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Pharmacists need to be involved in a pain management team

Experts offer examples of support role

Hospitals need a pharmacist who specializes in pain management on board, although this model hasn't taken off as a trend as quickly as many experts in the field believe it should.

"There really wasn't a lot of recognition of health systems even needing pain services until the 1980s with the hospice movement," says **Virginia Ghafoor**, PharmD, a clinical pharmacy specialist in pain management at the University of Minnesota Medical Center—Fairview in Minneapolis, MN, and a clinical pharmacy specialist in pain/palliative care at Fairview Ridges Hospital in Burnsville, MN.

As hospice and palliative care programs began to grow, there was an evolution in health systems offering pain management services, she adds.

"In the 1990s, we started seeing the impact of the aging population having pain problems, including degenerative joint diseases, neuropathic pain, and other types of chronic pain," Ghafoor says.

This led to the development of new drugs for treating neuropathic pain, including gabapentin (Neurontin®) and pregabalin (Lyrica®), Ghafoor notes.

"So what has happened is there's a growing demand to have people who are specializing in chronic pain for both pain management and for a multidisciplinary approach," she explains. (See story on building a pain management model that includes pharmacists, p. 16.)

"Pain is a big topic," says **Lee Kral**, PharmD, BCPS, a clinical pharmacy specialist in pain

Summary points

- Hospitals have adopted pain management approach, but are slower to create pain specialist role for pharmacists.
- Pharmacists could assist physicians in managing complex pain cases.
- ASHP is working to advance pharmacists' knowledge of pain medication.

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medicine at the University of Iowa Hospitals and Clinics in Iowa City, IA.

Pain medication management involves psychosocial, substance use, regulatory, and diversion/abuse issues, making it a very complex pharmacy specialization, the experts say. (See story on handling the complex issues related to pain management, p. 17.)

"A lot of the issues we face are post-op pain, and that's huge—especially in hospitals," she adds. "If you don't have a team that goes around and sees patients in the recovery room, then pain management can be a problem."

While every pharmacist should have a basic knowledge about pain medicine, there's also a need for pharmacists who are specialists in pain medicine, Ghafoor says.

Hospitals increasingly are asking pharmacists to start pain services, and the pharmacist's role in pain services needs to grow, but there also needs to be more resources budgeted to train pharmacists in this practice, Ghafoor says.

"A lot of pharmacists have learned about pain medicine on the side, and they really don't have a lot of formal training," she adds. "They need more structured training before they take on a service like this all by themselves."

The problem is that pharmacists traditionally receive only a few hours of pain medicine education as students, so most of the training comes post-graduation, says **David S. Craig**, PharmD, BCPS, a clinical pharmacist specialist and residency director in psychosocial, palliative care, and integrative medicine at Moffitt Cancer Center in Tampa, FL.

"There's a big movement in hospitals to incorporate palliative care in end-of-life care and pain management," Craig notes. "And this is one of those areas where hospital pharmacists can get involved with patients."

But the pharmacists will need to be trained in pain medicine, he adds.

Hospital pharmacists often are too busy to obtain the training on their own, and hospitals typically do not invest in creating a role for a pharmacist pain medicine specialist, Craig says.

"We have a pharmacy pain management program here, and there are two others in the United States," Craig says. "So that makes three pain management pharmacy programs in the United States."

Hospitals are recognizing the need for better pain management, however.

"What you find is that hospitals have been forced into looking at pain management in a much more serious light because of recent Joint Commission [on Accreditation of Health Care Organizations] standards," says **Christopher Herndon**, PharmD, BCPS, an assistant professor at Southern Illinois University—Edwardsville in Edwardsville, IL.

"This makes it a perfect storm for pharmacists to be involved," Herndon adds.

The American Society of Health-System Pharmacists (ASHP) recently featured an all-day session on pain management at its 43rd Mid-Year Clinical Meeting, held Dec. 7-11, 2008, in Orlando, FL. Craig, Ghafoor, Herndon, and Kral spoke about pain management at the conference.

ASHP is working to develop pain medicine residency standards for pharmacists, Craig says.

"ASHP is trying to highlight and inform hospital pharmacists who are out of school and practicing now to give them the tools they need to incorporate these standards into their own practices," he says. "But this is only for the pharma-

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Editorial Questions

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cists who are motivated and interested in the pain medicine field; it'd be nice if there were standards for all hospital pharmacists."

For example, pharmacists in community hospital settings can play a big role in helping manage acute pain for patients post-surgery, Craig says.

