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The future is now

Do you remember professional football in the 1970s with Washington Redskins coach George Allen? Upon taking over as head coach of the Redskins in 1971, coach Allen declared “the future is now” and proceeded to trade future draft choices and promising young players for proven veterans. The result? Coach Allen quickly turned the Redskins into a championship team.

Providing cognitive services

It is our belief that the same kind of attitude should be adopted by pharmacists in all practice settings. That being, the future of pharmacy as a provider of life-saving cognitive services is not in the future, but can be practiced now.

Healthcare costs in America are estimated at $2.5 trillion, approaching 20% of GDP, and are expected to rise to over $4 trillion within the next six years. Perhaps the future will show that one of the most positive effects of the Affordable Care Act is raising awareness that the health of our nation is a serious issue, which must be addressed in more effective ways. Lack of medication adherence is a $290 billion issue; hospital readmissions within 30 days are another $40 billion problem. Both issues are further compounded by a lack of screenings, immunizations, poor management of chronic diseases, and high failure rates for wellness programs, such as smoking cessation and nutrition counseling. These are all areas where pharmacists are making a difference.

Sadly, an examination of the causes for poor performance within these areas shows the reasons have remained virtually the same for over 20 years. A June 1990 study by the Office of the Inspector General and the Department of Health and Human Services, “Medication Regimen: Causes of Noncompliance,” found that 55% of the elderly failed to comply with their prescribed therapy. Today’s studies show compliance rates virtually unchanged.

As I have been engaged with practicing pharmacists, I am excited to see many of them are finding ways to provide patient care that improves outcomes and their bottom line. One pharmacist in Tennessee, who was interviewed by a trusted industry friend, has implemented an effective medication therapy management (MTM) program without regard to third-party payment. When questioned as to how he justified the time spent on providing such care, he showed my friend the bag of medications one patient brought in for a session. It contained more than 20 prescription vials; several of them from competing pharmacies. The owner stated, “By providing a total drug review I was able to transfer medications filled at two other locations to mine.” The end result for this innovative pharmacist was more prescriptions filled, more dollars to the bottom line, and a healthier patient who tells her friends to take their prescriptions to his pharmacy.

Working with technology partners

We must take advantage of the current state of heightened awareness brought about by the national debate over health care. Pharmacists can act now by working with their technology partners to leverage existing automated voice, SMS, e-mail, social media, and push technologies to improve outcomes. By combining technology with proven human relationship improvement techniques and with the carefully managed and pharmacist-instigated collaboration among physicians, hospital discharge planners, and other concerned stakeholders, pharmacists can provide better health care, lower healthcare costs, and achieve the profitability they need to survive. How can I say this – because I see it happening in pharmacies all across the country – today!

Current technology can be used in a well-planned, consistent, socially acceptable, and HIPAA-compliant manner in the patient’s channel of choice, the preferred language, and with varying levels of intensity to support the cognitive, motivational, and educational challenges of the individual patient. Don’t wait for some new program, technology, or third-party payment plan to start delivering enhanced patient care. Everything you need is already in place.

Al Babbington is CEO and founder of Prescribe Wellness, Inc., a California-based firm that specializes in helping identify patients who will benefit from extra support and then delivering messages to patients that result in improved relationships and better outcomes.
Letters

More time is the answer

"Re: “Feeling like a pharmacist” [View from the Zoo, October]:

Again you knocked it out of the park. A quick answer is not the way to go. One needs time to research some questions based on the patient’s medical conditions, without having “work” backing up, the phone ringing, etc. It is not always a quick answer when someone says they can’t afford what was prescribed, and wants to know what medicine THEY should tell their doctor to prescribe. I would really love to be able to have access to their lab data and other aspects of their medical history rather than just give an off-the-cuff answer that may not be appropriate for them as an individual."

D. Lutz, P.D.
Baltimore, MD

No to cyberconsulting

Usually I’m in full agreement with David Stanley’s well-thought out articles, but I must differ with the direction he took in his recent editorial, “Feeling like a real pharmacist” [View from the Zoo, October]. Having left his previous employer, he’s found recent satisfaction in providing online consultations to patients and professionals in cyberspace. It’s true that there’s a lot of potential for a “cyberconsultant” to “do good,” but the reality is, as he even identifies, there’s no revenue to be had and one can quickly run afoul of different states’ (or nations’) pharmacy practice acts or even worse, engaging in activities not covered by one’s professional liability insurance.

Early on in my internet experience I recognized that, while certainly altruistic and rewarding, cyberpatients present both legal and ethical concerns, which still haven’t been addressed. I’ve recommended to pharmacy students who’ve had their rotations with me to NEVER engage in cyberconsulting unless they are 100% certain who it is they are communicating with (ie. video or Skype). There’s just too many ways to be duped as well as exposed to practicing without proper licensure to make this activity worthwhile. I’m definitely looking forward to David’s future musings when he re-enters “the day-to-day reality” that we all know, and, well, live with.

Richard Molitor, RPh
Kirkland, WA

Be careful with drug purchases

Congratulations to Geoffrey Kaiser on his article, “Risky business: Rx drugs obtained in the secondary market” [October issue]. The article was insightful because independent pharmacies are squeezed with how we purchase our drugs. Our return is very small and sometimes more often than we like to admit, we lose money on our reimbursements from our PBMs. We need to be extremely careful from where we purchase our drugs.

Brian Snyder, RPh
Philadelphia, Penn.

More visibility to the public needed

As usual your column is right to the point [“Late at night and over the line,” September]. I feel the biggest issue facing pharmacy today is the lack of knowledge and appreciation for our profession by the general public. Elsewhere in the issue is raised the problem of how the PBMs and major chains are slowly destroying what remains of our profession. I found the point raised about how doctors would never stoop to having general merchandise or food products in their offices to be especially appropriate to your column. Somehow we as pharmacists need to reverse the trend and increase our visibility to the public or perish.

John Abel, RPh
Waltham, N.Y.

We want to hear from you

Printed and e-mailed letters should be brief and include the writer’s name, address, daytime phone number, and date of the issue you are referencing: Editor, Drug Topics, 24950 Country Club Blvd., Suite 200, North Olmsted, OH 44070-5351. Email address: drugtopics@advanstar.com. Letters may be edited for length, style, content, and clarity at our discretion.
Continue the push for provider status

We read with keen interest “Provider status not the only path to payment for clinical services,” by Thomas E. Menighan (Dispensed as Written, May 2012) and are in full agreement with many of his statements. As student pharmacists, we recently participated in an elective course that pushed us to explore a health policy issue affecting pharmacy practice. The purpose of our project was to research the scientific evidence supporting expanded pharmacist services and to interview current pharmacists to learn more about their struggles with the lack of provider status under current legislation.

During our research, we evaluated the “2011 U.S. Public Health Service Report to the Surgeon General by the Office of the Chief Pharmacist.” It clearly outlines the arguments for amending the Social Security Act (SSA). Results from three meta-analyses, a Cochrane review, and a systematic review of 298 studies show that pharmacist-delivered patient care services have positive outcomes on disease management, quality and access to care, cost containment, patient safety, and overall health system efficiency.

It is important to note, however, that many of the studies cited in the USPHS Report were conducted over 10 years ago. For this reason, opponents of amending the SSA have argued that the current scientific literature and economic analyses might not be strong enough to convince third-party payers of significant cost savings through compensation of pharmacists as providers. The pharmacy profession needs to continue to collect research that is both current and of high quality to add value to the argument to amend the SSA.

For example, the Virtual Accountable Care Network recently received a 2012 Centers for Medicare & Medicaid Services (CMS) Innovation Award and funding to create specialized support centers for transition of care. These centers will be staffed by nurse care managers and pharmacists and will offer more integrated care for areas serviced by seven hospitals in Pennsylvania. Collecting data from projects like this can help in the push for provider status.

While the landscape is indeed moving away from the fee-for-service reimbursement model, we feel that, beyond reimbursement issues, including pharmacists as providers in the SSA and other key CMS documents finally give pharmacists much-deserved recognition for their contributions to improving the healthcare system. The education and training of pharmacists today makes them qualified to complement diagnosticians and help provide comprehensive patient care.

Breaking away from stereotypes

Yet, few other professionals (i.e., physicians, nurses, etc.) know what the pharmacy curriculum includes, and stereotypes are pervasive. Pharmacists, as part of the healthcare team, can help address the widening patient care gap caused by the growth of an aging population, increased demand on health services, emphasis on prevention, and shortage of primary care physicians. However, the emphasis on current stereotypes prevents others from valuing our work and collaborating with us.

We would also like to remind pharmacists of the strategies employed by nurse practitioners in their successful movement for provider status over 15 years ago. We need to: command recognition among healthcare professionals, conclusively demonstrate the value of pharmacists, establish minimum educational standards, use professional organizations to gain a stronger unified voice, and show a commitment to this cause.

In California, we propose changes to local policymakers that support compensation of pharmacists as providers through Medi-Cal, and we can continue to work with CMS to amend regulations that allow reimbursement of pharmacists as providers.

Lack of provider status creates barriers to the use of pharmacists. While practicing pharmacists recognize the challenges in reimbursement and restriction of their services arising from this lack of provider status, many student pharmacists, other healthcare professionals, and the general public are not yet aware. We recommend that preceptors and professors encourage students to engage in more legislative projects to raise their awareness.

