Pharmacogenomics
Give your pharmacy an edge

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Avatrombopag for Thrombocytopenia in Adults
EDITORIAL MISSION: Drug Topics is the top-ranked pharmacy resource for community and health-system professionals. Since 1857, readers have turned to Drug Topics for coverage of issues and trends important to the practice of pharmacy, and for a forum in which they can share viewpoints and practical ideas for better pharmacy management and patient care.
Healthcare in the United States is facing serious problems when it comes to patient access, quality of care, and cost of care. Healthcare delivery continues to evolve toward a value-based system where quality and cost outcomes determine success or failure. As this evolution unfolds, the challenges of producing higher quality outcomes at lower costs are significant. But where there are big challenges, there are also big opportunities. For too long, healthcare has relied on incremental change methodologies to drive improved results. Systems or tools are changed, but the basic way organizations think does not change. The new tools or systems allow for improved outcomes, but only to a point.

To truly achieve the kinds of breakthrough results needed for U.S. healthcare, transformational change is required, which means changing the way organizations think. To quote the old maxim “If you always think what you’ve always thought, you will always do what you’ve always done, and you will always get what you’ve always got.”

A major opportunity for innovative thinking includes how pharmacy is positioned in the healthcare system. Pharmacy is a fragmented service with distinct demarcations between key practice areas, such as retail, hospital, and managed care. For too many organizations, pharmacy is viewed as an ancillary service and they tend to manage it more like a commodity than a unique clinical and business enterprise. Unfortunately, pharmacy as a profession has not done enough to change this view.

Consider the following:

1. The primary treatment modality for the majority of patients in the ambulatory setting is medication. In hospitals, virtually every patient receives at least one medication. From the perspective of quality, effectively optimizing medication management is a major opportunity to enhance outcomes. No profession is better trained or positioned to do this than pharmacy.

2. An aging population coupled with more insured patients via the Affordable Care Act has accelerated access and demand issues. At the same time, we are looking at future shortages of physicians. Using pharmacists practicing at the top of their license as the medication therapy experts on the healthcare team frees up physicians to see more patients and helps keep patients out of high cost limited sources of care like hospitals.

3. Medications are the fastest growing element of U.S. healthcare. They currently consume approximately 17% of healthcare dollars. By the end of 2019, prescription drug spending in the United States could top half a trillion dollars. The most effective way to address medication use is to ensure that the optimal therapeutic regimen is chosen and that patients adhere to it. Pharmacists are the best-trained individuals in healthcare to support and drive optimal medication use.

4. Medication errors are the number one source of medical error and account for approximately $21 billion annually in the United States. Using pharmacists to support patient education and accurate utilization of medications presents a significant opportunity to reduce medication errors with the associated reduction in cost and increase in quality.

Healthcare leaders need to change the way they think about pharmacy and better understand how pharmacy can materially contribute to solving the challenges of access, quality, and cost. Pharmacy needs to act as a unified entity, speak with one voice that represents all facets of pharmacy practice, and tell our story more effectively. The opportunities are significant, but it will take stronger influence and advocacy to change thinking and help us realize our full potential to contribute to the advancement of healthcare.
Cancer Drug Prices Skyrocket. . .

Spending on oncology drugs doubled from 2012 to 2017, reaching nearly $50 billion, according to a new report. Two-thirds of the pricing growth is attributed to drugs launched within the past five years, according to the IQVIA Institute for Human Data Science.

The research firm also found that the global cancer drug market will reach $200 billion by 2022, averaging 10% to 13% annual growth; lower growth than the U.S. market, which is expected to grow 12% to 15% annually by 2022.

All oncology drugs launched in the United States in 2017 carried list prices above $100,000 per year. However, while outpatient drugs often result in high costs for payers, the patient responsibility averages less than $500 per year for commercial plans. Patient costs for retail drugs are often reduced by extensive use of coupons, IQVIA found.

“Payers continue to be challenged as they seek value and fund access to the latest oncologic treatment options,” says Murray Aitken, IQVIA senior vice president and executive director of the institute. “The surge in innovation brings new dimensions of complexity, even as the availability of predictive biomarkers and diagnostic tests can help bring a more precise course of treatment to an individual patient.”

Meanwhile, more than 700 cancer drugs are in late-stage development, an increase of 60% compared to 10 years ago.

And So Do Medicare Drug Prices

Medicare recipients are paying more for brand name drugs than they used to, according to a recent HHS report.

While there was a 17% decline in the overall number of brand name drug prescriptions filled from 2011 to 2015, Medicare Part D recipients’ costs for branded drugs soared 40% from 2011 to 2015. They rose from $161 in 2011 to $225 in 2015, on average. “Increases in unit prices for brand-name drugs resulted in Medicare and its beneficiaries paying more for these drugs,” the report says, noting that rising Medicare payments for brand-name drugs “will continue to affect Part D and its beneficiaries for years to come.”

The most persistent problem for Medicare beneficiaries is the high cost of maintenance medications for common chronic conditions such as diabetes, according to the report. Total out-of-pocket costs for patients were highest for brand-name insulin, cholesterol drugs, and asthma inhalers, the Associated Press reported.

The affordability of maintenance medications “directly impacts Medicare beneficiaries and their ability to access the prescription drugs they need to stay healthy,” Ann Maxwell, assistant inspector general for evaluation and inspections at HHS, told the Associated Press. “This has an immediate direct impact on their quality of life and their health.”
Children’s Hospitals Commit to Prevent IV Errors

ARxIUM, a pharmacy automation provider, and the Emily Jerry Foundation, (EJF) are teaming up to prevent medication errors in young patients.

The tech company and EJF will form a consortium of children’s hospitals in North America that are committed to eliminating IV compounding errors by 2021. EJF is a nonprofit organization that focuses on increasing medication accuracy and raising awareness of preventable medical errors.

The objective of the program is to implement technologies that produce safe and accurate medications and improve internal processes and training for pharmacy staff. In addition, the partnership will support pediatric hospital executives and foundations in attracting and prioritizing investments toward safer IV compounding practices.

The group works with an impressive network of hospitals, clinicians, and others and is a strong advocate of implementing clinically-proven technologies to eliminate IV compounding errors. Therefore, EJF serves as the ideal partner to build a consortium of children’s hospitals in North America dedicated to error-free compounding.” Niels Erik Hansen, president and CEO of ARxIUM tells Drug Topics.