"One of the issues that always comes up is how do you effectively manage the patient's pain when the patient has a substance abuse disorder or a psychiatric disorder," Craig says. "Those patients become a challenge for most clinicians, and so physicians will ask for assistance with that, and pharmacists should be involved." (See **tips on pain medicine strategies, p. 20.**)

The University of Iowa Hospitals and Clinics has about 100 pharmacists, including many who are involved in internal medicine and patient care issues that also involve pain management, Kral notes.

"But what's unusual is we actually pay one pharmacist—me—to do nothing but pain management full-time," Kral says.

At the minimum, it's important to have a pharmacist involved in the pain management team, Kral and other experts say.

Hospitals are beginning to create teams of pharmacists and nurses to run inpatient pain and symptom management programs, and a number of larger teaching institutions now have pharmacists involved in their pain teams, Herndon says.

But this hasn't translated into creating pain management pharmacy specialists as is ideal, he notes.

"We did a large survey of hospitals three or four years ago, asking what is the largest thing precluding hospitals from assigning a pharmacist either full-time or part-time to pain management, and it all came back to resources and budget," Herndon explains. "The doctors are all for it and the directors are for it, but it's a soft cost service because we can't bill for it."

There are a number of reasons why pain management should include pharmacy input, including the following:

- **Physicians need assistance:** Physicians on rounds might decide to make changes to patient's opioid use, and if they do, the pharmacist is the person they might call for assistance.

"Pharmacists are the best practitioners in a hospital setting to be responsible for the ongoing monitoring and adjustment of in-house pain and symptom management," Herndon says. "A lot of hospitals are realizing this, and if the resources are there to free up pharmacists, then that's the dream."

- **Hospitals are enhancing palliative care services:** Many hospitals are starting to add or enhance their palliative care services, Herndon says.

"A large reason for this is to provide better patient care," he adds. "This is a way for pharmacists to get involved in an area where hospitals already are putting resources."

For instance, Herndon is associated with a hospital that doesn't have an inpatient pain management team, but it does have an inpatient palliative care team.

"We are utilized as an inpatient pain service group," Herndon says.

- **Pharmacists can help with patient screenings and monitoring:** It helps to have a pharmacist on board, particularly in the more complicated pain medicine cases.

Some patients with little opioid experience could become over-sedated, a problem that easily could be prevented if a pharmacist was involved to evaluate and monitor the patient's situation, Kral says.

"Floor nurses with 6-8 post-op patients don't have the time and resources to more acutely monitor a patient's pain," Kral adds.

"We monitor for possible acute renal insufficiency post-operation," Kral says. "Does the patient have sufficient renal output and are the kidneys clearing the medicines?"

Also, the University of Iowa Hospitals and Clinics' pain medicine team screens patients for undiagnosed sleep apnea, since these patients may be at risk for respiratory depression with opioids, she says.

"Also, it's important to know if the patient has been on opioids at home because if they've been taking opioids at home and then come in for knee replacement surgery, then their pain needs post-operatively will be greater, and sometimes that's not covered adequately," Kral says. "So a pharmacist on these teams makes sure the home medications are either restarted or the pain is covered with some kind of infusion or patient controlled analgesia (PCA) opioid doses."

The point is that pharmacists should be involved in hospital pain management and palliative care because of the skills and knowledge they can bring to the role, Herndon says.

"I really think this is an area where pharmacists excel above other providers or other allied health care professionals because of our knowledge of the way medications work and how they are dosed," Herndon says. "There are so many

things that go into keeping patients on so many pain medications, and this is an area that physicians are willing to delegate.” ■

Health system’s pain management model has safety, service advantages

Developing inpatient pharmacy model is challenge

Hospitals could improve the overall care of patients who are admitted for surgery, palliative care, or for diseases that result in chronic pain if they employ a pharmacist to assist with medication utilization and develop defined medication plans for the more complex cases, an expert suggests.

“There are a lot of safety issues associated with opioids and other narcotics,” says **Virginia Ghafoor**, PharmD, a clinical pharmacy specialist in pain management at the University of Minnesota Medical Center—Fairview in Minneapolis, MN. The health system, which is the largest in Minnesota, has nine hospitals and the university medical center.

“Pharmacists monitor medication doses and review the combined medications used with patients to follow safety practices for preventing over-sedation and overdosing of patients,” Ghafoor adds.

Ghafoor works at the University of Minnesota Medical Center, which has 800 beds, and on Mondays and Thursdays at a community hospital that has 180 beds in a pain and palliative care service model that includes pharmacy support.