Recognition of pharmacists as healthcare providers through legislation and policy will create the support needed to sustain and promote pharmacist services that optimize patient care and outcomes and reduce healthcare costs. It is more important than ever that all student and practicing healthcare professionals stay apprised of policy issues.
IN MY VIEW  Nick Smock, PharmD, MBA

Affordable Care Act opens door to charge professional fees

Currently pharmacists are reimbursed through the selling of a product, the medication. This puts pharmacists in an awkward position to sell more and more medicine to be compensated for their services.

The Affordable Care Act (ACA) recognizes the value of pharmacists to provide cognitive services as part of patients’ overall health care. Pharmacists should be able to charge a reasonable amount for cognitive services based on their education, experience, time, and overhead (including liability), and a return on their capital (ROC). Initially, pharmacists should invest enough time to establish a patient profile, similar to a psychologist who sees a new patient. Pharmacists should then be able to be compensated for follow-up visits to obtain healthy outcomes.

Pharmacists may do an initial consult and charge, say $60 to $100 for a one-hour visit. This consult may include talking with the prescribing physician, psychologist, dentist, nurse, or insurance company. It may also include discontinuing a prescription medication for a number of reasons, saving the patient $600 a year. So was it worth $100 to save $600, not to mention minimizing the patients’ adverse reactions?

Originally, pharmacists manufactured individual pills from bulk medicine compounding products. There was enough profit to cover the ingredient and manufacturing costs, professional fee, overhead, and ROC.

An evolving industry
As the industry evolved with pharmaceutical companies becoming the manufacturers, pharmacists became dispensers and lived on the margin between the purchase price and the reimbursement price, which has greatly diminished due to pharmacy benefit managers (PBMs). These intermediaries make more profit on each prescription than the pharmacist provider.

The Affordable Care Act recognizes the value of pharmacists to provide cognitive services as part of patients’ overall health care.

Today, the margins have dropped considerably between the pharmacists’ product costs versus reimbursements. It’s almost to the point of the pharmacist selling medication below the purchase price from their wholesaler. PBMs are telling the pharmacist to make up their profits by selling sundry items such as cosmetics, toothpaste, liquor, and cigarettes.

Fill primary care provider gap
Patient outcomes have not necessarily improved under the current model since it is based on selling a product (e.g. prescription) and not geared toward regular and consistent patient education. The United States projects to have a shortage of primary healthcare providers (e.g. physicians) due to the low reimbursement for family practice physicians. Most graduating physicians today specialize in various fields because of higher reimbursement from third-party payers. Pharmacists can fill this gap of primary care providers based on their experience and clinical knowledge, providing positive health outcomes.

A new role for pharmacists
FDA is considering a proposal to allow pharmacists to recommend various types of medication for cholesterol, high blood pressure, etc. without a prescription. In this scenario the patient comes to the pharmacist after the physician diagnoses his or her condition. The pharmacist recommends the medication, dosage, and strength. The pharmacist would titrate and monitor doses and change or discount the patients’ medication without having to constantly check with the patient’s physician.

The ACA provides community pharmacists the opportunity to provide additional care to their patients while at the same time increase profit margins. It’s time to charge professional fees.

Nick Smock is CEO of PBA Health (www.pbahealth.com), a purchasing and pharmacy services organization (PSO) that helps more than 2,400 community pharmacies buy, operate, and sell more effectively.
WHAT YOU NEED TO KNOW

PRESCRIBED FOR CHILDREN 6 MONTHS OF AGE AND OLDER

• No Contraindications
• Sklice Lotion should be used in the context of an overall lice management program

IMPORTANT SAFETY INFORMATION FOR SKLICE LOTION

• The most common adverse reactions (incidence <1%) were conjunctivitis, ocular hyperemia, eye irritation, dandruff, dry skin, and skin burning sensation

PROVEN EFFECTIVE IN TWO CLINICAL TRIALS

• Patients received a single 10-minute treatment and were instructed not to nit comb
• 14 days after treatment, no live lice were observed in 76.1% (54/71) and 71.4% (50/70) of patients

10-MINUTE TREATMENT

• No nit combing required
  — However, a fine-tooth comb or special nit comb may be used to remove dead lice and nits
• To prevent accidental ingestion, adult supervision is required for pediatric application. Avoid contact with eyes.


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Order a tube of Sklice Lotion for your pharmacy today.
INDICATION
Sklice Lotion is a pediculicide indicated for the topical treatment of head lice infestations in patients 6 months of age and older.

ADJUNCTIVE MEASURES
Sklice Lotion should be used in the context of an overall lice management program:

• Wash (in hot water) or dry-clean all recently worn clothing, hats, used bedding and towels
• Wash personal care items such as combs, brushes and hair clips in hot water

A fine-tooth comb or special nit comb may be used to remove dead lice and nits.

IMPORTANT SAFETY INFORMATION FOR SKLICE LOTION
In order to prevent accidental ingestion, Sklice Lotion should only be administered to pediatric patients under the direct supervision of an adult.

The most common adverse reactions (incidence <1%) were conjunctivitis, ocular hyperemia, eye irritation, dandruff, dry skin, and skin burning sensation.

Please see brief summary of full prescribing information on the following page.

For more information, please visit www.Sklice.com/HCP.

NDC: 49281-183-71

a Two randomized, double-blind, vehicle-controlled trials in patients 6 months of age and older with head lice infestations. The primary endpoint was assessed as the proportion of patients who were free of live lice at day 2 and through day 8 to the final evaluation 14 (+2) days following a single application.2

Sklice Lotion is manufactured by DPT Laboratories Ltd and distributed by Sanofi Pasteur Inc.

SKLICE® (ivermectin) Lotion, 0.5% for topical use

Rx Only

Brief Summary of Prescribing Information

1 INDICATIONS AND USAGE

1.1 Indication

SKLICE® Lotion is indicated for the topical treatment of head lice infestations in patients 6 months of age and older.

1.2 Adjunctive Measures

SKLICE Lotion should be used in the context of an overall lice management program:

- Wash (in hot water) or dry-clean all recently worn clothing, hats, used bedding and towels.
- Wash personal care items such as combs, brushes and hair clips in hot water.
- A fine-tooth comb or special nit comb may be used to remove dead lice and nits.

2 DOSAGE AND ADMINISTRATION

For topical use only. SKLICE Lotion is not for oral, ophthalmic, or intravaginal use.

Apply SKLICE Lotion to dry hair in an amount sufficient (up to 1 tube) to thoroughly coat the hair and scalp. Leave SKLICE Lotion on the hair and scalp for 10 minutes, and then rinse off with water. The tube is intended for single use; discard any unused portion.

Avoid contact with eyes.

4 CONTRAINDICATIONS

None.

5 WARNINGS AND PRECAUTIONS

5.1 Ingestion in Pediatric Patients

In order to prevent ingestion, SKLICE Lotion should only be administered to pediatric patients under the direct supervision of an adult.

6 ADVERSE REACTIONS

6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in clinical practice.

The data described below reflect exposure to a single 10 minute treatment of SKLICE Lotion in 379 patients, ages 6 months and older, in placebo-controlled trials. Of these subjects, 47 subjects were age 6 months to 4 years, 179 subjects were age 4 to 12 years, 56 subjects were age 12 to 18 years and 97 subjects were age 16 or older. Adverse reactions, reported in less than 1% of subjects treated with SKLICE Lotion, include conjunctivitis, ocular hyperemia, eye irritation, dandruff, dry skin, and skin burning sensation.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Pregnancy Category C

There are no adequate and well-controlled studies with SKLICE Lotion in pregnant women. SKLICE Lotion should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

No comparisions of animal exposure with human exposure are provided due to the low systemic exposure noted in the clinical pharmacokinetic study [see Clinical Pharmacology (12.3) in the full prescribing information].

Human Data

There are published reports of oral ivermectin use during human pregnancy. In an open label study, 397 women in their second trimester of pregnancy were treated with ivermectin tablets and albendazole at the labeled dose rate for soil-transmitted helminths and compared with a pregnant, non-treated population. No differences in pregnancy outcomes were observed between treated and untreated populations.

Animal Data

Systemic embryofetal development studies were conducted in mice, rats and rabbits. Oral doses of 0.1, 0.2, 0.4, 0.8, and 1.6 mg/kg/day ivermectin were administered during the period of organogenesis (gestational days 6–15) to pregnant female mice. Maternal death occurred at 0.4 mg/kg/day and above. Cleft palate occurred in the fetuses from the 0.4, 0.8, and 1.6 mg/kg/day groups. Exencephaly was seen in the fetuses from the 0.8 mg/kg group. Oral doses of 2.5, 5, and 10 mg/kg/day ivermectin were administered during the period of organogenesis (gestational days 6–17) to pregnant female rats. Maternal death and pre-implantation loss occurred at 10 mg/kg/day. Cleft palate and wavy ribs were seen in fetuses from the 10 mg/kg/day group. Oral doses of 1.3, 3, and 6 mg/kg/day ivermectin were administered during the period of organogenesis (gestational days 6–18) to pregnant female rabbits. Maternal toxicity and abortion occurred at 6 mg/kg/day. Cleft palate and clubbed forepaws occurred in the fetuses from the 3 and 6 mg/kg groups. These teratogenic effects were found only at or near doses that were maternally toxic to the pregnant female. Therefore, ivermectin does not appear to be selectively fetotoxic to the developing fetus.

8.3 Nursing Mothers

Following oral administration, ivermectin is excreted in human milk in low concentrations. This has not been evaluated following topical administration. Caution should be exercised when SKLICE Lotion is administered to a nursing woman.

