights

After 38 years in practice, 14 as CNE at Providence Little Company of Mary (LCOM) Medical Center in Torrance, CA, Kathy Harren, MPH, BA, RN, began to examine where she was in her career. A past president of the Association of California Nurse Leaders, she had always viewed the CNE role as the pinnacle of her nursing career. She worked in an organization she loved and felt her contributions and that of her fellow nurses were valued, but she wondered if there was more she could do.

At the same time, Providence Health began thinking of a way to standardize practice for the 3,600 nurses who worked in its nine Southern California hospitals and rehab centers through a new Providence Southern California Nursing Institute. When Harren heard of the plan for the nursing institute, she had to decide if this was a good time — the right time — to transition to a different role and pass her hospital forward to another nurse leader to continue the work she had been doing for so long.

It was. She applied, went through a rigorous interview and selection process, and was chosen from a group of outstanding candidates to take the helm of the new nursing institute. The new director post aligns well with the skill set Harren has developed throughout her career.

“It was a difficult decision to step out of that work and into this different, yet just as important, innovative work,” she said. Over the past few years, I set up the infrastructure for LCOM to attain Magnet status and now have passed the sacred organization forward to our new CNE, Jessica Rivas, MSN, RN, CENP.

For Harren, that renewal has led to a new energy for a new direction. “I was worried that I wouldn’t be able to draw the dots to making a difference,” she said. “I may not see the results right away here, but I know we will advance the work of professional practice in nursing at Providence, which at the end of the day, means advancing quality and safety. It’s really about transformative work and the opportunity to create something that doesn’t yet exist. My new work will help Providence CNEs do theirs.”

Following Her Heart

One of those CNEs is Ann Dechairo Marino, PhD, RN, who has been at the nursing helm at Providence Holy Cross Medical Center in Mission Hills, CA, for 2 months. She made a somewhat lateral move from the CNE’s office at Northridge Hospital in Northridge, CA, in November. For Dechairo Marino, the decision to move was decided by two things: a longstanding admiration for the Providence Health system and the fact that Holy Cross is a Magnet facility.

“The particulars are different, but the core is the same,” Dechairo Marino said of her transition. “I have spent my whole career trying to improve practice environments to improve nursing practice. I’ve done it in a number of hospitals across the state, but I really wanted to be in a Magnet institution. This wonderful practice environment attracts and retains the best nursing professionals as well as the best clinical professionals and physicians. [This] is key because it takes a whole hospital to earn Magnet designation — everyone has to support the practice environment. It’s a collaborative environment and the research shows that collaboration between excellent clinicians leads to better patient outcomes. That’s what it’s all about.

“I had achieved all the things that are supposed to define a successful career: earning a PhD in nursing, being a CNO and directing positive change for several organizations, being recognized as a nurse leader both in California and across the country,” Dechairo Marino shared. “But, as I looked back at my career, I wondered what would be next. I wasn’t ready to retire or fill interim positions, but I knew it was time for a change. When I got the call, I decided it was what I needed to do. I still wanted to be a nursing leader at a hospital that can help make a difference. That’s who I am. Holy Cross is a wonderful place, and I decided it was where I needed to be.”

Candy Goulette is a frequent contributor to ADVANCE.
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Needlestick

Sticking to the Law

The Needlestick Safety and Prevention Act of 2000 has reduced preventable sharps injuries among nurses. But is it enough?

When the American Nurses Association mobilized a national campaign in 1999 to raise awareness of the need to protect nurses from potentially life-threatening needlestick injuries, the program’s name said it all: “Safe Needles Save Lives.” Today, ANA has relaunched that history-making campaign, but this time there’s a big difference: “Safe Needles Save Lives — It’s the Law.”

The law is the federal Needlestick Safety and Prevention Act (NSPA), signed by President Bill Clinton on Nov. 6, 2000.