“My challenge has been to look at the development of an inpatient pharmacy model in the community hospital setting,” Ghafoor says.

“Our university has a unique model for pain ser-

vice, and the university has three different pain services, including a general pain service with an outpatient clinic where they see acute and chronic pain patients,” she explains. “Then there’s a palliative care service that sees a lot of patients mostly with terminal diseases, and then there’s an anesthesia service that sees patients who have an epidural.”

The institution follows a model, called Mid-Level Practitioner Model for Pain and Palliative Care Services-Clinical Pharmacy Services, which is illustrated in a flow chart. (See table of model, p. 18.)

“I’ve been trying to see how a pharmacist could integrate into this model on an inpatient basis and help with activities that provide a more appropriate utilization of resources,” Ghafoor says.

The pain services model suggests a variety of services a pharmacist could provide, including the following:

- **Finding the right drug for the patient:** “A lot of patients seeking pain management are really ambulatory, primary care patients and could be seen in a primary care setting,” Ghafoor says. “So how many of them are coming through the emergency room with chronic pain needs that could be handled in an ambulatory care setting? We’re looking at models to restructure that process.”

For example, a pain service could develop a pain management plan for a patient with high opioid needs with the goal of reducing their emergency room visits.

“Opioid medications have to be adjusted for each patient,” Ghafoor notes. “These doses are all individualized, and there are a lot of safety issues regarding that.”

The front-line pain management staff checks out a patient’s pain medication history when the patient comes through the door, Ghafoor says.

“If a patient hasn’t been on pain medicine before coming into the hospital then we have a whole different set of prescribing practices,” she says. “Those who have not been on pain medication are at more risk of side effects.”

Alternately, the patients who have been on pain medication may have pain control issues, Ghafoor says.

“Those patients will have higher opioid needs and have more difficulty controlling their pain,” she says.

Those patients can be very challenging because clinicians don’t always recognize all the problems they’ve had with their pain and doses,” Ghafoor

Summary points

- Pain and palliative care service model includes pharmacist interventions.
- Pharmacists assist with improving safety and compliance.
- Pharmacists will help educate patients on drug side effects and interactions and provide follow-up monitoring post-discharge.

adds. "So it's the job for the pharmacist right up front to make sure everything is checked out and we're using the right drug at the right dose for the patient."

On a pain management team, it often is the pharmacist who finds the right drug by assessing drug properties and the patient's medical condition.

• **Improve safety and prevent drug interactions:** A hospital pharmacist who specializes in pain management also could help alert hospital staff to potential side effects when palliative care or hospice patients are admitted and treatment is prescribed for droperidol. When combined with the patients' likely methadone use, droperidol could result in QT prolongation and cause a fatal heart problem, Ghafoor says.

Hospice patients typically are prescribed methadone because hospice reimbursement is low and the cost of some alternative treatments is many times greater than methadone, Ghafoor notes.

"The cost of methadone is 65 cents per day," she adds. "So if hospice or palliative care patients come into the ER, they're most likely on methadone already."

In addition, methadone is a much more difficult drug to dose correctly, so hospitals will need pharmacists' help with these patients, Ghafoor says.

"We've been working to have all clinical pharmacists work together to achieve national patient safety goals around narcotic use both in the ambulatory and hospital setting," Ghafoor says.

"All of our patients are required to check orders for patient-controlled analgesia," she adds. "Pharmacists have to make sure the physician ordered doses appropriately."

• **Help develop better compliance protocols:** This ties in with safety issues, Ghafoor notes.

"Physicians cannot order large ranges of opioid drugs," she says. "They have to keep it within a two-fold range, and that's partially driven from the national patient safety goals."

So if an order is outside of the two-fold range, the pharmacist has to call the physician to get it changed, Ghafoor adds.

Another compliance issue at the hospital system is a requirement that a pharmacist check a patient's opioid history when there is any Sentinel patch prescription of more than 50 mcg/hour, Ghafoor says.

"These patches are not to be used in patients who have never been on opioids prior to coming

into the hospital," she adds. "If you put a patch on someone who isn't tolerant to opioids, the patient could become over-sedated and have life-threatening respiratory depression."

Sometimes a patient will come out of surgery and a patch will be prescribed without anyone having full knowledge of the patient's past opioid use, she notes.

"These situations come up, and the pharmacist has to talk with the physician about the safety issues regarding this, Ghafoor says.