8.4 Pediatric Use

The safety and effectiveness of SKLICE Lotion have been established for pediatric patients 6 months of age and older [see Clinical Pharmacology (12.3) in the full prescribing information and Clinical Studies (14) in the full prescribing information].

The safety of SKLICE Lotion has not been established in pediatric patients below the age of 6 months. SKLICE Lotion is not recommended in pediatric patients under 6 months of age because of the potential increased systemic absorption due to a high ratio of skin surface area to body mass and the potential for an immature skin barrier and risk of ivermectin toxicity.

8.5 Geriatric Use

Clinical studies of SKLICE Lotion did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients.

10 OVERDOSE

In accidental or significant exposure to unknown quantities of veterinary formulations of ivermectin in humans, either by ingestion, inhalation, injection, or exposure to body surfaces, the following adverse effects have been reported most frequently: rash, edema, headache, dizziness, asthenia, nausea, vomiting, and diarrhea. Other adverse effects that have been reported include: seizure, ataxia, dyspnea, abdominal pain, paresthesia, urticaria, and contact dermatitis.

In case of accidental poisoning, supportive therapy, if indicated, should include parenteral fluids and electrolytes, respiratory support (oxygen and mechanical ventilation if necessary), and pressor agents if clinically significant hypotension is present. Induction of emesis and/or gastric lavage as soon as possible, followed by purgatives and other routine anti-poison measures, may be indicated if needed to prevent absorption of ingested material.

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IVE-BPLR-SA-FEB12 Revised: February 2012
Recently I attended my 40-year high school class reunion. Reunions can be odd things, getting together with old friends you haven’t seen in a while, but this one wasn’t. It had been 20 years since our last reunion and I thought that this one might be the last as the previous get-together had been poorly attended. I was pleasantly surprised this year.

It was a casual event and everyone got along well. We played a Jeopardy-like game about our high school days, told lots of stories, and laughed and reminisced. From the Facebook posts the next day, everyone had a really good time, and can’t wait until our next reunion.

As you look back, you tend to get sappy about the good times and forget the bad. A reunion is a good reminder that you never were as good as you thought you were, but no one else was either. Maybe a reunion is best described as an evening of grace.

I’m curious about what my pharmacy career reunion would be like. I’ve worn a lot of hats over the years and worked with a lot of different people. I’ve worked with some nice people and some characters. Sometimes I was treated fairly, and at times I was not. If some of those people are reading this and getting nervous, no need to worry, no bad stories or secrets will be told here. It’s been a wild and crazy 35 years but for the most part I wouldn’t trade a minute of it. Pharmacy has been good to me and my family, and I don’t have many regrets.

A pharmacy reunion
I still wonder though what we would talk about at this pharmacy reunion, especially with the old-timers I worked with at the beginning of my career. What would they think of pharmacy today? What would my college professors think? A lot of the places I worked at don’t exist anymore. We have all this technology such as scanners and computers, so what would everyone think about that? What would they think about the cost of pharmacy school, the number of prescriptions we fill daily, and our dissatisfaction with our role in health care. What would they think about how we take care of our patients?

I think they would probably look at our salaries, along with our benefits, vacation time, and other perks, and wonder what we are complaining about. They would comment on the fact that we have paid sick time when they never called in sick. That we can just ask for a vacation and usually get it, when they had to trade with coworkers or get their own relief help to cover their vacations. That we usually are not working on weekends or holidays when they worked most of them. I’m sure they would be surprised at people managing a pharmacy that never worked as a pharmacist.

Wimpy and whiny
Maybe after a couple of drinks at the reunion, they would get a little more vocal and wonder how we could be so wimpy and whiny about things. Why we don’t stand up for ourselves. Why we complain to each other on Internet blogs instead of to people who might be able to make a difference.

Why we continue to put up with metrics and intimidation. Why we sign bad contracts with PBMs. Why we act afraid to go to the bathroom when we need to. Why we aren’t interested in store ownership and being our own boss. How could we be so wimpy and whiny about things. Why we continue to put up with metrics and intimidation.

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Why we continue to put up with metrics and intimidation. Why we sign bad contracts with PBMs. Why we act afraid to go to the bathroom when we need to. Why we aren’t interested in store ownership and being our own boss. How could we be so wimpy and whiny about things.

I think my pharmacy reunion wouldn’t be that much fun after all. I would have a lot of explaining to do about what I have let the profession become. How I allowed company profits and my own personal gain trump patient care. They might ask me if playing it safe now will cause pharmacy to disappear in the near future. They might ask me that if I even care.

I think I’ll work that Saturday night shift and skip the pharmacy reunion. The district pharmacist scheduler has been asking me to work some extra shifts lately. There’s been talk of reducing our base hours. I could use the extra money too.

I’ll just not go. I don’t like discussing all these problems. They give me a headache anyway.

Jim “Goose” Rawlings is a senior pharmacist in central Indiana. He can be reached at snoozygoose@comcast.net.
This essay is the first in a series, highlighting sessions from this year’s International Pharmaceutical Federation (FIP) Congress. The article deals with the growing world of social media and its potential effects on pharmacy practice. Specifically, it covers the growth of various social media resources and what that may mean for patient access to pertinent and reliable health information, and how pharmacists can responsibly and effectively utilize these relatively new tools.

The term social media can refer to an Internet-based platform or application where users can create and share content interactively with other users. It provides an open forum in which individuals can express themselves and interact with others in the cyber world. Some examples of popular social media websites include Twitter, Facebook, and YouTube. These forms of social media can be accessed through computers, mobile phones, PDAs, and tablets, and are capable of being utilized quickly and easily. While the use of social media is still relatively new in health care, there is no question that it will continue to be utilized and expanded as time goes on.

While the original intention of social media networks, such as Facebook and Twitter, was to connect individuals, it has evolved and grown as a means to provide health-related information. With Twitter, health agencies, pharmacies, and hospitals are able to post links to important services and functions that they can offer individuals. Facebook can serve both as an online version of the yellow pages for local businesses and services, as well as an online location where individuals can discuss specifics of a condition in a forum dedicated to a specific disease state.

Open forums benefit patients
Patients can benefit through the use of open forums by discussing conditions and expectations of treatment and disease progression. The website patientslikeme.com offers resources and support to improve health. Patients can ask questions and receive answers. Members and operators of this website are able to accrue and distribute large amounts of information. The ability for this website to partner with universities and independent research foundations allows individuals much greater access to patient-specific treatments, including both risks and benefits.

One of our greatest concerns as pharmacists should be that safe and accurate information is disseminated through these social media channels. Scientifically proven facts and studies can be invaluable to patients, while inaccurate data can result in unsafe and dangerous outcomes. A great example of harmful information found on social media sites was that of the alleged link between MMR vaccinations and autism. While the basis for this link was a 1998 study that has since been debunked, the number of measles cases in the United Kingdom has increased dramatically in the past decade. The proliferation of misinformation through social media channels has led to tens of thousands of individuals being affected adversely.

During the roundtable discussion following the FIP Congress session, the general consensus among speakers was that, at this time, the pharmacist is best utilized as a source of confirmation of information accrued from online and social media sources. At the end of the day, pharmacists in all settings have to acknowledge that, as Dr. Cody Midlam said, “Social networks are here to stay.” For better or worse, patients will increasingly utilize the various forms of social media to obtain support and information to hopefully become better educated, and ideally healthier. With a plethora of potentially misleading knowledge available on the Internet and social forums, it becomes especially imperative that pharmacists be able to sort myth from truth for patients when they ask questions about information obtained from these websites.

Speakers for this session included the following distinguished individuals:
- Timothy Chen, the University of Sydney, Australia
- Marion Schaefer, Charité - Universitätsmedizin Berlin, Germany
- Khanal Saval, Sunsari Technical College, Nepal
- Cody Midlam, Duquesne University, Pittsburgh
- Rian Lelie-van der Zande, KNMP, The Netherlands.

Joel Claycomb

Joel Claycomb is a community pharmacist in Pittsburgh. He can be reached at jclaycomb@gmail.com.
Goal of improved health may fall short despite increased pharmacy workload

Working in a retail pharmacy can be incredibly frustrating at times. Throughout my years behind the counter though, while battling the ups and downs of modern drugstore workaday life of delays, interruptions, constant struggles with payers and other professionals, and, more recently, metrics, quotas, and multi-colored clocks that measure our speed, there was one thing I never questioned. That the ultimate goal was to improve the lives of our patients.

We may differ in our opinions of how it should be done, but the whole reason we are here is to help people live longer, healthier lives. That is the whole point of a healthcare system, and that much we should all agree on. Right?

Unfortunately, there are signs that we are starting to fail.

No one could argue that tremendous gains in health care haven’t been made in the postwar era. We wouldn’t want to go back to a time before penicillin or MRIs after all, but a closer look at more recent data reveals some disturbing trends. A study published in 2008 in the online journal PLOS showed that, from 1961 to 1983, there wasn’t a single county in the United States in which life expectancy declined. From 1983 to 1999 however, 11 counties had lower life expectancies for men, and 180 for women. This was followed in August of this year by an even more troubling report in the journal Health Affairs. From 1990 to 2008, white women without a high school diploma in the United States lost 5 years of life expectancy, and their male counterparts are living on average 3 fewer years than a generation ago.

Let that sink in. I’ll be willing to bet that your job is harder now than it was 20 years ago. That your stress level is higher, that more is expected of you, and that no matter how much pressure you felt you were under if you were working at the end of the first Bush administration, it is nothing compared to what you feel now.