Supported by nursing associations and grassroots advocates nationwide, the original needlestick campaign made history because it played a direct role in convincing Congress to pass this landmark legislation.

The NSPA augmented OSHA’s Bloodborne Pathogens Standard, which is designed to protect workers from occupational exposure to bloodborne diseases such as HIV and hepatitis B and C. Specifically, the needlestick law strengthens safeguards against preventable sharps injuries in three areas by requiring healthcare employers to:

- use work practice controls and safer medical devices — such as needleless systems and needles with built-in safety features — to minimize workers’ risk;
- include nurses and other frontline health workers in the process of evaluating and selecting safety devices;
- maintain a confidential sharps injury log.

The law has given nurses unprecedented access to a whole new world of protective technologies, from puncture-proof sharps containers and blunt suture needles, to safety-engineered syringes that retract, sheathe or blunt the needle after use.

But in the 11 years since NSPA passed, how much of a difference has it really made in reducing sharps injuries to nurses?

Injuries Down

“We’ve seen all categories of healthcare workers experience decreases in injuries since the passage of the law — not just nurses, but across the board,” said Elayne Kornblatt Phillips, PhD, MPH, RN, FAAN. “There have been some ups and downs in injury rates over the years, but they never approach those from before the legislation. The law has definitely had a significant impact on safety in the workplace.”

The statistics bear this out. In 2010, IHWSC published results of a study that analyzed sharps injury data from 87 U.S. hospitals from 1993-2006, comparing injury rates in surgical and nonsurgical settings before and after the law was enacted. The findings were dramatic: After the legislation, percutaneous injury rates in non-surgical settings plummeted by 31.6 percent.

Furthermore, 97 percent of nurses surveyed for the ANA-sponsored 2008 Study of Nurses’ Views on Workplace Safety and Needlestick Injuries reported safety syringes are available in their workplace. The CDC estimates using safer devices can prevent between 62 percent and 88 percent of sharps injuries.

“Sales of these safety-engineered devices skyrocketed in the years immediately after the legislation,” Phillips said. “Nurses prefer these devices and use them, and that certainly has helped reduce injuries.”

“We Can Do Better”

But despite these advances, nursing leaders agree there is still more work to be done.

“We’ve made progress in many areas,” said ANA President Karen Daley, PhD, MPH, RN, FAAN. “But we’re not as far along as I’d like us to be. Laws, in and of themselves, don’t fix problems. It takes a great deal of effort beyond simply passing legislation to really have an impact.”

While sharps injuries have declined substantially in non-surgical settings since 2001, they have actually increased 6.5 percent in operating room settings, the University of Virginia study found. And as late as 2008, almost two-thirds of nurses ANA surveyed reported being accidentally stuck by a needle while working. Even more alarming, nearly 75 percent were from contaminated needles.

“Safe devices don’t guarantee safety,” said Jaime Murphy Dawson, MPH, of ANA’s Center for Occupational and Environmental Health. “Even though these devices are available, that doesn’t mean...”
needlesticks aren’t going to happen — because they are happening, and they’re happening much more frequently than they should.”

Daley, a nationally recognized advocate for needlestick prevention since contracting HIV and hepatitis C in 1998 from a sharps injury while working as an emergency department nurse, believes the key to achieving even greater progress under the law is a combination of increased awareness, education, reporting and enforcement. That’s why ANA commemorated the 10th anniversary of the needlestick legislation in November 2010 by reintroducing Safe Needles Save Lives.

“Our intent in relaunching the campaign is to say ‘We can do better;’” Daley explained. “We [want this to be] a wake-up call, because even 10 years after the legislation passed, there are still many nurses around the country who don’t realize they have rights and that there are tools available that prevent these injuries.”

Rights & Resources

The Safe Needles Save Lives — It’s the Law website, www.needlestick.org, offers a wealth of information to help nurses and employers understand their rights and responsibilities.