• **Educate patients and plan for follow-up monitoring:** Pharmacists could educate patients before they're discharged through short visits that alert the patient about changes in their medications, Ghafoor suggests.

"You have patients who are on anticoagulation medications, and you have to tell them that you know they have acute chronic pain, but they can't take ibuprofen because it can increase their bleeding time," she adds. "We try to give patients a little bit of advice on medications that could become problematic."

Also, patients need some kind of medication follow-up at the outpatient site, Ghafoor says.

"We've been trying to develop some outpatient collaboration with primary care pain management clinics," she says.

Among the patients who will benefit from follow-up monitoring are those with pain as a primary problem and who are on a terminal progression with their disease, but they're not ready for hospice care, Ghafoor says.

"Those are the ones where I'll work with nurses on an outpatient model," she explains. "A lot of these patients will leave the hospital to go back home, but they want a connection with the clinician in the hospital because they won't have access to a lot of services outside the hospital." ■

Experts discuss complex issues related to hospital pain management

Troubleshooting is big part of job

Hospitals that have pain management teams with pharmacists on board benefit from having a medication specialist help improve safety and improve patient outcomes, experts say.

Pain and palliative care model takes patient from inpatient to discharge

Follow-up treatment is important

The University of Minnesota Medical Center-Fairview follows a multidisciplinary model for taking care of patients experiencing pain.

The model, called Mid-Level Practitioner Model for Pain and Palliative Care Services-Clinical Pharmacy Services, is illustrated in a flow chart that begins with Ridges Hospital where the patient enters into a clinical care setting and continues as follows:

- The patient sees a physician who makes a diagnosis and determines whether medication therapy is required; if there is no need for a consult, the patient next sees a clinical pharmacist manager.
- The clinical pharmacist manager refers patient cases to staff clinical pharmacists for appropriate interventions and coordination of medication therapy.
- Clinical pharmacists will determine the following:
 - the right drug for patient;
 - drug dose and frequency;
 - drug interactions;
 - safety issues;
 - compliance factors;
 - patient education needs;
 - need for referral to pain and palliative care consult service to address complex pain medication therapy regimens;

The physician and clinical pharmacists also can send the patient to prevention/wellness screening or inpatient pain/palliative care service.

- At the inpatient pain/palliative care service, the nurse practitioner or pharmacist will provide a consult for pain or palliative care, collaborate with the social worker and spiritual health services, and provide a discharge reconciliation of pain and symptom medications and clinic follow-up. The patient is discharged.
- Once discharged, the patient receives outpatient pain and palliative care, which include the following:
 - nurse practitioner or pharmacist evaluation of pain or palliative care;
 - discharge follow-up services for pain or palliative care;
 - consult service at clinic site;
 - medication therapy management in concordance with individual patient treatment plans for pain or palliative care;
 - pre-operative pain management plans for complex patients undergoing surgery at Ridges Hospital.

It's a complex issue, says **David Craig**, PharmD, BCPS, clinical pharmacy specialist and residency director in psychosocial, palliative care, and integrative medicine at Moffitt Cancer Center in Tampa, FL.

"How do you control and provide safety for patients with these medicines that can cause harm?" Craig says. "But on the other hand, how do you better manage patients with all types of pain?"

A start would be to hire a pharmacist pain specialist or at least include a pharmacist on a pain management team, says **Lee Kral**, PharmD, BCPS, a clinical pharmacy specialist in pain medicine at the University of Iowa Hospitals and Clinics in Iowa City, IA.

"A lot of hospitals don't have the resources to have someone do pain management full-time," Kral notes. "We're often called upon as pharmacy team members to come up with unique ways to treat pain."

Kral became interested in pain management after practicing in primary care and neurology.

"Most of my day is seeing chronic, noncancer pain patients in the clinic setting, and I also work with the palliative care team at the hospital," Kral says. "We see some cancer patients and some post-operation patients."

"My job here is 80% troubleshooting," Kral says.

For example, Kral had a patient a couple of years ago who had been prescribed a medication that was contraindicated in patients with liver insufficiency.

"I looked at this patient and saw that the person had hepatitis and was having some liver insufficiency," Kral recalls.

So she helped get the patient's prescription changed.

"If pharmacists are consulted for pain manage-

ment in a patient with congestive heart failure, then we'd be reluctant to prescribe an anti-inflammatory because it might cause fluid build-up," Kral says. In another case, a woman

Summary points

- Pharmacists on a pain team help better control pain and symptoms.
- With training, pharmacists can help patients adjust their expectations.
- Pharmacists can come up with novel solutions to pain problems.

with gynecological cancer and who had a toddler was unable to tolerate high doses of opioids because it left her sedated and constipated, Kral recalls.