And the payoff for all this? A significant number of your customers aren’t living as long as they were before you even had a fax machine in your pharmacy. Something is very wrong here. When experts are quoted in The New York Times saying things like “The five-year decline for white women rivals the catastrophic seven-year drop for Russian men in the years after the collapse of the Soviet Union,” it’s not something the health professions can be proud of.

The Times article goes on to say that this dramatic decline was caused by “a slowing or halt of reductions in cardiovascular disease, combined with increases in lung cancer and diabetes,” which should come as a slap across the face to a profession that claims its value in the modern healthcare system is an ability to educate patients about the basics of smoking cessation, blood pressure treatment, and diabetes care. If only we could muster the same urgency to address this problem that some chains give to making sure you are wearing your name tag.

So, what have gut-wrenching changes in pharmacy been for if not to improve the health of those we serve? At the risk of sounding cynical, perhaps the answer lies in a different set of numbers. The combined 2011 profits of the two largest drugstore chains and pharmacy benefit managers were just shy of $9 billion dollars, which tells me some people are doing just fine under the current healthcare system. Not, however, pharmacy employees who are under a large and ever-growing amount of stress in their working lives, or the patients who are ending up in an early grave. I started my career never questioning that our ultimate goal was to improve the lives of our patients. Today, however, I am desperate to be proven right.

David Stanley is a pharmacist, blogger, and professional writer in northern California. He can be reached at drugmonkeyrph@gmail.com.
The technician had kept her full attention on my transaction with this woman. She and I stood quietly and observed the patient make her way to the front of the store, down the cough/cold and pain medicine aisle. She walked slowly and gracefully, stopping every few feet to look at the compelling packaging that Pharma had designed just for her. She took a brightly colored bag of cough drops from its peg and studied it carefully. She seemed to be reading the advertising, but I didn’t think she was.

“She is so loaded,” I said and turned to go back to work.

“But, but,” the technician stammered, “But you said, No Alcohol.”

“No alcohol loaded,” I chuckled. “The other kind of loaded.”

The technician’s eyes widened. “No way,” she exclaimed. “She has to be your age.”

“Sixty-six,” I said. “Born in 1946. She was 21 during the Summer of Love. She smoked dope right along with almost everybody else, and she’s still smoking. Why should she stop?”

“Because she’s a grandmother. Grandmothers don’t get loaded.”

“Why not?” I asked. “It’s a lifestyle choice.” I looked at the tech, so young, so naive. “Back in the day, I dated loaded,” I said. “I went to church with loaded.” A dentist cancelled my appointment once because he confessed that he was loaded.

“But this woman is too old to be a drug addict.”

“But she is not too old to be loaded. The only prescription drug she takes is hydrochlorothiazide. We don’t know that she is addicted to anything.”

“Marijuana,” she said triumphantly. “You get addicted to hydrocodone, not likely to marijuana. Your boyfriend this morning with the starving-model-Izzy-Pop-greasy-stringy-hair-look told me he desperately needed his Norco, carisoprodol, and Xanax early, or he’d have a seizure. That’s probably addiction. If he died, it would be my fault,” he claimed.

“He is not my boyfriend.”

“Stop it.”

Marijuana is the Devil’s Drug. Remember Reefer Madness? But it is not a significant problem for the Boomers. A National Institutes of Health survey showed that in 2010 three times as many people aged 50 to 59 had abused potentially addictive prescription or illegal drugs than in 2002. Marijuana was not included in the study. Prescription drugs were the primary focus.

The Boomers were teens or young adults in the late 1960s and early 1970s, when drugs were all over the place and it seemed as if everybody was experimenting with them. LSD did not become illegal until 1971. Before that, it was no more controlled than jellybeans. Drugs were not respected by the kids wearing tie-dyed t-shirts, beards, and long hair. They threw away their bras and did drugs, and some of them are still living the day. They still do not respect drugs. No one seems to think drugs are dangerous. Notice how they barely pay attention when you counsel them that too much APAP can cause liver failure and that the chances for a liver transplant for an alcoholic or a druggie are slim.

Of course, many Boomers are still smoking dope. Their children, nieces, and nephews should be happy if it is just dope. Today’s killer combo hydrocodone/APAP really is addictive. Marijuana just makes Auntie Leslie slow and not the best conversationalist at Uncle Tommy’s Fourth of July lawn party.

Marijuana doesn’t kill old people. Prescription drug abuse does.

Florida has an inordinately high percentage of Boomers. In 2010, 981 Floridians over the age of 45 died as a result of accidental poisonings from prescription drugs. And that is the official number. How many were found dead in their chairs, with the channel that the game was on the night before still humming?

Officially, he was old. It was his time. And nobody noticed the empty hydrocodone vial on the floor among the empty beer cans.

Marijuana doesn’t kill old people. Prescription drug abuse does.

Jim Plagakis is a community pharmacist in Galveston, Texas. You can e-mail him at jpgakis@hotmail.com and cc us at drugtopics@advanstar.com. You can also check out his website at jim plagakis.com.
New Once-daily
Quillivant XR™
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The first extended-release methylphenidate oral suspension for ADHD treatment

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INDICATION
Quillivant XR is a central nervous system (CNS) stimulant indicated for the treatment of Attention Deficit Hyperactivity Disorder (ADHD). The efficacy of Quillivant XR was established in a 2-week, placebo-controlled trial in children aged 6 to 12 years with a diagnosis of ADHD. Accumulated efficacy data from other methylphenidate products were also considered.

IMPORTANT SAFETY INFORMATION

WARNING: ABUSE AND DEPENDENCE
CNS stimulants, including Quillivant XR, other methylphenidate-containing products, and amphetamines, have a high potential for abuse and dependence. Assess the risk of abuse prior to prescribing, and monitor for signs of abuse and dependence while on therapy.

• Quillivant XR is contraindicated in patients with known hypersensitivity to methylphenidate or product components, and in patients who are taking concurrent treatment with a monoamine oxidase inhibitor (MAOI), or have used an MAOI within the preceding 14 days
• Sudden death has been reported in association with CNS stimulants at recommended doses in children and adolescents with structural cardiac abnormalities or other serious heart problems. In adults, sudden death, stroke, and myocardial infarction have been reported. Avoid use in patients with known structural cardiac abnormalities, cardiomyopathy, serious heart arrhythmias, or coronary artery disease
• Monitor blood pressure and pulse. Consider the benefits and risks in patients for whom an increase in blood pressure or heart rate would be problematic
• Use of stimulants may cause psychotic or manic symptoms in patients with no prior history, or exacerbation of symptoms in patients with pre-existing psychiatric illness. Evaluate for bipolar disorder prior to Quillivant XR use
• Monitor height and weight at appropriate intervals in pediatric patients for long-term suppression of growth
• Based on accumulated data from other methylphenidate products, the most common adverse reactions are appetite decreased, insomnia, nausea, vomiting, dyspepsia, abdominal pain, weight decreased, anxiety, dizziness, irritability, affect lability, tachycardia, and blood pressure increased
• Based on animal data, use of Quillivant XR during pregnancy may cause fetal harm. Nursing mothers should be advised to discontinue drug or discontinue nursing, taking into consideration the importance of the drug to the mother

Please see Brief Summary of Prescribing Information, including BOXED WARNING regarding Abuse and Dependence, on following page.
Quillivant XR™ (methylphenidate HCL) for extended-release oral suspension, CII Rx only

BRIEF SUMMARY: Consult Full Prescribing Information. HIghlights: Product Information.

WARNING: ABUSE AND DEPENDENCE
CNS stimulants, including Quillivant XR, other methylphenidate-containing products, and amphetamines, have a high potential for abuse and dependence. Assess the risk of abuse prior to prescribing, and monitor for signs of abuse and dependence while on therapy [see Warnings and Precautions, Drug Abuse and Dependence].

INDICATIONS AND USAGE
Quillivant XR is indicated for the treatment of Attention Deficit Hyperactivity Disorder (ADHD). The efficacy of Quillivant XR was established in a 2-week, placebo-controlled, laboratory classroom, crossover study in children aged 6-12 years with a diagnosis of ADHD. Patients in the trial met DSM-IV-TR criteria for ADHD. Accumulated efficacy data from other methylphenidate products were also considered.

CONTRAINDICATIONS
Hyperactivity to methylphenidate or other Components of Quillivant XR.

Quillivant XR is contraindicated in patients known to be hypersensitive to methylphenidate, or other components of Quillivant XR. Hyperactivity reactions such as angioedema and anaphylactic reactions have been reported in patients treated with other methylphenidate products.

Monoamine Oxidase Inhibitors Quillivant XR is contraindicated during treatment with monoamine oxidase inhibitors, and also 14 days following discontinuation of treatment with a monoamine oxidase inhibitor (MAOI), because of the risk of hypertensive crisis.

WARNINGS AND PRECAUTIONS
Potential for Abuse and Dependence CNS stimulants, including Quillivant XR, other methylphenidate-containing products, and amphetamines, have a high potential for abuse and dependence. Assess the risk of abuse prior to prescribing, and monitor for signs of abuse and dependence while on therapy [see Drug Abuse and Dependence].

Serious Cardiovascular Reactions Stroke and myocardial infarction have occurred in adults treated with CNS stimulants at recommended doses. Sudden death has occurred in children and adolescents with structural cardiac abnormalities and other serious cardiac problems, and in adults taking CNS stimulants at recommended doses for ADHD. Avoid use in patients with known structural cardiac abnormalities, cardiomyopathy, serious cardiac arrhythmias, coronary artery disease, or other serious cardiac problems. Further evaluate patients who develop exertional chest pain, unexplained syncope, or arrhythmias during treatment with Quillivant XR.