(For more on pediatric pharmacy, see the Special Report on page 23.)

Hospitals Integrate Pharmacists in Heart Attack Care

Ten U.S. hospitals are relying more on pharmacists to help lower risk-standardized mortality rates from heart attacks, according to a study.

While the study, published in the May American Journal of Health-System Pharmacy, did not track mortality outcomes, it did reveal the ways that hospital cultures changed to integrate pharmacists in patient care. “Inclusion of pharmacists strengthened relationships across disciplines and allowed pharmacists to become routinely embedded in broader quality efforts,” the authors wrote.

Researchers from the Yale School of Public Health found that several organizations added pharmacists to rounds as part of an interdisciplinary team for patients with acute myocardial infarction. “More commonly, pharmacists rounded separately to provide patients with education on medications,” they wrote.

Hospital quality-improvement coalitions formed to reduce acute myocardial infarction mortality benefit from the inclusion of pharmacists, the researchers concluded. “Empowerment of pharmacists to solve problems allows for local innovation in the implementation of evidence-based strategies, tailoring solutions to fit the hospital context,” they wrote.

Shingles Vaccine Confusion

There has been a recent spate of errors by pharmacists and other healthcare professionals because they are confusing the two vaccines for shingles, and using the wrong administration route or diluent.

Shingrix (zoster vaccine recombinant, adjuvanted, or RZV; GSK) is occasionally being confused with Zostavax (zoster vaccine live, or ZVL; Merck), according to the Institute for Safe Medication Practices (ISMP). Shingrix and Zostavax have different vaccination schedules, storage requirements, components/diluents, and routes of administration.

A table describing the key differences can be found at http://www.ismp.org/ext/25.

“In the past three months, we have received seven error reports involving these vaccines through our National Vaccine Errors Reporting Program,” writes ISMP in its June 2018, “ISMP Medication Safety Alert! Community/Ambulatory Care Edition.”

Shingrix is administered intramuscularly (IM), and Zostavax is administered subcutaneously. “Improper IM injection of vaccines could result in bursitis, tendonitis, or other shoulder injuries,” ISMP writes.

Two of the reported errors occurred in community pharmacies, four were at outpatient medical clinics, and one was at a military location.

Pharmacies should create a system to ensure that the Shingrix lyophilized component and adjuvant suspension vials are stored with one another to reduce the risk of using the diluent for another vaccine, ISMP says. The CDC recently updated the information about proper storage, administration, and handling of the two vaccines, along with strategies to prevent administration errors.

“The product components are not interchangeable. Both components of the Shingrix vaccine, its lyophilized gE antigen component, and its adjuvant suspension component, should be stored under refrigeration, before and after reconstitution,” ISMP writes. If the lyophilized component or its adjuvant suspension are improperly stored in a freezer, they must be discarded.

Storage requirements for Zostavax are different. The lyophilized vaccine (attenuated varicella-zoster virus) should be stored in a freezer, while the sterile water diluent supplied by the manufacturer can be stored in a refrigerator or at room temperature, according to ISMP.
Specialty Pharmacy Student Association Launches

Specialty pharmacy students have a new avenue for professional development and networking: a new student pharmacy association.

The National Association of Specialty Pharmacy (NASP) rolled out its Student Pharmacist Chapter Program—the Student Association of Specialty Pharmacy (SASP)—which will provide specialty pharmacy education, promote professional development, and offer networking opportunities for pharmacy students.

“With a rich pipeline, innovative programs, and a growing patient population, specialty pharmacy has become a burgeoning industry. It is essential that we prepare pharmacy students to take their place in this rewarding industry,” says Sheila Arquette, executive director of NASP.

Students involved in SASP will have the opportunity to participate in specialized workshops and educational sessions, as well as develop hands-on leadership skills. Members can participate in NASP committees as well as the organization’s annual meeting. They will also have exclusive access to the NASP Center for Specialty Pharmacy Education, among other benefits.

“NASP Education Committee members will be available to participating schools to provide input on specialty pharmacy curriculum, student chapter organization, potential career opportunities, residency and fellowship training, and certifications,” says Stephanie LaPointe, PharmD, co-chair of the NASP Student Education Committee.

Pharmacy School Enrollment, PharmD Degrees Decline

In 2017, the second largest number of doctor of pharmacy degrees were conferred in the history of pharmacy education. It was a slight decrease over the largest number, in 2016, according to the American Association of Colleges of Pharmacy (AACP).

However, student enrollment in pharmacy schools for Fall 2017 declined from 2016. The decrease is only slight and could be attributed to colleges that did not report their figures.

New information from AACP found that enrollments in all professional years decreased 0.8%, while the number of first professional year enrollments fell 0.7% compared to fall 2016.

But several institutions did not report their enrollment data, which could have an impact on the findings. Cecilia Plaza, PharmD, vice president for academic services with AACP, tells Drug Topics.

“While we continue to see increases in the number of pharmacy schools each year, we did have three institutions that did not report their PharmD degrees conferred this year. Had these schools reported their data, we could have easily seen an increase in degrees awarded over last year,” Plaza says.

Overall college enrollments have been declining nationally for the past several years, “and this trend may just be beginning to impact pharmacy as well,” Plaza says.

Meanwhile, the number of PharmDs, as a first professional degree awarded, dropped from 14,556 in 2016 to 14,502 in 2017, according to ACCP.

Christine Blank is a contributing editor.
Pharmacogenomics: Business and Clinical Advantages for You

Pharmacogenomics can help your patients and your bottom line.

Jill Sederstrom

Pharmacists have long been touted as the medication experts, but to maintain that title they will need to expand their knowledge of pharmacogenomics, and they need to do so quickly.

“We need them to take leadership and ownership in this space now rather than later because it’s harder to try to get something back than it is to start showing interest and potential early on,” says Amina Abubakar, PharmD, AAHIVP, owner of Rx Clinic Pharmacy in Charlotte, NC.

Each year, the field of pharmacogenomics, which is also known as pharmacogenetics and explores how genetics affect patient response to medications, evolves. FDA data show that more than 260 therapeutic agents now have information on how genes affect them in their drug labeling. That number continues to grow as new research emerges. Information obtained from pharmacogenomics can reveal how medication dosing might need to be altered for a patient, or how certain medications might lead to an adverse reaction.