"We wanted to make her comfortable and mobile with a better quality of life," Kral says. "So we utilized an intrathecal pump to deliver pain medication to the central nervous system to control her pain."

By sending opioids directly to her cerebrospinal fluid, the treatment dose was effective at a considerably smaller dose, and it did not impact the woman's ability to think, Kral says.

"Her bowel function got better, her pain improved, and she was doing great," she adds.

These are only a few examples of how a pharmacist can help improve safety.

But pharmacists also can help patients achieve better pain control by coming up with pharmaceutical solutions, Kral says.

"We had a patient referred to us for refractory hemorrhoidal pain," Kral says. "We couldn't give the patient opioids because that would cause constipation and make passage more difficult and painful, making the hemorrhoids worse."

So when the patient was referred to the pain management team, Kral suggested that they try using a topical medication.

"Opioid receptors are expressed in areas of inflammation, so we could use a topical treatment and add morphine to that to see if we could utilize those opioid receptors that are expressed in the hemorrhoidal inflammatory area," Kral says. "So I called up a compounding pharmacy that's outside the hospital, and the pharmacy made a formulation."

The patient used the topical treatment, and when he returned for a visit six weeks later he reported no pain, Kral adds.

Hospital pharmacists also can assist with the complex psychosocial and regulatory issues related to pain management.

"We need to have more clues and more information about patients and their disease states to do a better job of pain control," Craig says. "Both patients with chronic pain from cancer and non-cancer need better pain control."

The challenge is helping patients with severe, noncancer pain achieve optimal pain control within regulatory boundaries, he notes.

Regulations limit the dosage patients can receive, although there are some exceptions for patients with cancer pain, Craig adds.

"Everyone's greatest concerns are diversion

and abuse," Kral says.

"The medication isn't available to patients usually, and the drugs are locked up with a controlled substances monitoring sheet," Kral says. "So that aspect [of potential abuse] doesn't concern us as much as having a patient bring in a substance to the hospital or having a family member or friend bring it in."

The patient might have been abusing pain medications at home and is doctoring his hospital regimen with the home-based products, she adds.

Or another problem is staff diversion, Kral says. "That's a bigger issue," she notes.

Although the security procedures work well, there is an opportunity in a night shift for a hospital employee to sign out a pain medication for a patient and then not give it to the patient, although it's documented that the patient received it, Kral explains.

"That kind of problem is hard to track down," she adds.

Another reason why pain management is so complex is because of the psychosocial aspect to pain.

"Pain is very subjective," Kral says. "Multiple factors go into how a patient perceives pain, and sometimes there isn't any medication that's going to relieve their pain if the pain is contributed to by a concurrent depression or by social stressors."

This is why pain teams need a pain psychologist who will help patients with chronic pain cope with it and deal with it.

Also, pharmacy pain specialists need to develop skills for dealing with patients' psychosocial issues.

"I tell patients, and they're not very happy when I tell them this, but my personal professional recipe for pain management is 10% interventional, 10% medication, 20% rehabilitative, 20% cognitive therapy, and 40% the patient's motivation and drive," Kral says.

Patients with chronic pain often want a magic pill that will make all of their problems go away, Kral says.

"So it's important to be realistic and pragmatic up front, telling them that we'd like to try this combination of medications for these reasons," Kral explains.

A pharmacist specializing in pain management could educate patients about how the medication will do its part, but the patient also will need to continue improving with his rehabilitation and develop realistic expectations, she says.

"They have to be invested in their own recov-

ery, and many times it's up to me to very gently and supportively say that I don't think whatever medication we give them will be a magic pill, but we're optimistic it will blunt the pain," Kral adds.

"We may not be able to get rid of the pain 100%, but we can help patients get back to a level of functioning that allows them to have their life back," Kral says. "So they can do their jobs and be an active member of their family and friendship circle." ■

Hospital pharmacists can take lead in providing pain medicine guidance

Here are some expert suggestions

Clinical pharmacists have many skills that would be of great use on hospital pain management teams, including conducting thorough medication histories and doing medication reconciliation.

The key is for hospital pharmacists to become experts in pain medicine through post-graduate education and training, says **David Craig**, PharmD, BCPS, clinical pharmacy specialist and residency director in psychosocial, palliative care, and integrative medicine at Moffitt Cancer Center in Tampa, FL.