Blood Pressure and Heart Rate Increases CNS stimulants cause an increase in blood pressure (mean increase approximately 2 to 4 mmHg) and heart rate (mean increase approximately 0 to 6 bpm). Individuals may have larger increases. Monitor all patients for hypertension and tachycardia.

Psychiatric Adverse Reactions Exacerbation of Pre-Existing Psychosis CNS stimulants may exacerbate symptoms of behavior disturbance and thought disorder in patients with a pre-existing psychotic disorder.

Induction of a Manic Episode in Patients with Bipolar Disorder CNS stimulants may induce a manic or mixed episode in patients. Prior to initiating treatment, screen patients for risk factors for developing a manic episode (eg., comorbid or history of depression or suicide, bipolar disorder, or depression). New Psychotic or Manic Symptoms CNS stimulants, at recommended doses, may cause psychotic or manic symptoms (eg., hallucinations, delusional thinking, or mania) in patients without a prior history of psychotic illness or mania. If such symptoms occur, consider discontinuing Quillivant XR. In a pooled analysis of multiple short-term, placebo-controlled studies of CNS stimulants, psychotic or manic symptoms occurred in approximately 0.1% of CNS stimulant-treated patients, compared to 0 in placebo-treated patients.

Long-Term Suppression of Growth CNS stimulants have been associated with weight loss and slowing of growth rate in pediatric patients. Closely monitor growth (weight and height) in pediatric patients treated with CNS stimulants, including Quillivant XR. Careful follow-up of weight and height in children ages 7 to 10 years who were randomized to either methylphenidate or nonmedication treatment groups over 14 months, as well as in naturalistic subgroups of newly methylphenidate-treated and nonmedication-treated children over 36 months (to the ages of 10 to 13 years), suggests that consistently medicated children (i.e., treatment for 7 days per week throughout the year) have a temporary slowing in growth rate (on average, a total of about 2 cm less growth in height and 2.7 kg less growth in weight over 3 years), without evidence of growth rebound during this period of development. Published data are inadequate to determine whether chronic use of amphetamines may cause a similar suppression of growth; however, it is anticipated that they likely have this effect as well. Therefore, growth should be monitored during treatment with stimulants, and patients who are not growing or gaining height or weight as expected may need to have their treatment interrupted.

ADVERSE REACTIONS
Clinical Trials Experience Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates of adverse reactions in clinical practice. Clinical Trials in children, adolescents, and adults with ADHD Commonly reported (≥2% of the methylphenidate group and at least twice the rate of the placebo group) adverse reactions from placebo-controlled trials of methylphenidate products include: appetite decreased, weight decreased, nausea, abdominal pain, dyspepsia, dry mouth, vomiting, insomnia, anxiety, nervousness, restlessness, affect liability, agitation, irritability, dizziness, vertigo, tremor, blurred vision, blood pressure increases, heart rate increased, tachycardia, palpitations, hyperactivity, and perspiration. Clinical Trials Experience with Quillivant XR in Children and Adolescents with ADHD. There is limited experience with Quillivant XR in controlled trials. Based on this limited experience, the adverse reaction profile of Quillivant XR appears similar to other methylphenidate extended-release products. The most common (≥2% in the Quillivant XR group and greater than placebo) adverse reactions reported in the Phase 3 controlled study conducted in ≥45 ADHD patients (ages 6-12 years) were affect liability, exacerbation, initial insomnia, tic, decreased appetite, vomiting, motion sickness, eye pain, and rash.

Table 2. Common Adverse Reactions occurring in ≥2% of subjects on Quillivant XR and greater than placebo during the controlled cross-over phase

<table>
<thead>
<tr>
<th>Adverse reaction</th>
<th>Quillivant XR (N=45)</th>
<th>Placebo (N=45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affect liability</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Excoriation</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Initial insomnia</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Tic</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Decreased appetite</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Motion sickness</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Eye pain</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Rash</td>
<td>2%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Postmarketing Experience The following adverse reactions have been identified during post approval use of methylphenidate products. Because these reactions are reported voluntarily from a population of uncertain size, it is not possible to reliably estimate their frequency or establish a causal relationship to drug exposure. These adverse reactions are as follows:

- Blood and Lymphatic System Disorders: Pancytopenia, Thrombocytopenia, Thrombocytopenic purpura
- Cardiac Disorders: Angina pectoris, Bradycardia, Extra-styloid, Supraventricular tachycardia, Ventricular extra-styloid
- Eye Disorders: Diplopia, Mydriasis, Visual impairment
- General Disorders: Chest pain, Chest discomfort, Hyperspyrexia
- Immune System Disorders: Hyperactivity reactions such as Angiokeratoma, Anaphylactic reactions, Auricular swelling, Bullous conditions, Erythematous conditions, Urticarias,
- Liver/Digestive system reactions:
- Pruritus NEC, Rashes, Eruptions, and Exanthemas NEC
- Investigations: Alkaline phosphatase increased, Bilirubin increased, Hepatic enzyme increased, Platelet count decreased, White blood cell count abnormal
- Musculoskeletal: Connective Tissue and Bone Disorders Arthralgia, Myalgia, Muscle twitching
- Nervous System Disorders: Convulsion, Grand mal convulsion, Dizziness
- Psychiatric Disorders: Disorientation, Hallucination, Hallucination auditory, Hallucination visual, Mania
- Urinary System: Priapism
- Skin and Subcutaneous Tissue Disorders: Alopecia, Erythema
- Vascular Disorders: Raynaud’s phenomenon

DRUG INTERACTIONS
MAO Inhibitors Do not administer Quillivant XR concomitantly with monoamine oxidase inhibitors or within 14 days after discontinuing MAOI treatment. Concomitant use of MAOs and CNS stimulants can cause hypertensive crisis. Potential outcomes include death, stroke, myocardial infarction, ventricular fibrillation, and other lifethreatening complications. Acute ingestion of MAOIs and CNS stimulants can cause hypertensive crisis. Symptoms of overdose include dizziness, headache, nausea, vomiting, agitation, delirium, hyperthermia, hypertension, tachycardia, arrhythmias, convulsions, and coma. Treatment is supportive and symptomatic.

WARNINGS AND PRECAUTIONS

Drug Abuse and Dependence

MAO Inhibitors Do not administer Quillivant XR concomitantly with monoamine oxidase inhibitors or within 14 days after discontinuing MAOI treatment. Concomitant use of MAOs and CNS stimulants can cause hypertensive crisis. Potential outcomes include death, stroke, myocardial infarction, ventricular fibrillation, and other lifethreatening complications. Acute ingestion of MAOIs and CNS stimulants can cause hypertensive crisis. Symptoms of overdose include dizziness, headache, nausea, vomiting, agitation, delirium, hyperthermia, tachycardia, arrhythmias, convulsions, and coma. Treatment is supportive and symptomatic.

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Minn. ACO uses MTM to reduce hospital readmissions

Christine Blank

The Hennepin County Medical Center (HCMC), based in Minneapolis, Minn., significantly reduced hospital readmissions and emergency room visits by forming an accountable care organization (ACO) team.

Under the ACO model, healthcare providers are accountable for care, quality, and cost of the Medicaid beneficiaries’ services, explained Bruce Thompson, RPh, MS, director of pharmacy services for HCMC, at the McKesson ideaShare program held this summer in Las Vegas, Nev. The ideaShare continuing education program was developed and sponsored by The Institute of Wellness and Education.

The Minnesota Department of Human Services provided a $32 million grant to HCMC and three other hospitals for late 2010 through 2011 to take care of patients in an ACO program after the Minnesota General Assistance program was discontinued in April 2010. HCMC is a 454-bed hospital with 60 clinics and 16 ambulatory pharmacists that provide medication therapy management (MTM) services.

HCMC staff carefully tracked the progress and costs associated with approximately 8,000 patients after segmenting them into three groups based on past hospitalizations and expenses accrued. Patients who had not been hospitalized in the past year were in tier 1, those who were hospitalized once in the tier 2 group, and those hospitalized more than once were in tier 3. Tier 3 patients were assigned a multidisciplinary team that included a pharmacist, physicians, a social worker, nurse practitioners, and other health professionals, depending on the patient.

Quillivant XR (methylphenidate HCl). Brief Summary continued...

Development of Quillivant XR development were observed. The no effect level for pre- and postnatal development in rats was 15 mg/kg/d (equal to the MRHD on a mg/m² basis). Nursing Mothers Methylphenidate is present in human milk. Long-term neurodevelopmental effects on infants from stimulant exposure are unknown. Because of the potential for serious adverse reactions in nursing infants, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. Pediatric Use The safety and effectiveness of Quillivant XR have been established in pediatric patients ages 6 to 17 years. Use of Quillivant XR in pediatric patients 6 to 12 years of age is supported by the well-controlled and well-controlled studies. Use in 12 to 17 year olds is supported by the adequate and well-controlled studies of Quillivant XR in younger pediatric patients and additional pharmacokinetic data in adolescents, along with safety information from other methylphenidate-containing products. The long-term efficacy of methylphenidate in pediatric patients has not been established. Safety and efficacy in pediatric patients below the age of 6 years have not been established. Long Term Suppression of Growth Growth should be monitored during treatment with stimulants, including Quillivant XR. Children who are not growing or gaining weight as expected may need to have their treatment interrupted (see Warnings and Precautions).