“The science advances in the field are just making it more critical that pharmacists have a really strong understanding of how to blend this into their training,” says Kathleen Jaeger, senior vice president of Pharmacy Care and Patient Advocacy for the NACDS.

While the emerging field requires pharmacists to add to their knowledge base, it also presents an important opportunity to enhance their role as a member of the care team.

“In my opinion, they should be the people that own pharma-
Pharmacists who offer genetic testing point to several strategies to ensure the successful implementation of a pharmacogenomics program.

1. **Secure specialized training.**
   
   It’s essential to understand the complex science and the implications of the test results. Abubakar, for example, received additional education through the College of Pharmacy at the University of Florida.

   NACDS has partnered with the University of Pittsburgh School of Pharmacy to create a Test2Learn Community-Based Pharmacogenomics Certificate Program. The 20-hour program includes 12 hours of home study and eight hours of live training.

   “It’s going to cover the fundamentals of genetic testing, ethical issues, very specific disease state summaries, and clinical guidelines,” Jaeger says, adding that the course also includes patient counseling strategies and tips on how to work with physicians to become an integral member of the care team. It’s targeted to pharmacists who are already working in the field who want to enhance their knowledge about this growing area.

2. **Partner with physicians.**
   
   Some genetic tests require a prescription from a physician before they can be administered, but Abubakar says even if it isn’t a requirement, she recommends all pharmacists reach out to the patient’s physician before administering a test.

   She learned the value of this after screening her first patient four years ago. She hadn’t contacted the patient’s physician until she got back results indicating the patient was not a candidate for clopidogrel. When she sent the results to the physician she was surprised to get an angry phone call in return asking who she was and why she was ordering tests.

   Abubakar decided to meet with the physician in person and learned that he saw the test as opening himself up to a lawsuit. Since he had not ordered the test himself, it could have been possible that it got filed away, without ever being reviewed by the doctor and could later present a liability if the patient had later had a stroke.

   He also admitted that he didn’t know a lot about the field, so Abubakar decided to reach out to other physicians to find out their views on the emerging science.

   Her survey showed that primary care providers thought it was a valuable test if only they knew more or, if they had the time to even review it, because the tests were coming up with so many results that they didn’t prescribe.

   She decided to become the expert herself, enhancing her education, so that she could work closely with physicians to assess the test results. “I was able to bring studies and suddenly I was a go-to person,” she says. “Then they started referring patients to me.”

   Now, whenever a new patient comes in, Abubakar or one of her other pharmacists reaches out to the physician before the test is given to communicate that if they receive actionable results they will work with the physician to determine treatment implications.

   “Through that approach we’ve got nothing but yeses or the nurse would call and say, ‘Hey, the doctor has never heard of this can you tell us more?’” she says.

3. **Promote your services.**
   
   Pharmacists also have to educate physicians and the general public that the service exists and is offered at their pharmacy. Fruth advertised through television, radio, and newspapers, even offering a newscaster an opportunity to take the test and announce the results on live television. She also did a lot of speaking events at Rotary Clubs and women’s groups.

   “I really found that the market that was most receptive to the messaging was women over 35 because they are really making a lot of the healthcare choices,” she says, adding that often they are often directing the healthcare choices of children, spouses, and aging parents.

**THREE KEYS TO A SUCCESSFUL GENETIC TESTING PROGRAM**

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Cogenetics,” says Daniel Dowd, PharmD, vice president of medical affairs at Genomind, a personalized medicine platform that offers a genetic test to guide treatment for a range of psychiatric conditions. “It’s a relatively new field, and who better than pharmacists to optimize drug therapy?”

Community pharmacies, including chain and independents, have already begun offering point-of-care pharmacogenomic services, including taking buccal swabs and sending them to a lab for genetic testing, counseling patients on the results, and working with physicians to develop optimal care plans for individual patients.

Here’s more on how pharmacists are stepping into this field, and how their actions are benefiting patients—and their bottom line.

DNA and the Neighborhood Pharmacy

This spring, Albertsons announced a pilot program with Genomind to bring genetic testing and counseling to 21 of its Sav-On pharmacies in Boise, ID; five of its Jewel-Osco pharmacies in the Chicago area; and two Sav-On pharmacies at Acmes in the Philadelphia area.

The pharmacies will use the genetic test designed by Genomind to optimize treatment for patients who have had unsuccessful experiences with medication for depression, anxiety, obsessive-compulsive disorder, or other mental illnesses.

Genomind’s specialty in mental health dovetails with Albertsons’ focus on mental health in its company specialty care pharmacy.

“We are already seeing some of these patients in our stores to administer long-acting injectables and so we are able to coordinate that in with this,” says Kimberly Hecht, PharmD, who works in patient care and specialty services/ new service development for Albertsons. According to Hecht, patients can either request the screening on their own, be referred by a physician, or receive a recommendation from a pharmacist.

“It would be patients who maybe are newly diagnosed and they want to pay for the test before they try their first treatment so they don’t try and fail treatment,” Hecht says, adding that other good candidates for the test would be those who have already tried several treatments and haven’t been successful.

One of the goals of the pilot program is to gauge the interest patients and physicians have in the service, and assess whether pharmacists feel it’s an area where they can make a difference in improving medication use. “We’re hoping to see how this new tool helps us better serve patients and improves their outcomes more quickly as they face mental health challenges such as depression, anxiety and obsessive-compulsive disorder,” explains Hecht.

Hecht says they also plan to study whether the consultations pharmacists have with patients regarding the test results are more effective in person or over the phone. Expansion of this service will be determined based on patient and physician satisfaction and the ability of Albertsons Companies pharmacists to make medication interventions to improve patient outcomes. “Because of our expertise and experience in mental health with Specialty Care, we hope to prove this new service is a natural fit for our pharmacy staff helping patients who are dealing with mental health issues.”

Brian Hille, BSPharm, RPh, vice president of Patient, Specialty and Wellness Services for Albertsons, says the company will make the decision whether to expand the services to more stores after assessing what kind of uptake the program receives.

Albertsons may be just beginning their foray into personalized medicine, but Fruth Pharmacy, a regional chain serving West Virginia, Ohio, and Kentucky, has been offering genetic testing at all its 30 retail stores for more than a year. The pharmacy offers the pharmacogenetic program known as Rxight developed by MD Labs. The test uses DNA taken from a cheek swab to evaluate how an individual’s genetic profile may influence treatment decisions. According to the company’s website, the test covers more than 200 prescription drugs and the ability to administer common medications in the right dose at the right time.
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and over-the-counter medications.