These resources include a sharps safety webinar, fact sheets and a free online Needlestick Safety & Prevention CE course. There’s also a comprehensive Needlestick Prevention Guide filled with checklists and step-by-step guidelines for evaluating safety devices, responding to and reporting sharps injuries, and much more.

Another helpful resource is the “STOP STICKS” campaign (www.cdc.gov/niosh/stopsticks), an awareness-building program the CDC’s National Institute for Occupational Safety and Health developed.

Targeted primarily to OR and ED settings, where nurses are at particularly high risk for bloodborne pathogen exposures, the CDC campaign provides materials to help healthcare facilities design and implement customized safety campaigns and “communication blitzes” to educate their workers about sharps-injury prevention.

One of the most empowering messages of ANA’s Safe Needles Save Lives is nurses must hold their employers accountable for complying with the NSPA and, as Daley says, “refuse to accept anything less.” For example, Dawson notes that far too many nurses still report they do not have a voice in the selection of sharps safety devices in their workplaces, even though the law clearly mandates this.

“Enforcement is absolutely critical,” Daley emphasized. “ANA always encourages nurses to work through the normal chains of command within their organizations. But if reasonable attempts to advocate for change and improve safety aren’t successful, all healthcare workers are entitled under the law to anonymously report perceived violations to OSHA. The first step in holding employers accountable is for nurses to know exactly what the law says and what their rights are.”

Pam Chwedyk is a contributor to ADVANCE.

Want more information on healthcare laws?

Check out “The Politics of Healthcare” blog to learn more about the latest developments in healthcare policy and legislation at www.advanceweb.com/NurseBlogs.
Sarah, a 4-year-old female, presents to the emergency department with a 2-day history of vomiting and diarrhea. She has had 10 episodes of vomiting (clear, then yellow-tinged) and 8 episodes of diarrhea (mucus-like material in the first few episodes, and red in color in the most recent).

At home, she was given a sports drink (red color) and Pedialyte. Her mother reports her temperature at that time was 101° F. Despite the attempted rehydration at home, she continued to have diarrhea and vomiting. She looks pale, feels weak and is tired.1

Among children in the U.S., fluid and electrolyte imbalances associated with gastroenteritis account for the majority of cases of dehydration. Poor fluid intake, vomiting and other illnesses can also contribute to this critical pediatric problem.2

In developing countries, diarrhea and dehydration kill more children than AIDS, malaria and measles combined, according to a report issued in October 2009 by UNICEF and the World Health Organization. 3

Other causes include increased fluid output as a result of renal and GI conditions, as well as insensible losses such as increased respiratory rate, age, pain and being ventilator-dependent.

Fluid shifts from ascites, effusions and capillary leaks, such as burns and sepsis, can all result in total body water reductions in the extracellular and intracellular volumes. When the intravascular volume decreases and dehydration progresses, hypovolemic shock can lead to end-organ failure and death.4

Children under age 5 are at highest risk for dehydration because of their higher body water content, renal immaturity and inability to meet their own needs independently. Older children exhibit signs of dehydration before younger children because they have decreased amounts of extracellular fluid volume.

Body Composition
The body’s composition related to the percentage of total body water and body weight varies from 60 percent in adults to 75 percent in full-term infants.4 Premature infants are about 83 percent water. Interstitial fluid, which typically accounts for 15 percent of body weight, is the main component of extracellular fluid. An adult has about 11 L of interstitial fluid, which surrounds the cells and aids cellular metabolism.

Total blood volume is 8 percent to 9 percent in children and 7 percent in adults. This is because blood cell elements are not considered body water. A few more percentage points thus account for the actual circulating blood volume that is larger than the circulating plasma volume.1

Osmolarity & Severity
Besides total body water lost in dehydration, it is important to determine serum osmolarity (solute concentration). Differentiating between isonatremic (isotonic), hyponatremic (hypotonic) and hypernatremic (hypertonic) dehydration is critical to determine dehydration severity. Serum sodium serves as a good marker to assess osmolarity if the patient has a normal serum glucose level.