Juvenile Animal Data Rats treated with methylphenidate early in the postnatal period through sexual maturation demonstrated a decrease in spontaneous locomotor activity in adulthood. A deficit in acquisition of a specific learning task was observed in females only. The doses at which these findings were observed are at least 6 times the maximum recommended human dose (MRHD) on a mg/m² basis. In the study conducted in young rats, methylphenidate was administered orally at doses of up to 100 mg/kg/day for 9 weeks, starting early in the postnatal period (postnatal day 7) and continuing through sexual maturity (postnatal week 10). When these animals were tested as adults (postnatal weeks 13-14), decreased spontaneous locomotor activity was observed in males and females previously treated with 50 mg/kg/day (approximately 6 times the maximum recommended human dose (MRHD) on a mg/m² basis) or greater, and a deficit in the acquisition of a specific learning task was observed in females exposed to the highest dose (12 times the MRHD on a mg/m² basis). The no effect level for juvenile neurobehavioral development in rats was 5 mg/kg/day (half the MRHD on a mg/m² basis).

Geriatric Use Quillivant XR has not been studied in patients over the age of 65 years.

Drug Abuse and Dependence

Controlled Substance Quillivant XR contains methylphenidate, a Schedule II controlled substance.

Abuse Signs and symptoms of CNS stimulant abuse include increased heart rate, respiratory rate, blood pressure, and/or sweating, dilated pupils, hyperactivity, restlessness, insomnia, decreased appetite, loss of coordination, tremors, flushed skin, vomiting, and/or abdominal pain, Anxiety, psychosis, hostility, aggression, suicidal or homicidal ideation have also been observed. Absusers of CNS stimulants may chew, snort, inject, or use other unapproved routes of administration which can result in overdose and death (see Overdosage). To reduce the abuse of CNS stimulants including Quillivant XR, assess the risk of abuse prior to prescribing. After prescribing, keep careful prescription records, educate patients and their families about abuse and on proper storage and disposal of CNS stimulants; monitor for signs of abuse while on therapy, and re-evaluate the need for Quillivant XR use.

Dependence Tolerance Tolerance (a state of adaptation in which exposure to a drug results in a reduction of the drug’s desired and/or undesired effects over time) can occur during chronic therapy with CNS stimulants including Quillivant XR. Dependence Physical dependence (a state of adaptation manifested by a withdrawal syndrome produced by abrupt cessation, rapid dose reduction, or administration of an antagonist) can occur in patients treated with CNS stimulants including Quillivant XR. Withdrawal symptoms after abrupt cessation following prolonged high-dosage administration of CNS stimulants include extreme fatigue and depression.

Overdosage

Signs and Symptoms Signs and symptoms of acute methylphenidate overdosage, resulting principally from overstimulation of the CNS and from excessive sympathomimetic effects, may include the following: nausea, vomiting, diarrhea, restlessness, anxiety, agitation, tremors, hyperreflexia, muscle twitching, convulsions (may be followed by coma), euphoria, confusion, hallucinations, delirium, sweating, flushing, headache, hypertension, tachycardia, palpitations, cardiac arrhythmias, hyperventilation, tachypnea, mydriasis, and dryness of mucus membranes. Management of Overdose Consult with a Certified Poison Control Center for up-to-date guidance and advice on the management of overdosage with methylphenidate (1-800-222-1222). Provide supportive care, including close medical supervision and monitoring. Treatment should consist of those general measures employed in the management of overdosage with any drug. Consider the possibility of multiple drug overdosage. Ensure an adequate airway, oxygenation, and ventilation. Monitor cardiac rhythm and vital signs. Use supportive and symptomatic measures.
Wide discrepancy in multidrug-resistant organisms surveillance among ICUs

Screening practices for multidrug-resistant organisms (MDROs) in intensive care units (ICUs) vary widely from hospital to hospital, according to a new study published in the October issue of the American Journal of Infection Control, the official publication of the Association for Professionals in Infection Control and Epidemiology (http://www.ajicjournal.org/).

“There is variation in the types of multidrug-resistant organisms that hospitals screen for and in the surveillance and infection control practices that hospitals use to control/prevent these infections on the national level,” said lead author Monika Pogorzelska PhD, MPH, from the Columbia University School of Nursing.

The P-NICE interdisciplinary research team from the Columbia University School of Nursing collected and analyzed online survey responses from the infection preventionists of 250 hospitals that participated in the CDC's National Healthcare Safety Network (NHSN) in 2008. The goal of the study was to explore the relationship between hospital and infection control characteristics and adoption, monitoring, and implementation of infection control policies aimed at MDROs.

Researchers found that participating NHSN ICUs routinely screened for methicillin-resistant Staphylococcus aureus (59%). However, other potentially deadly MDROs were screened for far less frequently: vancomycin-resistant Enterococcus (22%), gram-negative rods (12%), and Clostridium difficile (11%).

Fifty percent of ICUs reported having a written policy to screen for any MDRO, and less than one-third (27%) had a policy for periodic screening following admission. One-third reported having a policy requiring isolation/contact precautions pending screening, 98% reported requiring contact precautions for culture-positive patients, and 42% reported having a policy for grouping colonized patients together.

The study found that having state-mandated reporting, being a teaching hospital, having 201 to 500 beds, and being located in the western United States were factors associated with having a policy to screen all admissions for any MDRO. Periodic screening after admission was correlated with mandated reporting, teaching status, and use of an electronic surveillance system.

“Healthcare-associated infections [HAI] are a major patient safety issue in hospitals and many of them are caused by organisms that are resistant to at least one class of antibiotics,” Pogorzelska said. “There is a lack of data on the national level as to what hospitals are doing to prevent/control these infections and the organisms that they are focusing on. So, we conducted this survey to get a snapshot of the types of activities related to multidrug infections that hospitals use and to see whether we can identify hospital characteristics that are associated with adoption of policies.”

“The take-away message of this study is that the majority of hospitals are focusing on routine surveillance for MRSA, with less focus placed on screening for other organisms, which may reflect increased focus and response to different initiatives aimed at MRSA on the national level,” she said. “Another important take-away point is that there is variation in the implementation of different infection control policies aimed at multidrug-resistant infections.”

For example, according to Pogorzelska, almost all of the hospitals reported having a policy for contact precautions following a positive culture in their ICU (98%), but less than one-third of ICUs reported that patients were placed on contact precautions pending the results of a screen.

“This is an important distinction in that patients who are screened and potentially colonized with a multidrug-resistant infection and who are not placed on contact precautions pending the results of the screen, may be a potential source of transmission in the hospital,” she said.

Statin adherence drives health, Rx costs

Individuals with high cholesterol who stay on their statin medications over a two-year period are healthier than comparable nonadherent individuals, but the overall cost of their care is slightly higher, according to a new study published in the September issue of the Journal of Managed Care Pharmacy.

While the new study aligns with earlier ones that also showed adherent individuals had improved health and lower medical costs, this study varies from others in concluding that the overall cost of care is higher. In earlier studies, the overall cost of care was lower as decreased medical costs for their care more than offset the higher pharmacy costs.

“It’s important to emphasize that our study showed that adherence to statins was associated with lower medical costs and hospitalizations, leading to healthier outcomes for individuals,” said Pat Gleason, PharmD, FCCP, BCPS, director of health outcomes with Prime Therapeutics.
Gleason is the lead author of the study, “Statin Medication Adherence Association with Hospitalizations or Emergency Room Visits and Total Cost of Care Over Two Years,” which was presented Oct. 4 at the Academy of Managed Care Pharmacy’s 2012 Educational Conference.

**Fewer hospital, ED visits**

Conducted in collaboration with Blue Cross and Blue Shield of Minnesota, the study found individuals adherent to statin medications went to the hospital or emergency department 2.6% less often than nonadherent individuals, resulting in medical costs that were 7% lower (a difference of $767). The lower medical costs, however, were offset by pharmacy costs that were 45% higher (a difference of $1,606).

Researchers compared medical and pharmacy costs among individuals with high cholesterol who were adherent to statin medication to individuals who were not adherent (“adherence” was defined as “following the medication regimen 80% of the time or more”). Of the 45,869 individuals included in the study, 21,693 (47.3%) were adherent and 24,176 (52.7%) nonadherent during the two-year follow-up period.

Population differences, including the relatively young ages of the individuals in the new study, are a possible reason its findings differ from those of previous studies, Gleason said. The earlier studies each had a specific population focus—individuals from a single employer in one study, and retirees in the other. As a result, the cost analyses from the earlier studies were limited in their generalizability.

The study is part of an ongoing effort by Prime and Blue Cross to understand the connection between adherence and total cost of health care, including hospitalizations.

“With the increasing availability of generic statins, especially the generic atorvastatin of the brand Lipitor, we may see lower pharmacy costs in future studies like this,” Gleason added.
Pharmacy ownership path strewn with rewards, challenges

Owning a pharmacy may sound like a dream, but the reality is that the road to pharmacy ownership is complex and often requires careful planning and a penchant for risk.

“There’s a certain psyche you have to have to be an owner,” said Robert E. Graul, BS Pharm, MBA, national vice president, RxOwnership, McKesson U.S. Pharmaceutical.

Graul described what it takes to open a pharmacy during a program at the recent McKesson ideaShare 2012 meeting in Las Vegas.

The first step toward pharmacy ownership, he said, is to determine whether you have the financial resources, personality traits, and business skills necessary to be a successful owner.

“You have to be an innovator,” Graul said. “You have to be looking at new ways to serve your patients.”