Lynne Fruth, president of Fruth Pharmacy, says since they’ve begun offering the service they’ve seen a lot of interest in assessing mental health medications and screening children to find the best treatment option whether it’s for ADHD, depression, or other conditions.

The pharmacies have had good feedback from parents of school children who had struggled with finding the appropriate selection and dosing of ADD medications, Fruth says. Testing can help patients determine which specific medications to treat ADD or ADHD may be more effective in a given patient and which may not work as effectively due to an individual’s metabolism, she notes.

Pharmacogenomics can also be effective in selecting pain medications or deciding whether a patient should take clopidogrel, she adds.

The pharmacy has teamed with Marshall University in Huntington, WV, and MD Labs to address the opioid crisis and will be doing genetic testing on opioid-addicted pregnant mothers, new mothers, and babies to identify the appropriate dosages of buprenorphine for them. “We’re excited to be doing that,” Fruth says.

After the results from the test are received, patients have a personal medication review with a pharmacist who walks them through the results and explains any implications from the findings.

Revenue Perks

The clinical benefits of using pharmacogenomics are vast, but adopting a pharmacogenomics program can yield significant business advantages for a pharmacy.

As an independent owner, Abubakar has been committed to developing what she calls a “journey beyond dispensing” at her pharmacy, but she found that services such as medication therapy management weren’t helping her generate revenue.

Offering genetic screening has allowed her to establish herself as an expert in personalized medicine, and boost her pharmacy’s revenue. The lab she partners with bills the pharmacies a flat fee of $200 for the testing. Abubakar’s pharmacy then charges $395 for the service and uses it to enhance their medication therapy management program. She says some pharmacies charge as much as $500 for the testing and counseling services.

Fruth reports that her pharmacies charge $400 for the service. Several insurance companies and Medicare part D plans will pay for the service when testing is done for cardiology or behavioral health reasons, otherwise patients may take on the cost themselves. She says those who have paid have reported that the results and its implications for medication therapy choices have been well worth the cost.

Fruth says offering the genetic testing services also helps pharmacists solidify their role as a patient’s regular pharmacist because it gives the pharmacist an opportunity to get to know the patient during the counseling session. Pharmacists are able to demonstrate their knowledge during these sessions and communicate an individualized understanding of the patient.

“It’s really just makes that pharmacist stand out as really a part of that care team. So to me, that’s where the real opportunity is for independents and smaller operators,” she says.

Making Pharmacists the Experts

There’s also advocacy work that still needs to be done on a national scale, to establish the pharmacist’s role in pharmacogenomics.

Abubakar has spoken at the White House and to the FDA about her work in pharmacogenomics and the role she believes pharmacists can play, but she says there’s still a lack of knowledge in Washington that pharmacists have the skill set and capabilities to be a leader in pharmacogenomics.

“Not everyone has the same information about pharmacists,” Abubakar says. “Many asked me, ‘Are you sure pharmacists can do that?’”

Jill Sederstrom is a contributing editor.
Whether working in a hospital, specialty, or retail pharmacy, pharmacists will tell you special considerations are needed when dealing with children and infants. Pharmacists must contend with challenges like weight-based dosing calculations, metabolic differences, adverse reactions, and the use of off-label medications and compounds. Combine those concerns with the fact that many patients are too young to communicate about how medications are affecting them and you have a recipe for potential errors.

A study on pediatric medication safety in emergency departments, published in Pediatrics in March, notes the ED presents a high risk for medication errors including problems caused by a lack of standardized pediatric drug dosing and formulations, lack of clinical pharmacists, and weight-based dosing. For patients outside the hospital setting, medication errors can happen because of confusing product packaging or use of the wrong dosing tools.

“It’s definitely a challenge,” says Anita Siu, PharmD, BCPPS, of weight-based dosing issues. She is a clinical associate professor at the Ernest Mario School of Pharmacy, Rutgers University, and a clinical neonatal/pediatric pharmacotherapy specialist at Jersey Shore University Medical Center. “You’re not going to treat a neonate within the first days of life the same way as we treat an infant or give the same doses as a child. Whether it’s younger children or older children, there is a lot of weight variation,” she says.

Drugs can be metabolized at different rates between pediatric and adult populations and within pediatric age ranges. Younger children, who weigh less, may metabolize certain medications faster so they might need a dose three times a day rather than twice as for adults. Body water volume impacts medication distribution and pharmacodynamics effects it, too. “Young kids are basically bags or buckets of water,” says Siu. “Because they have a larger volume of distribution, based on weight, we may need to give them more medicine.”

This is often the case with neonates. For example, they may need more gentamicin than older patients, says Susan Warrington, PharmD, BCPPS, clinical pharmacy specialist at the Lehigh Valley Health Network in Allentown, PA.

Capturing and documenting patient weight accurately and converting pounds to kilograms is crucial because dos-
SIX WAYS TO HELP CAREGIVERS GIVE KIDS MEDICINE

Many parents and caregivers have stories about trying to give medicine to a squirming or defiant child or infant. Here’s how Finkenbinder and Siu say you can help:

1. Tell them when medicines are available as flavored formulations.
2. Let a caregiver know if a tablet can or can’t be crushed or dissolved into food or liquid. Tell them to give a child a small amount to drink or eat first and then the medicine so they get the full dose before finishing a bottle or meal.
3. Slightly older children may prefer to have their medicine crushed or dissolved into snow cone flavoring or given with chocolate syrup, if possible.
4. Tell caregivers to never use household spoons to measure medication. Medication syringes or droppers are the best dosing tools. Give one with the medication.
5. When giving eye drops to children, tell the caregiver to lay them down on a bed or couch. If they won’t open their eyes, place the drop on the inner part of the eye. Once the patient opens the eye, the medicine will get absorbed.
6. Ear drops should be warm before application. Roll ear drops in the hand to warm them up before applying.

You’re not going to treat a neonate within the first days of life the same way as we treat an infant or give the same doses as a child. Whether it’s younger children or older children, there is a lot of weight variation.”