The most common type of dehydration is isonatremic, occurring in 80 percent of all patients. Hyponatremic and hypernatremic dehydration each account for about 10 percent of all cases. Neurologic complications can occur in patients with hyponatremic or hypernatremic dehydration. Rehydration in the hospital setting should be done with this in mind. Rapid changes in sodium levels can result in neurologic complications, including severe cerebral edema.

Clinical Signs & Symptoms
When Sarah was admitted to the ED and examined by a pediatrician, the first signs and symptoms assessed were:

- Amount of weight loss, which usually correlates to degree of dehydration in children. Generally, a weight loss of 5 percent indicates the child is 5 percent dehydrated (mild to moderate).
- How much and how often the child is urinating. This is not always a reliable sign even if the child is severely dehydrated. Children may continue to urinate frequently. The parents of children who are old enough to toilet independently may not know when or how much a child is voiding.
- Presence of tears, a moist mouth and tongue; capillary refill less than 2 seconds; instant recoil on skin turgor test.5

Sarah’s physical exam revealed vital signs of 38.2° C (100.8° F); P 110; R 45 (elevated for age); BP 90/65; O2 saturation 100 percent on room air; weight 18 kg (39.6 pounds, or slightly higher than the average 35 pounds for her age/gender); capillary refill time is 2 seconds over; her chest and skin turgor feels somewhat diminished; she is alert and cooperative, and reportedly has urinated only once in 15 hours; her eyes are not sunken.

The physician determines Sarah is mild-to-moderately dehydrated based on clinical indicators, e.g., her 5 percent weight loss. There is
no definitive lab test for dehydration unless comorbidities are present or the child is severely dehydrated, i.e., greater than 9 percent weight lost with marked changes in mental status and vital signs. For example, if a child has diabetes, the clinician would follow serum electrolytes to rule out ketoacidosis. Serum sodium should be determined because hyponatremia and hypernatremia require specific treatment regimens.

**Gold Standard of Rx**

The American Academy of Pediatrics recommends oral hydration therapy (ORT) as the preferred treatment of fluid and electrolyte losses caused by diarrhea in children with mild-to-moderate dehydration. The goals of ORT are restoring the circulating blood volume, restoring the interstitial fluid volume, avoiding acidosis and maintaining rehydration. ORT is as effective as IV fluid, although not as prompt, in the rehydration of children with mild-to-moderate dehydration and there is no difference in failure rate between hospital admission and home care treatment.2

The advantages of ORT are it can be done in the home, with fewer and shorter ED visits; parents are more satisfied; the same fluid can be used for rehydration, maintenance and replacement of stool losses; and it can be initiated more quickly than IV therapy. ORT also can be administered through a nasogastric tube instead of IV therapy.

Contraindications to ORT are altered mental status with risk of aspiration, abdominal ileus and intestinal malabsorption.

**Administration of Fluid**

A number of commercially prepared oral hydration therapies are available to treat mild-to-moderate dehydration (see Table). These solutions are recommended over homemade solutions to prevent errors in preparation.

ORT is effective because sodium and glucose can be passively transported with fluid from the gut lumen into the circulation. The fluid deficit should be replaced over 4 hours. Generally, 5 mL every 1 minute is tolerated by the child. At home, however, caregivers may give the child 30 mL every 15 minutes. At that rate the child often continues to vomit and may be taken to the ED.1

After the 4-hour period of rapid infusion of ORT, maintenance fluids should be given and ongoing losses replaced every 2 hours. Maintenance therapy includes providing for water and electrolyte needs over the next 24 hours, during which time the caregiver should record accurate intake and output.

Traditional fluids given for diarrhea and minimal diarrhea, such as apple juice, ginger ale and milk, do not constitute adequate ORT because many of these contain too much sugar and low concentrations of sodium. This inhibits water absorption and can cause more diarrhea. Antidiarrhea medications for children are contraindicated because of some evidence they may actually decrease diarrhea and can possibly result in toxicity.