Startup capital and planning

One of the biggest mistakes owners make is not having the capital they need to open the business. Before they open their doors, Graul said, owners of new start-up pharmacies should have between $350,000 to $400,000 in capital to help with immediate business costs such as equipment, flooring, salaries, and insurance.

“You can’t go too low when you go into it, because you won’t have enough money to support you until you break even on expenses,” he said.

Potential pharmacy owners can begin to prepare for upcoming expenses and plan for other aspects of ownership by creating a thorough and detailed business plan. In addition to financial plans and projections, business plans should include a demographic analysis, analysis of competitors, information about what will distinguish their pharmacy from others, details on pharmacy and front-end offerings, contingency plans, and a marketing plan.

Graul said potential owners also need to develop their pharmacy’s business concept and plan for the services they plan to offer, whether compounding, medication therapy management, or immunizations.

“In most businesses you can’t be everything to everybody, especially at the start,” Graul said.

A team of consultants

To assist with the planning process, pharmacy owners will need to align themselves with a team of professional consultants, including legal counsel, an accountant, and an insurance agent.

Whether you are purchasing an existing pharmacy or starting a new pharmacy, Graul said, another important consideration — and also potential pitfall — is choosing a location.

Before signing on the dotted line, potential new owners need to research the pharmacy’s location and viability by conducting a market analysis, reviewing demographic surveys or projections, speaking with local business owners, and talking to local physicians and healthcare providers.

Graul said that McKesson can help potential owners with some of the more complicated aspects of the research; however, owners can do some of the legwork themselves by evaluating traffic patterns, reviewing available parking, and learning more about the location’s anchor tenant, if the location is in a strip mall.

Once a location is secured, the next step is to focus on the business aspect of pharmacy ownership. Pharmacy owners need to work with their advisors to determine the corporate structure for their business, secure the necessary licenses, and plan for the financial and accounting practices they plan to implement.

Meeting the business demands of the pharmacy isn’t the only factor that can contribute to the business’ overall success. The pharmacy’s design and layout are also important. Graul said owners need to carefully design the area behind the counter for maximum workflow efficiency while focusing on a front-end design that is easily accessible and inviting to all types of patients.

Pharmacy owners also have to be comfortable stepping outside their role as a pharmacist to assume the responsibilities of a retailer as well. Before opening their doors, owners need to decide pricing matrices, along with the best mix of private label and generic medications in over-the-counter products, and determine what other merchandise they plan to sell.

To run an efficient and cost-effective pharmacy, owners also need to adopt technology that takes into account their short- and long-term automation needs and hire a talented and trusted group of employees to help the business operate smoothly.

But even the best pharmacies can’t succeed if customers don’t know they exist. Developing a proactive marketing plan that outlines plans for a grand opening, advertising, special events, and other ways the pharmacy can show it meets a need within the community will ensure that customers will take notice. An independent owner who takes an active role in the community through volunteering, sponsorship, or networking can help foster community support, Graul said.

“There’s a lot of local marketing that can be done,” he said.

Jill Sederstrom is a freelance writer based in Kansas City.
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The Centers for Disease Control and Prevention (CDC) continue to track the number of cases and deaths from fungal infections linked to contaminated steroid injections that were prepared by the New England Compounding Center (NECC) based in Framingham, Mass. Three months after the first cases of a rare form of fungal meningitis were reported, there are now 510 cases in 19 states and 36 patients have died after receiving preservative-free methylprednisolone that came from one of three lots produced by NECC. The failure to maintain sterility in the pharmacy has led to a major threat to public safety.

Congress held hearings in mid-November to examine the facts surrounding the fungal meningitis outbreak and to review the history of complaints associated with NECC and the inspections and actions taken by the FDA and the Massachusetts Department of Public Health. The House Subcommittee on Oversight and Investigations convened on November 14 for its hearing, “The Fungal Meningitis Outbreak: Could It Have Been Prevented?” and the Senate Committee on Health, Education, Labor, and Pensions also heard testimony the following day during its hearing, “Pharmacy Compounding: Implications of the 2012 Meningitis Outbreak.”

Could it have been prevented?

The Oversight and Investigations subcommittee called a number of witnesses to testify, including Joyce Lovelace, the widow of Eddie Lovelace, 78, one of the first victims to die from a stroke following three spinal injections of steroids. Joyce Lovelace asked that the legislators find out how and why such a tragedy could happen and to work to close any “loopholes that allow these industries to escape meaningful inspection.”

Barry J. Cadden, president, co-owner, and director of pharmacy, NECC, also was called to testify. He invoked his Fifth Amendment right not to testify and was dismissed from the hearing.

FDA Commissioner Margaret Hamburg, MD, and Lauren Smith, MD, MPH, interim commissioner of the Massachusetts Department of Public Health, also testified.

Prior to the hearing, Chairman Rep. Cliff Stearns (R-Florida) and others on the Oversight and Investigations subcommittee had reviewed a 25-page report that described the background of the current meningitis outbreak and the history of state and federal investigations of NECC. The report revealed that the FDA had conducted three earlier inspections of NECC prior to the latest inspections in September and October 2012. Those three inspections resulted in the FDA issuing two Form 483s in 2002 and 2003 and a warning letter to NECC in 2006. The Massachusetts Board of Pharmacy had investigated a dozen complaints since NECC opened its doors in 1998.

The problems with NECC that were identified over the last decade included:
1. Solicitation of business in 2001 for drug products that should have been discontinued by the manufacturer.
3. Unprofessional conduct and failure to adhere to standards of practice, which led to the state board issuing advisory letters to Cadden and NECC in 2004.
4. Adverse events reported to the FDA’s MedWatch in 2002, involving epidural betamethasone repository injections and leading to an FDA inspection.
5. Failure to follow guidelines, sterility procedures, record-keeping requirements, batch record requirements, and failing to provide certificates of analysis, proof of sterility testing, Endotoxin test results, batch numbers, and prescriptions upon request.
6. Inspections related to methylprednisolone acetate in 2002 following three MedWatch reports. This was the same type of drug that was contaminated and led to the current meningitis outbreak. Two patients had been hospitalized with meningitis-like symptoms in 2002. They received antibiotics and survived.

7. Complaint in 2004 by a Wisconsin pharmacist that raised concerns about an “extra strength triple anesthetic cream” that NECC was soliciting.

8. Another complaint in 2004 from a pharmacist in Iowa that NECC was “advertising compounded prescription products which constituted manufacturing.”

9. In 2004, compounding a non-FDA product, Trypan Blue Dye, which is not approved for capillary stain during cardiac procedures.

In 2006, the FDA issued a warning letter to NECC, explaining that it had violated the federal Food, Drug, and Cosmetic Act, and that if Cadden did not promptly correct “these deviations,” NECC would be subject to additional regulatory action without further notice.

“FDA was slow to act,” stated Chairman Stearns in his opening remarks to the Oversight and Investigations subcommittee. “It took four years to issue a simple warning letter and another 2 years to respond to specific claims in 2008. It directed [NECC] to correct violations and FDA did not follow up.”

According to Rep. Henry Waxman (D-California), both state and federal regulators deserve blame for this tragedy. “Massachusetts Board of Pharmacy had primary jurisdiction, but the board never took action tough enough,” Rep. Waxman said during the hearing. “FDA conducted investigations and its most aggressive action was a warning letter in 2006.”

Rep. Frederick Upton (R-Michigan), whose state has witnessed the greatest number of cases associated with the outbreak, expressed his frustration that, despite numerous inspections, the FDA did not seem to want to work with the Oversight and Investigations subcommittee. “We want to get to the bottom of this [tragedy] and find out what really did break down. This is not going to be the last hearing. We need a commitment to know where this train got off the track. FDA should work with us,” he told FDA Commissioner Hamburg. The bipartisan subcommittee members had requested in mid-October that the FDA provide internal communications or memoranda in response to any possible weaknesses in FDA’s regulatory system. According to Rep. Upton, the FDA had not provided this needed information.

**FDA responds**

FDA officials have oversight for drug manufacturers, Commissioner Hamburg explained. “We have ambiguous, contested authority with oversight of compounding,” she said during the hearing. “We need a risk-based framework to oversee non-traditional compounding. Traditional compounding can continue to be overseen at the state level.”

Commissioner Hamburg testified that Congress needs to strengthen the FDA’s authority over non-traditional compounding to prevent this kind of tragedy from happening again. “If we fail to act, this type of incident will happen again. It is a matter of when, not if,” she said.

**Sharing the blame**

Based on the information from the Congressional hearings and the documents presented to the House Energy and Commerce subcommittee, David Miller, PharmD, executive director and CEO, International Academy of Compounding Pharmacists (IACP), said that the fungal meningitis outbreak can be attributed to three specific breakdowns in the drug distribution system. Miller was one of the witnesses to testify during the Senate hearing.

First, NECC violated state and federal laws pertaining to compounding by engaging in what is considered manufacturing practices. “They [NECC] also ignored every practice standard on the books that they should have [followed] and, we believe, are required to follow, which are the USP standards. So, even though there were other problems that occurred that contributed to the NECC meningitis crisis, the real fault lies squarely on the principals and all the pharmacists and technicians that were working at the facility,” Miller said.

The state and federal regulators did identify problems dating back to a decade earlier, which indicated that NECC had failed “to maintain adequate safeguards for sterile injectable products—the very issue at the center of the current meningitis outbreak,” according to the documents provided to the Oversight and Investigations subcommittee before the November 14 hearing.