ANITA SIU, PHARM.D
enteral tubes, Finkenbinder says. They also create gelatin capsules for oncology patients and educate them on how to encapsulate bad-tasting tablets, such as prednisone, to make them more tolerable.

Finkenbinder emphasized the need for standardization of concentrations for compounded pediatric liquids. He says Skywalk uses the same manufacturer for liquid compounds with narrow therapeutic windows, such as tacrolimus. Switching manufacturers of these medications can result in variations in blood levels, which could in extreme circumstances result in organ rejection. Skywalk is encouraging health systems to adopt programs like the Michigan Pediatric Safety Collaboration guidelines, an initiative to standardize compounded liquid concentrations for pediatric patients. ASHP has also created an initiative called Standardize 4 Safety to reduce errors associated with varying concentrations of compounded medications.

**Adverse Reactions**
Children need to be watched closely for adverse drug reactions. A British study found at least one in 500 children will experience adverse drug reactions each year; and one in ten for hospitalized youngsters. Siu says children may be more vulnerable to different adverse reactions than adults.

**Caregiver Errors**
Transitioning care and educating caregivers is a key role for all pharmacists. “Discharge can be overwhelming, particularly for the more chronically ill or complex pediatric patient,” says Warrington, adding that Lehigh Valley Health Network emphasizes creating a partnership with retail pharmacies and outpatient clinics.

Pharmacists may do all they can to ensure patients receive the appropriate medications, but caregivers can make errors. For Finkenbinder, education is a big part of ensuring caregivers understand how to administer medication appropriately. He uses demonstration bottles to show caregivers how to use syringe adapters to remove a dose from the bottle and how to properly measure the dose in milliliters.

Many pediatric patients need doses that require a medication patch be cut into smaller pieces, he says. If a patient needs portions of a patch, he demonstrates how to cut and properly apply the patch. He educates on the proper way to dissolve hazardous medications such as methotrexate to reduce exposure to parents or caregivers.

With education, “it’s important to go the extra mile and ask open-ended questions,” he says.
Customers have many options to fill their prescriptions. It’s more important than ever to leverage your pharmacy’s ability to meet and exceed expectations and strike the right customer experience (CX) balance. Two-thirds of the 15,000 respondents to PwC’s “Future of Customer Experience Survey 2017/18” felt that companies have lost touch with the human element of CX. They are even prepared to pay more for better CX, meaning exceptional value with minimum friction or stress, PwC reports.

You can up your CX game to bring in new customers and keep the ones you have.

1. Get Your Employees Onboard.
Consumers generate revenue, but employees drive the experience. You hired your staff with that in mind, but are you making the most of them?

Liz Tiefenthaler, president of Pharm Fresh, a marketing company, says well-trained staff is critical to improving customer loyalty. One pharmacy owner learned the hard way. “She had a really crabby pharmacist on staff, and before she realized it she’d lost 20% of her business in six months,” says Tiefenthaler. “Customers were leaving because they couldn’t stand this woman.”

Tiefenthaler recommends regularly scheduled sessions with staff to discuss operational issues, get feedback, and brainstorm ways to improve.

2. Perfect a Personal Touch.
“Building customer loyalty really goes back to our professional role and rapport, developing the ability to relate positively to patients,” says Stephen Giroux, RPh, owner of a pharmacy chain in western New York.

Giroux personalizes the Prescribe Wellness patient engagement system’s prerecorded birthday call by singing the greetings himself. The response has been great.

Pharmacists can enjoy the loyalty and repeat business they can develop with just a little creative and thoughtful effort, he says.

3. Tap into Digital Media.
Social media can be an effective marketing tool with the right audience. Leveraged properly, it can provide continuity of messaging and ongoing engagement with your customers.

Justin Wilson, PharmD, relies heavily on a social media presence to promote his seven pharmacies in Oklahoma. He outsources it to professionals to create and manage the social media accounts for his stores, with a mix of fun posts, educational, and informational posts, he explains. “Outsourcing helps us keep up consistency with our messaging, but also can alert us when patients have issues or questions through those platforms.”

NCPA’s Senior Director of Store Operations and Marketing Gabe Trahan says it’s not so much the media as it is the message. People choose a pharmacy, he says, “by how much you can convince them it’ll be a better experience in your store.”

4. Expand Clinical Services.
Vaccinations, medication therapy management (MTM), blood pressure monitoring, and similar services can help your patients get the best possible treatment and outcome at the lowest cost.

NCPA chairman of the board Brian Caswell, RPh, says that, at Wolkar Drugs in Baxter Springs, KS, he is a “repository” of his patients’ medical information. “When we do an MTM, we bring all of that to the table to try to make the proper decision on what medications we think they should be on. [It] allows us to connect to the doctor and make the right therapy management,” he notes.

Don’t forget to promote the clinical services you offer, says Katherine O’Neal, PharmD, MBA, and associate professor in the Department of Pharmacy at the University of Oklahoma. “If patients aren’t aware of it, they don’t know to ask for it,” she says.

Looking for more ideas to boost customer loyalty?
NCPA offers its members an Opportunity Toolkit that includes a template for a letter to new patients, conversation talking points, a sample letter to new prescribers, a sample radio script, sign suggestions, posters and more. Check it out at https://bit.ly/2K9Vu1a.
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“I love the way Liberty developed a workflow queue system so we can find where a prescription is in the process.”

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Pharmacists Improve Clinical Outcomes in Primary Care

Positive effect on therapeutic goals seen for diabetic patients

Clinical pharmacists who provide comprehensive medication management (CMM) services in primary care networks (PCNs) are helping diabetic patients meet therapeutic goals.

A study at UC Davis Health System PCN, which is made up of 13 patient-centered medical homes (PCMHs), revealed that adding pharmacists to these care settings helped achieve target A1c rates, and improved blood pressure and adherence rates among patients taking statins. The study was conducted between October 2014 and October 2015. It was published in the May 2018 edition of the Journal of Managed Care & Specialty Pharmacy.

Jarred Prudencio, PharmD, the lead author, says the goal of the study was to see if pharmacists in those settings can improve patient outcomes. Although a pharmacy presence is strong at UC Davis ambulatory clinics, that wasn’t the case in the PCN before the study.

“It’s hard to justify a pharmacist’s salary in a patient-centered medical home because we’re not able to bill it. We needed to prove that with a pilot project. We were able to fund two pharmacists where the outcomes were going to be good enough to justify expanding to the rest of the clinics,” he tells Drug Topics.