If the child continues to vomit, IV fluids of isotonic sodium chloride or Lactated Ringer’s solution should be initiated. The amount of fluid to be administered is measured according to the child’s weight, age and amount of fluid loss. The child may begin an age-appropriate diet as soon as he can tolerate oral intake.

Since Sarah was brought to the hospital, the most efficient and cost-effective form of rehydration was treatment with IVs in the ED. After the IV was infused, Sarah was discharged with instructions to rest and continue oral hydration.

References for this article can be accessed at www.advanceweb.com/Nurses. Click on Resources, then References.

Kay Bensing is senior staff nurse consultant at ADVANCE.

### Oral Hydration Solutions

<table>
<thead>
<tr>
<th>SOLUTION</th>
<th>CARBOHYDRATE (g/d/L)</th>
<th>SODIUM (mEq/L)</th>
<th>POTASSIUM (mEq/L)</th>
<th>BASE (mEq/L)</th>
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<tbody>
<tr>
<td>Pedialyte</td>
<td>2.5</td>
<td>45</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Infalyte</td>
<td>3</td>
<td>50</td>
<td>25</td>
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</tr>
<tr>
<td>Rehydralyte</td>
<td>2.5</td>
<td>75</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>UNICEF/WHO</td>
<td>2</td>
<td>90*</td>
<td>20</td>
<td>30</td>
</tr>
</tbody>
</table>

* The increased sodium in the UNICEF/WHO solution is necessary when the source of diarrhea is cholera and fluid losses are excessive.
Jane is a 45-year-old, premenopausal female diagnosed with type 2 diabetes 5 years ago by her primary care provider. She is 5 feet, 5 inches tall and weighs 130 pounds with a BMI of 21.67 (normal). Her BP is 126/84 and her lipid panel results are normal. Her fasting blood sugar is 130 mg/dL; 2-hour postprandial glucose 200 mg/dL and her glycated hemoglobin (A1c) is 7.8 percent; normal for a non-diabetic is <5.7 percent.

Today, A1c has replaced the glucose tolerance test as the gold standard to diagnose diabetes. It also is used to measure adherence to a patient's treatment plan. The test shows blood sugar levels over a 3-month period, but it doesn’t replace daily glucose monitoring.

The symptoms Jane describes to her clinician are 2 months of extreme fatigue, and increased thirst and urination. She also notes her family told her she had become irritable in the morning before breakfast. Recently, Jane says, she lost 5 pounds without dieting.

Jane is referred to a certified diabetes educator (CDE), a nurse who instructed her during several weekly visits about type 2 diabetes. The CDE discussed risk factors and how the disease is diagnosed and managed, emphasizing the balance of diet, exercise and possibly prescribed medications to control blood sugar, blood pressure and lipids. The CDE explains the pathophysiology of type 2 diabetes with simple graphics and no medical jargon. At a later session, Jane is taught about the complications of the disease and how she could prevent them.

Innovative Program
At Advocate Lutheran General Hospital, Park Ridge, IL, reducing the annual national cardiovascular disease (CVD) mortality rate of nearly 10 million people is an organizational goal. Because diabetes is a major risk factor for CVD, the collaboration between the cardiology staff, diabetes practitioners and other departments is a comprehensive inpatient and outpatient effort.

Gina Littlejohn, BSN, RN, coordinator of the Risk Evaluation in Action for Cardiovascular Health (REACH) program, explained that, upon admission to the hospital, patients are screened for CVD risk factors. “Since the REACH program began in 2001, we have seen an improvement in the use of secondary risk-reduction medications in the high-risk populations, with a significant improvement in use in the stroke population,” explained Littlejohn.

In 2009, an institutional review board study using email was initiated to provide a weekly medication reminder email and medication tips. There are 311 patients with diabetes in the study, the coordinator noted.