Pharmacists who have expertise in pain medicine have the skills to best manage patients with acute pain who also have substance abuse and psychiatric illness, Craig says.

As hospital pharmacists increase their experience and knowledge of pain management, here

are some suggestions for how they can help improve patient care for those in chronic pain:

1. Evaluate patient's substance use.

A pharmacist should take a thorough medication history to

find out which pain medication the patient has taken previously and which the patient currently is taking, Craig says.

"If the pharmacist could establish some rapport with the patient where the patient feels like the practitioner needs this information to effectively manage his pain, then he's more apt to give the pharmacist the information," Craig says.

"We often are consulted when primary care physicians need our help with patients who have chronic pain where the typical pain treatment algorithm for post-operative pain is not working," he notes. "Pharmacists can get in there and spend a little more time to find out why we're not making any headway with this particular pain regime."

But pharmacists will need some training to help them find out about the kinds of behaviors that patients are reluctant to admit to anyone.

For instance, a patient might have used opioids illegally and may still be using them. It will take a pharmacist both time and some training in how to develop the rapport necessary to find out this information, Craig says.

Using a pain treatment algorithm, hospital pharmacists could determine whether a patient's pain treatment is adequate or whether it might need an adjustment, he says.

"Most hospitals have a typical treatment for patients who have knee or hip replacement surgery," Craig explains. "But if the patient doesn't do well on the standard anti-inflammatory, then the pharmacist could be helpful in identifying which medicines the patient was taking at home and what other substances the patient was consuming, including smoking and drinking."

2. Ensure patient safety.

"Pharmacists are involved in medication safety in hospitals more than in any other setting, so a pharmacist might determine if a particular dose is appropriate for this patient at her age," Craig says.

For instance, if a patient has a pain medication dose of 100 mg, the pharmacist should do a review to see what dosage the patient has been taking and assess whether the dosage is low, medium, or high for the patient, he says.

The prescription could be inadvisable based on the medication's potency or the patient's own tolerance of the drug, he adds.

Soon, hospital pharmacies will have new tools for ensuring patient safety when two new pain medications are approved, Craig notes:

- A new drug application for Embeda™, a morphine extended-release with sequestered naltrexone hydrochloride, was submitted to the FDA last

Summary points

- Hospital pharmacists could develop rapport with patients to learn the full extent of their pain medicine and substance use.
- Pharmacists could review pain medicine orders to check for tolerance and potency issues.
- Two new drugs submitted to the FDA are designed to be abuse-resistant.

year and was pending a decision as *DFR* went to press.

• The new drug application for Remoxy[®], a long-acting formulation of oral oxycodone for moderate-to-severe chronic pain, was rejected in its present form by the FDA in December 2008, and the FDA said additional non-clinical data will be required to support the drug's approval. No additional clinical efficacy studies were requested by the FDA.

Both drugs were designed to be abuse-resistant, Craig says.

"That's the trend these days to reduce opioid abuse by having commercially available products that are less able to be abused," Craig says.

Patients sometimes will snort or inject oxycodone (OxyContin[®]), so some new pharmaceutical companies have created abuse-resistant products that will prevent tampering through large, extended-release formulation, Craig explains.

"Hospital will have to consider these at some point to be added to the formulary, although they come with additional costs," Craig says. "From a hospital's perspective, I think they possibly could add some additional patient safety."

Opioid abuse is a possibility with all pain patients.

Craig knew of one patient who was crushing oxycodone and mixing it in his chemotherapy port.

"So these new drugs would deter that type of problem, and from a safety perspective they do add something that's not yet available," he says. ■

Researchers find differences in outcomes, costs among diagnoses

Mortality differed by medication, comorbidity

Investigators have found that patients who are admitted to hospitals with heart failure as a secondary diagnosis often had a worse prognosis than those for whom heart failure was the primary diagnosis.¹

Using a large database provided by the National Data Corp. (NDCHealth) of Atlanta, GA, and containing data from about 300 hospitals, researchers screened admissions in 2003 for

either a primary or secondary discharge diagnosis of heart failure.¹

"Since it's a large database we could look at certain trends," says Tien M.H. Ng, PharmD, BCPS, an assistant professor of clinical pharmacy at the University of Southern California School of Pharmacy in Los Angeles, CA.

"For the primary heart failure group, our findings were very similar to the findings of the acute heart failure registries out there," Ng says. "Therapies that target congestion, such as diuretics and vasodilatory agents, seemed associated with better outcomes for patients than when patients received second-line therapies."