Prudencio, assistant professor of pharmacy practice at the University of Hawaii in Hilo, says that there was a lot of support for CMM in the PCMHs. “But there was nothing really comparing a good comparison group before and after adding a pharmacist. We thought that because of the way that our network was set up, we’d be able to have as close of a real control group as possible.”

How it Works
The pharmacists connect with patients through an outreach list or from referrals from primary care physicians. In a 40-minute care appointment with patients in the clinic, they conduct medication record reviews to optimize medications and assess adherence. They then conduct motivational interviewing, diet and exercise counseling, and implement their plan.

The pharmacists have a collaborative practice agreement that allows them to change medication regimens and order labs without discussing it with the physician. “From a unique perspective, pharmacists are able to drive home specific details and optimize medications,” Prudencio says. Having the time to communicate with patients, getting them to understand their condition, and why they’re being prescribed certain drugs, makes a big difference, he adds.

A Growing Trend
Prudencio says that although it’s still not widespread, pharmacists are playing a greater role in primary care settings. “We’re really pushing interprofessional education, so the physicians who are coming out of residencies are used to being trained alongside clinical pharmacists, they know that pharmacists are well trained.”

He predicts that as PCMHs move toward pay-for-performance reimbursement, more will use pharmacists to help satisfy value-based metrics.

Under a fee-for-service model, the only way to receive payment for pharmacist services is to bill under “incident to physician-billing codes,” Prudencio says, where reimbursement rates are very low and not enough to justify the salary of a pharmacist.

Anthony Vecchione is executive Editor of Drug Topics.

The study included 95 patients in the intervention group (who met with pharmacists in the clinics) and 132 patients in the usual care group (who did not). Data showed that patients in the intervention group had significantly higher rates of therapeutic goal attainment for the three endpoints (40% vs. 12%, P<0.001) and statistically higher improvements in A1c, blood pressure, and statin goal attainment.

“We were able to fund two pharmacists where the outcomes were going to be good enough to justify expanding to the rest of the clinics.” JARRED PRUDENCIO, PHARMD.
Telepharmacy’s growth has burgeoned in recent years, thanks to its ability to reduce overall healthcare costs and improve outcomes. And it shows no sign of slowing.

Use by chains such as CVS Health and Walgreens—along with hospitals and clinics for follow-up care—telepharmacy is becoming even more prevalent in rural areas.

For example, Hy-Vee, a regional supermarket chain based in West Des Moines, IA, purchased two telepharmacies in rural communities in Iowa late last year. The telepharmacies are staffed with certified pharmacy technicians—and a pharmacist is on staff 16 hours each month. Pharmacists can counsel patients at the telepharmacies using a tablet or telephone, according to Hy-Vee.

In a keynote address delivered in May at HLTH 2018 (a leading industry event for innovation in healthcare that brings together key stakeholders), Troyen A. Brennan, MD, chief medical officer at CVS Health, discussed the potential for the company to “create a new, unique chassis for population health management.” This could be done by complementing the traditional use of telephonic case management with digitally-gathered information and real medical intelligence, combined with in-person visits to Minute Clinics and CVS Pharmacies he says. Digitally gathered information would include data collected using devices such as connected glucometers.

“We are looking to narrow the distance between patients in their everyday lives and the caregiving facility by leveraging digital data and making healthcare accessible in convenient community locations.”  

TROYEN A. BRENNAN, MD

“Healthcare is transforming. New expectations on onsite staff have made it difficult to complete all of the clinical and operational expectations required,” Joe Calomo, PharmD, MBA, divisional vice president of telepharmacy for CPS, tells Drug Topics. “On top of this, there has been a shift towards ‘value-based care’, which continues to demand higher quality while compressing reimbursements and therefore a drive to reduce costs. Telepharmacy models can help achieve both of these outcomes.”

In a study conducted by CPS in 2015, the use of medication reconciliation and telepharmacy reduced hospital readmission rates for patients who suffered from heart failure, pneumonia, and acute myocardial infarction. The study, in cooperation with JFK Medical Center in Edison, NJ, found a 7% decline in 30-day readmission rates for Medicare patients who had suffered from heart attacks, and a nearly 5% drop in readmission rates for Medicare patients with congestive heart failure.

CPS has seen such an increasing demand for telepharmacy that it recently expanded that division. It relocated its National Telepharmacy Center from Memphis, TN, to a larger facility in Naperville, IL, and plans to hire around 60 additional pharmacists and 12 pharmacy techs over the next four years. This is double the staffing it has now that monitors 3 million medication events annually.
On January 1, 2018, CMS enacted significant cuts to the 340B Drug Pricing Program, which offers discounts on brand name drugs to help compensate eligible hospitals for treating a disproportionate amount of uninsured or underinsured patients. However, the cuts do not affect all hospitals or the pharmacies they may be contracted with, including retail pharmacies.

Hospitals which have already contracted with community pharmacies to fill their prescriptions will not be affected as all previously signed contracts are being honored. It is too soon to tell how in-hospital pharmacies will be affected since the planned redistribution of funds from the cuts may affect individual hospitals differently.

“For those hospitals subject to this payment cut, it is a cut of approximately 30% on the amount otherwise received for these drugs,” says Emily Cook, MSPH, JD, a partner at McDermott Will and Emery, a law firm that works with hospital associations on 340B programs.

Medicare now pays these hospitals average sales price (ASP) minus 22.5% for 340B program drugs, rather than the prior payment of ASP plus 6%. “It is a significant cut,” she tells Drug Topics. “What is interesting about the payment cuts, is that the revenue that was generated by payment reduction is being redistributed to all hospitals.”

EMILY COOK
MSPH, JD
DRUGTOPICS.COM
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What do the cuts to this program mean for you?

Cuts to 340B Could Affect Clinical Outcomes

result of this payment cut is zero.” The savings from this will be redistributed equally to all 340 B participating hospitals covered under the OPPS.

How much the redistribution money compensates for loss of revenue varies by hospital. The amount redistributed depends on what the participating hospitals’ patient and service mix looks like, says Cook. “Hospitals dispensing a large volume of drugs payable under OPPS to Medicare beneficiaries and purchased at 340B price, may see a decrease in payments,” says Cook, noting that some hospitals may have to consider cutting services. “Other hospitals that participate in the 340B program may see an increase in payments.”