Coordinated Cardiac Care
Currently, the patients in the study are being followed to determine if this program can improve medication compliance and reduce risk factors: in this case, diabetes.

“Once the patient is initially screened, the attending physicians are notified electronically of the patient’s risk factors,” Littlejohn explained. “So, while the patient is in the hospital, changes can be suggested in the treatment plan, [e.g.], lifestyle changes or new medications.”

Before a patient is discharged from the program, a nurse completes a cardiac risk-reduction assessment and discusses it with the patient. The coordinator reported there has been improvement in core measures for acute MI and increased risk-reduction strategies in the CVA population.

Post-Discharge Care
Many of the patients discharged from Advocate Lutheran General Hospital receive their outpatient care at the hospital’s Diabetes Care Center. Carol Victor, APN, CDE, sees many of the patients in the REACH program. “Usually, I follow up with these patients 4-8 weeks post discharge,” she said.

Littlejohn and Victor emphasized they work hard to help patients learn to set small, attainable goals for themselves and to celebrate when they reach these goals. Victor explained, “We don’t rely on BMI as much as waist circumferences, [i.e.], >40 inches for men and >35 inches for women. This measures the abdominal fat, which is more of a risk factor than the BMI.”
**Diabetes, CVD & Obesity**

CVD is the leading cause of morbidity and mortality in individuals with diabetes types 1 and 2. In patients with type 1 diabetes, microvascular complications include retinopathy, nephropathy and neuropathy. It has been well-documented that strict glycemic control with these patients reduces or prevents these complications. Patients with type 1 diabetes also develop macrovascular CVD complications.

Adults with diabetes type 2 have a two- to fourfold higher risk of CVD, specifically MI, stroke, heart failure and peripheral artery disease, compared to those without diabetes. Discussion here includes risk factors with type 2 diabetes only.

In 2006, Circulation reported that the American Diabetes Association/American Heart Association issued a scientific statement about CVD, diabetes and obesity. "Overweight or obesity results in a wide range of related risk factors and many fatal and non-fatal conditions. Paradoxically, although we have witnessed decades in which heart disease and stroke have steadily declined ... the prevalence of diabetes has soared. The increase in diabetes can largely be attributed to weight gains, and it threatens the enormous advances in disease prevention programs we have seen."  

**Not a Perfect Pathway**

While researchers agree excess weight predisposes many adults to hypertension, dyslipidemia, diabetes and ultimately CVD, there is evidence to support this pathway is much more complex than this sequential algorithm. For example, 1) Studies show hyperglycemia at prediabetic levels is an independent risk factor for CVD. 2) Central obesity (i.e., intra-abdominal or visceral fat) may have a greater detrimental effect than all-over fat distribution and increased BMI. 3) Obesity without glucose intolerance is related to coronary artery disease, stroke and heart failure.

**Insulin Resistance**

Type 2 diabetes is most commonly associated with coronary artery disease and other forms of heart disease. The process starts with insulin resistance, often occurring years before diabetes is diagnosed.

"Up to 80 percent of obese people compensate for their insulin resistance by oversecreting and don't become diabetic," said Guenther Boden, MD, Temple University, Philadelphia. "In the remaining 15 percent to 20 percent, the pancreas is unable to compensate for insulin resistance and they become diabetic."

When people are insulin-resistant, the pancreas attempts to meet the body's energy needs by oversecreting insulin. When this compensatory mechanism can't be maintained, excess glucose is produced and the person is at risk for type 2 diabetes and heart disease. Many people have elevated levels of blood glucose and insulin circulating in the blood simultaneously.

Insulin resistance and type 2 diabetes are associated with accelerated atherogenesis from early fatty streaks to later obstructive lesions that evolve into plaques prone to rupture; a prothrombotic, antifibrinolytic and systemic inflammatory state; and functional and structural deficits that can progress to arterial and left ventricular compliance.