Current research suggests a wiser first step is to go after the volume overload of patients who have acute heart failure than it is to try to make their heart pump harder, Ng adds.

The study tied in some of the costs of the care and compared the costs to outcomes.

"The cost of care mirrored what the outcomes would be in those patients," Ng says. "Those who did better had costs that were less."

Overall, pharmacy charges for patients in the database accounted for less than 2% of the total costs, Ng notes.

"So although pharmacy departments like to focus on the drug costs and the bottom line to that department, it's important to understand that some therapies may be a little more expensive," he adds. "But if they lead to improved outcomes they might be more cost effective."

When hospitals use a lot of IV medications in an acute heart failure case it can be quite expensive, Ng says.

"But what these data show is the actual drug costs is a very small component of the overall costs

of managing heart failure patients," he explains. "So sometimes using a medication that may seem expensive from a pharmacy standpoint may lead to an overall lower cost if patient outcomes are improved."

Summary points

- Study finds worse outcomes for patients with CHF as secondary diagnosis than primary diagnosis.
- Pharmacy charges for patients in database were less than 2% of total medical charges.
- Patients receiving diuretics and vasodilatory agents tended to do better than patients who received vasopressors or inotropes.

Investigators also found that patients who were given a secondary diagnosis of heart failure did worse than patients who are admitted for a primary diagnosis of heart failure, Ng says.

"Their outcomes were worse; their costs were worse; their lengths of stay were worse," he adds. "Also, their in-hospital mortality was higher."

Patients with secondary diagnoses of heart failure most frequently had primary diagnoses of acute myocardial infarction, pneumonia, other forms of ischemic heart disease, cardiac dysrhythmias, and chronic bronchitis.

When heart failure was the primary diagnosis, the patients most commonly had secondary diagnoses of ischemic heart disease, essential hypertension, diabetes mellitus, cardiac dysrhythmias, cardiomyopathy, and disorders of fluid, electrolyte, and acid-base.

The study found that when compared to patients admitted for heart failure as a primary reason, these patients with a secondary diagnosis of heart failure were treated less frequently with vasodilatory agents and more often with vasopressor agents. The opposite trend was true of patients who had a primary diagnosis of heart failure.

Specifically, 12% of patients with a primary heart failure diagnosis received a vasodilator and 6.1% of the same group received a vasopressor. By contrast, 7.3% of patients who had a secondary diagnosis of heart failure received a vasodilator, and 10.4% received a vasopressor.

Most of all heart failure patients received diuretics, with 84.7% of patients with heart failure as a primary diagnosis receiving the treatment and 67.2% of patients with heart failure as a secondary diagnosis receiving diuretics. Also, 6.9% of the primary heart failure patients received inotropes and 4.3% of the secondary heart failure patients received inotropes.

"Patients receiving diuretics and vasodilatory agents tended to do better than patients who received vasopressors or inotropes," Ng says.

"One more interesting thing was that of all of the other drug classes, including diuretics and vasodilators and inotropes, the mortality was always higher with secondary heart failure patients than with primary heart failure patients," Ng says. "But with vasopressors, the actual mortality rates were lower in secondary heart failure patients than in primary heart failures."

The fact that patients with a secondary diagnosis of heart failure did better with vasopressors was a significant finding, he adds.

"Overall, the prognosis still was better in patients who didn't receive a vasopressor," Ng notes. "But in those who did get a vasopressor, if you looked at mortality rates for secondary versus primary heart failure patients, the secondary did better."

There isn't a clear-cut reason why this finding appeared, although it probably is related to what the vasopressors were used for, Ng says.

"In patients with sepsis, you have to use a vasopressor in order to maintain blood pressure and perfusion, and so that might help their outcomes in that setting," he explains. "But in a heart-failure setting, that's a last-line therapy because if you're just trying to maintain blood pressure in a heart failure patient then that's indicative of a very serious problem."

Reference

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Software Strategies

Implement strategies to improve dispensing safety

Steps could help small hospitals, as well

Most hospitals, large and small, have medication dispensing cabinets. But the question is: Are you using these devices to maximize their safety potential?

Nearly 83% of all U.S. hospitals, including more than 70% of hospitals with less than 50 beds, use automated dispensing cabinets (ADCs), according to a recent survey.¹

However, hospital pharmacists could help their health systems improve the way the cabinets are used and eliminate many of the common medication errors that occur with their use, says **Michelle M. Mandrack**, RN, BSN, director of consulting services at the Institute for Safe Medication Practices (ISMP) in Horsham, PA.