Effect on Clinical Outcomes

Chris Hudson, who serves as a managing director and healthcare industry lead at the consultancy firm Dacarba LLC, says it’s too soon to tell whether the reimbursements will adequately compensate some hospitals. “Hospitals are faced with declining reimbursements and increasing costs, which is placing continued pressures on operational excellence and clinical outcomes.”

Lynne Antonio-Lonie, RPh, director of pharmacy services at Interfaith Medical Center in Brooklyn, says her hospital is minimally affected by the cuts. “Mostly it affects Medicare Part B drugs that are administered in a physician’s office that the hospitals will buy and bill. There used to be a margin of revenue for that and it’s gone.” Interfaith does not use many physician-administered drugs. It uses community retail pharmacies registered with the 340B program, which are not directly affected by the cuts.

“We have a very busy behavioral health clinic that administers long-acting drugs once a month,” says Antonio-Lonie. “It’s very expensive, $1,000 to $3,000 per injection.” The center outsourced prescriptions to community pharmacies registered them under the 340B umbrella which get the brand name drug rebate.

In 2017, a coalition of hospitals filed a lawsuit against HHS to stop the cuts from being enacted. The case was dismissed on jurisdictional grounds in December and an appeal is pending. Cook says.

Joan Vos MacDonald is a contributing editor.
The variety, fast-paced environment, and instant gratification of pharmacotherapy interventions was what originally drew me to the critical care pharmacy specialty. Patients admitted to the ICU are complex and present unique medication challenges, most of which are never covered in a classroom. Even if you understand the basic pharmacology of the medication, you need advanced knowledge of the pharmacokinetics and pharmacodynamics specific to the critically ill patient you are treating. These challenges, and the specific skillset required, create an excellent niche for the critical care pharmacist. The multidisciplinary approach to patient care in the ICU environment is promoted by physicians and hospital administrators and ultimately considered obligatory for optimizing ICU patient outcomes.

Research over the last two decades has demonstrated that incorporation of a critical care pharmacist reduces medication errors and adverse events, saves money, and improves patient outcomes. Critical care pharmacy services are recognized as fundamental by the Society of Critical Care Medicine, the American College of Clinical Pharmacy, and ASHP.

So where does board certification in critical care pharmacy fit in?

Does a patient in the ICU receive better care from a board-certified critical care pharmacist (BCCCP) who is one year out of a critical care residency or from a critical care pharmacist who has been practicing for more than 20 years and chooses not to become board certified? Likely not.

There is actually little information available correlating board certification with improved patient outcomes or cost within any healthcare discipline. However, even without data, governing bodies believe in the credentials. Some states already use board certification as a minimum qualification for collaborative practice agreements and prescribing authority.

Why Board Certification?

A training path for critical care pharmacists that includes a PGY1 residency and a PGY2 residency in critical care is already well established. Board certification provides an opportunity to recognize the culmination of learning and sets a minimum competency for practicing critical care pharmacists. As a specialty group, we should embrace and encourage certification of our newly trained colleagues. Those of us who have been practicing for many years should lead by example and become certified ourselves.

There are no set requirements for pharmacists who already have a well-established career in critical care. Board certification is optional for everyone at this point. A critical care pharmacist with five years of experience (and zero residencies completed) qualifies to sit for the board exam. They do not need to go back and complete a residency. They just need to take the boards if they want to become certified.

Board certification is required for critical care physicians, so it is a certification well understood and expected in most advanced healthcare environments. I foresee board certification in critical care pharmacy following a similar path.

Will you join the nearly 2,000 critical care pharmacists who have already become BCCCPs? I know that I will, after I finish my term on the Board of Pharmacy Specialties Critical Care Specialty Council and become eligible to sit for the exam. I would encourage everyone to embrace this opportunity for the profession and support the mission to ensure the safe and effective use of medications in critically ill patients.

Tyree H. Kiser, PharmD, FCCM, FCCP, BCPS, is associate professor in clinical pharmacy at the University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, and a critical care pharmacy specialist at the University of Colorado Hospital.
Nine New Drugs You Should Know About

**ILUMYA** (tildrakizumab-asmn, Sun Pharmaceuticals)
**Indications:** Treatment of adults with moderate-to-severe plaque psoriasis who are candidates for systemic therapy or phototherapy.
**Dosage:** 100 mg at weeks 0, 4, and every 12 weeks thereafter.

**TAVALISSE** (fostamatinib disodium hexahydrate, Rigel)
**Indications:** Treatment of thrombocytopenia in adult patients with chronic immune thrombocytopenia who have had insufficient response to previous treatment.
**Dosage:** 100 mg orally twice daily with or without food. After 4 weeks, increase to 150 mg twice daily, if needed, to achieve platelet count at least 50 x 10^9/L as necessary to reduce the risk of bleeding.

**CRYSVITA** (burosumab-tzwz, Ultragenyx Pharmaceutical)
**Indications:** Treatment of X-linked hypophosphatemia (XLH) in patients 1 year of age and older.
**Dosage:** Pediatric XLH: Starting dose regimen is 0.8 mg/kg of body weight rounded to the nearest 10 mg, administered every 2 weeks. Adult XLH: 1 mg/kg body weight rounded to the nearest 10 mg up to a maximum dose of 90 mg administered every 4 weeks.

**AKYNZEO** (fosnetupitant and palonosetron, Helsinn Therapeutics)
**Indications:** Akynzeo for injection is indicated in combination with dexamethasone in adults for prevention of acute and delayed nausea and vomiting associated with initial and repeat courses of highly emetogenic cancer chemotherapy.
**Dosage:** One vial of Akynzeo for injection; reconstituted in 50 ml of 5% dextrose injection, USP, or 0.9% sodium chloride injection, USP, and administered as 30-minute infusion starting approximately 30 minutes prior to the start of chemotherapy.

**LOCEMYRA** (lofexidine, US WorldMeds)
**Indications:** Mitigation of opioid withdrawal symptoms to facilitate abrupt opioid discontinuation in adults.
**Dosage:** Three 0.18 mg tablets taken orally four times daily at 5- to 6-hour intervals.

**LOKELMA** (sodium zirconium cyclosilicate, AstraZeneca)
**Indications:** Treatment of hyperkalemia in adults.
**Dosage:** 10 g administered three times a day for up to 48 hours.