**Adherence Wanes**

For 2 years after Jane's diagnosis of type 2 diabetes, she adhered to her treatment. However, in the past 3 years, she had more stress and gained 25 pounds. She presented to her clinician with occasional, non-specific chest pain. She was referred to a cardiologist who revealed she had increased lipid levels, an AIc of 8 percent and a blood pressure of 160/92. Her stress test indicated mild-to-moderate angina pectoris but no evidence of myocardial ischemia. She was started on a small dose of insulin and her oral diabetic meds were changed. She was also prescribed anti-lipid meds and aspirin, and given an exercise plan. Her diet was reviewed. Six months after Jane had developed cardiac symptoms, she had lost 10 pounds and her AIc was 7.2, she was exercising and the pain had decreased.

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Kay Bensing is senior staff nurse consultant at ADVANCE.

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Titans of Technology

Advancements have improved charting, workflow, safety, time at the bedside and more, nurses at the ‘Most Wired’ facilities say

By A. Trevor Sutton

Just more than a decade ago, the inaugural list of the “Most Wired Hospitals” in the U.S. was compiled by Hospitals & Health Networks, a trade magazine published by an American Hospital Association subsidiary.

But while the advent of wireless technologies might make “Most Wired” seem slightly archaic, wires or no wires, it is always an honor to make it on the annual list of the most technologically advanced hospitals in the country.

System Synchronization

Technology provides patients with a more efficient and safer healthcare experience, but it is also rapidly becoming a patient expectation, said Karen Klucky, MSN, RN, director of nursing informatics at Elliot Hospital, Manchester, NH. “Patients expect that their care will utilize technology,” she said.

Among other technology, Elliot Hospital utilizes electronic health records (EHRs) and computerized physician order entry (CPOE). Both systems provide for fully computerized patient data.

“The benefit of an electronic medical record is that it provides real-time information at the point of care. We have immediate retrieval of lab results, doctor’s orders and consent forms. It truly expedites the nursing task and provides optimum workflow,” Klucky said.

At Elliot and most technologically advanced facilities, EHRs are complemented by CPOE. The system creates a closed loop between a provider’s orders, medication and the patient, Klucky noted.

When used together, CPOE and EHR systems provide hospitals with cutting-edge care that attracts new patients. Technology can work to attract new employees as well.

“I have been with Elliot for about 6 months now, [and] I was actually enticed to work here because they are so committed to utilizing technology,” Klucky said. “The entire organization embraces technological advancements.”

Improved Data Flow

Once a computerized patient information system is in place, a plethora of useful tasks can be performed.

“The technology we use offers a better flow of data. We know that patient information is hitting the system in real time; there is no data lag,” said Anna McSorley, MS, RN, assistant manager of clinical applications at CentraState Medical Center, Freehold, NJ.

This improved, real-time flow of data allows for best-practice nursing care to be more easily implemented and, ultimately, results in safer medical care by allowing the facility to create “workflows,” McSorley added.

Nurses, with their constant patient contact, have a wellspring of ideas when it comes to effectively utilizing technology.

“Many of our technological ideas come from nurses,” McSorley said. “The concept for the workflows came from nurses. Very often, nurses are the ones doing direct patient care and they see how technology can be used to improve functioning.”

At the Bedside

Technological advances enable nurses to better educate patients at the bedside as well, said Victoria Tyler, BSN, RN, clinical coordinator at William W. Backus Hospital, Norwich, CT.

“It is incredibly helpful to pull up information at the bedside,” she said. “We have a real-time language interpreter system that allows us to immediately bring up an interpreter on a computer screen. It makes language barriers very easy to overcome.”
The time saved through use of a computerized translator system is an example of how technology allows for more personal contact between patient and nurse, Tyler added. “Technology allows for more face-to-face time with patients. When your paper chart is digitalized, you are not constantly searching for what and when something is due,” she said.

Along with EHR, CPOE and webcam translators, Backus also utilizes medicine barcode scanners.