"ISMP held a summit around improving safety when using medication dispensing cabinets,"

Summary points

- ADC display screens could be changed to improve safety.
- Adding full patient names and additional identifier would be one strategy.
- Develop guidelines for when ADC system overrides can occur.

Mandrack says. "We brought users and vendors together to look at the core characteristics that would make the cabinets' use safer."

ISMP developed a 2008 "Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets," which can be found at www.ismp.org/Tools/guidelines/ADC_Guidelines_Final.pdf.

Some of these strategies may be more challenging for small and rural hospitals to implement given that they may not have pharmacy services 24/7, Mandrack adds.

In small and rural hospitals there may be a perceived need to store greater variety and quantity of medications in the automated dispensing cabinets to cover periods when pharmacy is not on-site, she adds.

"However, having large quantities of medications on the clinical units poses some risk," Mandrack says.

"In the event the nurse inadvertently makes a calculation error, if there is enough medication in the cabinet to prepare an overdose, then those errors may be more likely to reach the patient," she says.

Here are a couple of ways health care vendors and hospitals can improve dispensing cabinet safety, as outlined among the 12 core processes in the ISMP guidelines:

1. Design the display screen to improve safety.

In the ISMP 2008 guidelines, this change relates to the core process of "Identify information that should appear on the ADC screen."

The ADC screens sometimes list information in a way that can cause confusion, such as truncating patient names or using abbreviations.

For instance, when twins or triplets are born in

a nursery, there will be multiple listings for patients with the same last name and perhaps only a first name designation of "A" or "B." Or in some rural areas, there are common family names, so nurses could select the wrong patient on the screen if there are multiple choices of patients with the same or similar last names, Mandrack says.

The solution is to have the ADC screen display a complete patient name, ensuring there are a sufficient number of characters in the field, and to use a second identifier.²

The second identifier could be a medical record number or a date of birth, Mandrack says.

The guidelines also recommend that the screen show patient allergies and patient location.²

The medication information should be displayed by listing the medication's name, both generic and brand when appropriate, and including safety font enhancements like tallman lettering, along with the patient-specific dose and route of administration.²

"What may not be recognized initially is the difference between the patient's specific dose and what is provided in the cabinet," she adds. "For example, if I need to give 10 mg of a specific medication, the cabinet might not contain 10 mg tablets, so I may have to get out two 5 mg tablets."

So the next line on the screen should include any instructions for preparing the dose, such as "two times 5 mg tablets equals 10 mg."²

The screen also should display any special instructions regarding whether the medication should be taken with meals, and it should identify the specified ADC pocket for the medication.²

Having the instructions spelled out on the display will help prevent the kind of medication errors that occur when staff are distracted.

"Nurses get interrupted so often when they are administering medications, and the dispensing cabinets often are in the hallway where a patient's family or a doctor might stop to ask the nurse questions," Mandrack notes.

So a safer solution is to design the dispensing cabinet screens to identify the patient-specific dose and to provide instructions on how the

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nurse needs to administer that dose, she says.

Other best practices related to medication information on the display screen include providing the time the last dose was removed, active alerts such as when a medication is selected to which a patient has an allergy, and potential warnings for high-alert medications.²

2. Ensure ADC system override is only for emergency needs.

A hospital's pharmacy department typically validates physician prescription orders, making certain the dosages are within guidelines, the patient has no allergies to the ordered medication, and that there are no harmful drug-drug interactions.

"Once that process is done then the information is communicated to the automated dispensing cabinet and the drugs can be accessed by nurses," Mandrack says.

However, some medications may need to be obtained in an emergency before there is time for a pharmacist review of the orders. Also, some smaller hospitals do not have 24-hour pharmacy services, so the ISMP guidelines address establishing criteria for ADC system overrides.

The criteria recommended in the guidelines include ensuring medications available for override are unit-specific and removed only when there is emergent need.²

The guidelines also recommend pharmacies implement strategies to reduce the risk of error

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when an override is used, including the following:²

- limiting the quantity and number of available drug concentrations;
- minimizing use of multi-dose containers;
- using a process where the drug and dose are checked against the patient's allergies and weight;
- providing preparation instructions if the nurse is required to dilute or reconstitute medications;
- requiring an independent double-check with another health care provider when removing high-alert medications on override;
- developing staff competency assessment related to safe use of overrides;
- reviewing and approving all override policies through a pharmacy, medication safety, or other committee;
- routinely reviewing override reports to identify and address barriers to the pharmacist's review of medication.

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