**PALYNZIQ** (pegvaliase-pqpz, BioMarin)
**Indications:** Reduction of blood phenylalanine concentrations in adult patients with phenylketonuria who have uncontrolled blood concentrations greater than 600 micromol/L on existing management.
**Dosage:** 2.5 mg subcutaneously once weekly for 4 weeks.

**OLUMIANT** (baricitinib, Eli Lilly and Incyte Corporation)
**Indications:** Treatment of adult patients with moderate to severe active rheumatoid arthritis who have had an inadequate response to one or more TNF antagonist therapies.
**Dosage:** 2 mg orally once daily.

Nicholas Hamm is associate editor of Drug Topics.
Avatrombopag (Doptelet, Dova) received FDA approval in May for treatment of thrombocytopenia in adults with chronic liver disease who are scheduled to undergo medical or dental procedures. Avatrombopag is a small molecule thrombopoietin (TPO) receptor agonist that increases production of platelets by stimulating development of megakaryocytes from progenitor cells in bone marrow. Megakaryocytes produce platelets. Avatrombopag noncompetitively binds the TPO receptor resulting in an additive effect on platelet production.

**Efficacy**

Avatrombopag was approved based on results from two multicenter trials, ADAPT-1 and ADAPT-2. The trials include 435 participants. In both trials, participants were assigned to a cohort based on their baseline platelet count. Participants with a platelet count less than 40 x10^9/L were assigned to the low-baseline platelet count cohort. Participants with platelet counts between 40 and 50 x10^9/L were assigned to the high-baseline platelet count cohort. Within the cohorts, participants were randomized to receive avatrombopag or placebo for five days. Participants in the low-baseline cohort received 40 mg daily. Participants in the high-baseline cohort received 60 mg daily. Five to eight days after the last dose of treatment, participants could undergo their scheduled procedure.

The percent of patients undergoing procedures associated with low, moderate, and high bleeding risk are 60.8%, 17.2%, and 22.1%, respectively. Patients scheduled for a neurosurgical intervention, thoracotomy, organ resection, or laparotomy were excluded from studies. The primary efficacy endpoint of both studies is the proportion of responders; patients not requiring a platelet transfusion or rescue procedure as a result of bleeding within a week of the scheduled procedure. In both trials, more participants of both cohorts who received avatrombopag showed a greater mean change in platelet counts and achieved the target platelet counts.

**Safety**

In both trials, more participants in both cohorts who received avatrombopag showed a greater mean change in platelet counts and achieved target platelet counts.

The most common adverse reactions reported in greater than 3% of total participants from both cohorts include fever (10%), abdominal pain (7%), nausea (7%), headache (6%), fatigue (4%), and peripheral edema (3%). Patients must be monitored for changes to platelet counts and thromboembolic events. TPO receptor agonists have been associated with thrombotic events in patients with chronic liver disease. Avatrombopag should not be used for maintenance of increased platelet levels in patients with chronic liver disease.

**Dosage**

Avatrombopag is approved for use starting 10 to 13 days before a scheduled procedure and daily for 5 consecutive days. It is available as 20-mg tablets. The recommended daily dose for use is related to the patient’s platelet count prior to the procedure: 60 mg (three tablets) daily for patients with less than 40 x10^9/L and 40 mg (two tablets) daily for patients with platelet count between 40 and 50 x10^9/L.
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Pharmacogenomics: Every Patient is Unique

Although the United States of America is frequently referred to as “the great melting pot,” I prefer to look at our citizens in a different light. Rather than a giant homogenous mixture, as a melting pot captures, I think of our culture as a stained-glass window. Each of us is indeed a colorful and unique creation welded together to make a beautiful picture known as society. Bound by rules and economic principals, we as unique pieces contribute to the big picture.

Pharmacogenomics, [see cover story pg. 18] the hot topic in community pharmacy practice today, illustrates very well that our individual genetic makeup is what drives our ability to derive benefit or harm from specific drugs.

Because of the intermarrying between ethnic groups, the longer we live in America the closer we are to approaching the melting pot analogy. A few generations back, a lot of genetic tendencies could be ascertained by simply seeing someone’s last name. Today however, last names provide little information about the patient’s ethnic group. My grandson, Luke Garofoli, has twice as much “German blood” as he has “Italian blood.” Even though his last name is tied to a vineyard and winery in the Marche region of Italy, his genetic makeup is closer to the Biergartens of Munich!

Currently, we are blessed to have a student pharmacist, Xinyan Ye, from the University of Pittsburgh School of Pharmacy, doing our rotation. She is a charming and vibrant young woman who was born in Beijing and whose family moved to America when she was two years old. Knowing that information, I’m sure if she was prescribed carbamazepine, we would, as advised by the carbamazepine package insert, recommend HLA-B*1502 genetic testing to minimize the risk of Stevens-Johnson syndrome. Also, we’d never start her father on any dose of rosuvastatin higher than 5 mg.

Depending on where you practice, those patients standing on the other side of your counter might be unique in their pharmacogenetic profiles.

“Depending on where you practice, those patients standing on the other side of your counter might be unique in their pharmacogenetic profiles.”

by the OB/GYN department at her clinic in State College, PA. They had a patient who was of Iranian descent, was pregnant, had glucose-6-phosphate dehydrogenase deficiency, and was allergic to penicillin. This rules out virtually every common antibiotic class, but fortunately for the patient, my wife was able to recommend fosfomycin (Monurol) as the only appropriate choice.

Although I frequently refer to myself as being one of those “vanilla white” patients, I was amazed when my genetic profile showed that I am a weak metabolizer of CYP-450-2C19. If I were to get stented and need antiplatelet therapy, that very common drug we buy in thousands called clopidogrel (Plavix) might not give me the benefits I need, and potentially could cause a stroke.

Pharmacogenomics is indeed one interesting facet of community pharmacy practice, and for a few specific drugs, it might be the difference between desired or unfortunate outcomes. Every patient is unique, and their piece of stained glass adds to the beauty of our big picture. There are more colors of stained glass standing in our pharmacies than we might have envisioned.

My words of wisdom to our newest clinicians are that those case studies you see in pharmacy school are frequently real people standing on the other side of your counter. You need to know your stuff!

Read more about how pharmacogenomics is helping community pharmacies gain an edge in the Cover Story on page 18.
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