**Added Security**

Encryption and passwords utilized by EHR, CPOE and other technologies help keep patient information out of the wrong hands.

“When it comes to point-of-care, we have PCs in every patient room and use what is called ‘terminal services.’ This allows nurses to securely access a session at the nursing station and then access the same session when they arrive in the patient’s room. It all hinges on the usage of smart cards,” said Greg Melitski, BSN, RN, nursing liaison to the Information Services Department at Hunterdon Medical Center, Flemington, NJ.

With terminal services, hospitals easily exceed patient privacy requirements, he noted.

**Seamless Exchange**

To stay on the cutting edge of technology, hospitals have to constantly be working on the next big thing.

“Currently, we are looking at how we can seamlessly share necessary patient information with other regional practitioners,” McSorley noted.

Added Melitski: “Health information exchange is the next big thing in healthcare technology. This allows for all regional systems to communicate more effectively. This way, the primary care physician’s information is patched into the hospital.”

Rather than functioning as silos of information, hospitals and primary care physicians can share vital information about their patients faster — and save lives.

A. Trevor Sutton is a frequent contributor to ADVANCE.
Uloric (febuxostat) is a nonpurine selective inhibitor of both oxidized and reduced forms of xanthine oxidase. This medication is used for management of hyperuricemia in adults with gout, and was approved by the FDA in February 2009. Uloric is the first agent approved for the treatment of chronic gout since allopurinol was approved in 1964.

**Mechanism of Action**
Xanthine oxidase is an enzyme that causes the conversion of hypoxanthine to xanthine, then converts xanthine to urate when purines are degraded into uric acid. Uloric inhibits both forms of xanthine oxidase, thus decreasing uric acid, the buildup of which can cause redness and painful swelling in affected joints.

**Dosage, Pharmacokinetics & Cost**
Uloric is readily absorbed when given orally and reaches its peak in 1 hour. It is 99 percent protein-bound, and has a half-life of 5-8 hours. The drug is excreted in urine and feces, and meals high in fat will delay its absorption.

The recommended initial adult dose is 40 mg daily. This dose may be increased to 80 mg daily if the patient's serum uric acid level does not decrease less than 6 mg/dL after 2 weeks.

In patients with mild to moderate renal impairment, no dosage adjustment is needed; but not enough data is available for the use of Uloric in patients with severe renal impairment. No dose adjustment is needed in patients with mild to moderate hepatic impairment, but Uloric has not been studied in patients with severe hepatic impairment.

The cost of Uloric is currently higher than its competitor, allopurinol, which is available as a generic. The reported price for a 30-day supply of Uloric in the U.S. is $184.

**Interaction**
Uloric may increase the serum concentration of azathioprine, didanosine and mercaptopurine. The medication’s U.S. labeling recommends using caution in patients receiving theophylline due to the risk that it may increase active metabolite.

There was no effect on the concentration of Uloric when administered with antacids. Despite being highly protein-bound, no clinically significant interaction was observed between Uloric and warfarin.

**Side Effects**
The most common side effects, occurring in 1 percent of patients receiving Uloric and at a rate 0.5 percent greater than that seen in the placebo group, were liver enzyme elevations, nausea, arthralgias and rash.

Animal studies have demonstrated increased neonatal mortality and low birth weight. No teratogenic effects were noted. No well-controlled studies have been done in pregnant women. Uloric should only be used if potential benefit to the mother outweighs potential risk to the fetus.

Excretion in breast milk is unknown.

**Monitoring Parameters:**
Liver function tests should be done 2-4 months after initiation and periodically thereafter. Serum uric acid levels should be done about 2 weeks after initiation.

Meeakshi Khatta is a nurse practitioner in the division of cardiology at University of Maryland Medical System, Baltimore.

**Rx Update**

**Uloric for Gout**

Xanthine oxidase inhibitor is first approved treatment in adults in nearly 50 years

By Meenakshi Khatta, CRNP
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