“We now know that Massachusetts had a long-standing history of disciplinary actions, problems, issues with NECC, and yet continued to allow the pharmacy to practice and be open in light of—and in spite of—those egregious violations of their own state act,” said Miller in an interview with *Drug Topics*.

The FDA had conducted a series of inspections at NECC dating back to 2002. However, “it took FDA 2 years from its 2004 inspection to send a warning letter and then another 2 years to respond. Then, there was no further followup,”
Dr. Miller continued. “So, our regulatory authorities also dropped the ball.”

Others also share the blame, including the healthcare providers, clinics, and hospitals that obtained a compounded medication when a manufactured medication could have been purchased and was available on the market, Dr. Miller explained. In addition, the lots of medication under investigation had evidence of black particulate matter and the healthcare providers never seemed to notice or question the injectable steroids that they were using, he said.

**FDA’s authority**

So, did the FDA have the authority to shut down NECC, or was there a “gray area” in which they had “ambiguous contested authority” as Commissioner Hamburg testified?

Miller of IACP told *Drug Topics* that the FDA had the authority to shut down NECC as an illegal manufacturer. “Yet, despite claiming that FDA had the authority according to its own documentation, FDA officials did not take action,” Miller said. “There were lots of excuses used [during the hearing], such as ‘our authority is unclear.’ It is not unclear.”

Sarah Sellers, PharmD, MPH, a quality consultant and former FDA employee, also believes that the FDA did not use all of its enforcement authority when dealing with NECC, partly because of its decisions on resource allocations.

“FDA does not have enough resources to fulfill its mandate even for FDA-approved products in the marketplace. So, the compounding arena is probably last on its list because it takes an extraordinary amount of resources for the surveillance aspect,” Dr. Sellers told *Drug Topics* in an interview.

Thus, in the case of NECC, FDA was reactive instead of proactive, which is problematic, she said. “If we wait for FDA to go in after something bad happens, that is not protective public health policy,” explained Dr. Sellers, who was a compliance officer for the FDA and is now president of Q-Vigilance, LLC.

**VALID Compounding Act**

At the beginning of November, Congressman Edward J. Markey (D-Mass.), introduced legislation that he contended would strengthen federal regulations for compounding pharmacies. The Verifying Authority and Legality in Drug (VALID) Compounding Act would “give FDA clear, new authority to oversee compounding pharmacy practices throughout the country,” according to a press release on Rep. Markey’s website.

The VALID Compounding Act proposes the following:

1. Preserve state regulatory authority for traditional, small compounding pharmacy activities;
2. Ensure that compounding pharmacies that are operating as drug manufacturers are regulated by FDA as drug manufacturers;
3. Allow compounding pharmacies with a legitimate reason to compound drugs to request a waiver to enable them to do so before the receipt of a valid prescription;
4. Allow FDA to waive the requirement to compound drugs solely for individual patients with valid prescriptions in the event of a drug shortage or to protect public health;
5. Allow FDA to waive the requirement to compound drugs only if they are not copies of commercially-available drugs if doing so is necessary to protect public health or well-being; and
6. Increase transparency to the public by mandating that compounded drugs be labeled to ensure that recipients know that the drugs have not been tested for safety or effectiveness, publishing a “Do Not Compound” list of unsafe or ineffective drugs, and reporting of bad reactions to compounded drugs or any drug that poses a safety risk.

Responses to the VALID Compounding Act have been mixed. Miller said that IACP does support some of the provisions of Markey’s bill, such as allowing collaboration between the FDA and compounding pharmacies to make compounding preparations in the case of drug shortages and to protect the public health. IACP also supports a process for pharmacies to compound preparations to provide doctors, hospitals, and clinical practice sites with medications necessary for administration to patients as part of their medical treatment. In addition, IACP agrees that the FDA needs clear authority to inspect any compounding pharmacy, although Miller says that that authority already exists. IACP also agrees that the FDA “Do Not Compound” list of drugs should be available, but should be updated by the FDA. According to Miller, the list has not been revised in at least 6 years.

IACP does have concerns about some parts of Congressman Markey’s bill, specifically about the types of pharmacies that are eligible to receive a waiver of the requirement to compound drugs solely for individuals with valid prescriptions. “As it [the bill] is worded, it excludes hospital pharmacies,” Miller said. “That is a problem because those hospital pharmacies are also engaged in compounding.”

IACP’s philosophy is that the entire pharmacy profession should be held to the same standards and should be accountable in the same manner. “Whenever you start making exemptions in the law, you are opening doors for problems,” Miller said. “That [exemption] is a real concern to us that there already is a real carve-out and carve-out is dangerous to patients.”

The National Community Pharmacists Association (NCPA) also has concerns with the VALID Compounding Act because it believes that the bill attempts to give the FDA authority over traditional pharmacy compounding. The bill requires that pharmacies, small or large, obtain a waiver from the FDA secretary to engage in anticipatory com-
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In ASHP’s prepared statement to the Senate Health, Education, Labor, and Pensions Committee on November 15, Kasey Thompson, vice president of Policy, Planning and Communications for ASHP, said that traditional compounding should continue to be regulated by state boards of pharmacy while “large-scale compounding of sterile products may require oversight by the FDA in cooperation with state boards of pharmacy.”

According to Thompson, greater communication and collaboration among state boards of pharmacy and the FDA are needed. When an entity is suspected of engaging in large-scale production, state boards of pharmacy will need to work with the FDA to conduct inspections. “We strongly believe that FDA must be provided the resources it needs to perform serious and meaningful oversight of entities that are potentially engaged in manufacturing. Not to do so now will only hinder the agency in implementing legislation,” Thompson said in his statement.

The American Pharmacists Association (APhA) offered its expertise to the Senate Health, Education, Labor, and Pensions Committee in correspondence to answer questions to stakeholders regarding appropriate regulations of pharmacy compounding. In a letter on November 1, Thomas Menighan, BS Pharm, MBA, the executive vice president and CEO of APhA, explained the association’s policy on compounding and the need for standards and an accreditation process to promote those standards. Menighan also expressed his concern that a lack of resources for the FDA and the Massachusetts Board of Pharmacy contributed to lack of enforcement and patient safety issues.

“Due to budgetary constraints, we see many state boards without the resources to conduct even cursory inspections of pharmacies, let alone having the expertise to inspect specialized facilities that prepare sterile products,” Menighan said. “We support increased resources for state boards and the FDA to enforce existing laws.”

APhA does believe that the Markey legislation could help to clarify the lines between compounding and manufacturing. said Menighan. “There are provisions in [the bill] that pharmacy might find a little bit challenging, but, at the end of the day, I think pharmacy collectively with a capital ‘P’—beyond APhA—is going to be very supportive of strong regulation and oversight of manufacturing and a clear definition of manufacturing and compounding,” Menighan said. “We want the public protected as much as our legislators do. We are health professionals first and foremost, and we care about our patients.”
Nearly half of all the patients were on 10 or more different medications, which is why pharmacist involvement and intervention was necessary, according to Thompson. All patients’ medications were reconciled upon both admission and discharge, and patients in the tier 3 group received a follow-up MTM visit with one of HCMC’s pharmacists within five days of discharge. “We look at patients who have the highest pharmacy spend, find out why that is, and determine how we can help reduce those costs,” Thompson said.

When Medicaid patients visited any of the health system’s clinics, pharmacists provided MTM services there. “Clinics would notify our MTM group if the patient did not pick up a prescription, for example,” Thompson said.

The 2011 ACO project was extremely successful. After a year, HCMC reduced hospital admissions by 42%, reduced ER visits by 37%, and reduced the cost of care by an average of $2,500 per patient. “We had 8,000 patients, so we reduced costs by $24 million,” Thompson said.

As a result, the Minnesota Department of Human Services, which operates Medicaid, funded HCMC for a second ACO project starting in January 2012. In the current project, HCMC is working with pharmacy benefit managers (PBMs), a challenging process, said Thompson, as their business model differs from the typical ACO model. “The PBM industry has looked at the cost of drug, regardless of cost of care. If the PBM industry doesn’t change, they could be our next dinosaur.”

The ACO model teaches pharmacists and other healthcare providers how to provide quality care while reducing costs, Thompson said. In this year’s ACO project, HCMC’s pharmacy budget is $140 per patient per month.

Clinical pharmacists are key
Because clinical pharmacists are essential to the success of ACOs, HCMC has increased the number of clinical pharmacists from four in 2008 to around 20 currently. Because of the positive results realized at certain HCMC clinics, “more and more of our pharmacists are going into our clinics. We have about 55 clinics, and have pharmacists — some full-time and some part-time — in about 20 of them,” Thompson said.

Christine Blank is a freelance writer based in Lake Mary, Fla.
FDA approves drug for chronic idiopathic constipation and IBS with constipation

On August 30, 2012, FDA approved linaclotide (Linzess, Ironwood Pharmaceuticals and Forest Pharmaceuticals) for the treatment of chronic idiopathic constipation and irritable bowel syndrome (IBS) with constipation in adults. Approximately 63 million people are affected by chronic constipation, according to the National Institutes of Health. For those individuals who experience persistent constipation and do not respond to standard therapy, they are diagnosed with chronic idiopathic constipation. IBS affects about 15.3 million people. IBS with constipation, a subtype of IBS, is characterized by abdominal pain and hard or lumpy stools at least 25% of the time and loose or watery stools less than 25% of the time.

Linaclotide has been approved with a black-box warning that the drug should not be prescribed for patients 17 years of age and younger due to deaths observed in animal studies.

Efficacy
Linaclotide for the management of chronic idiopathic constipation was evaluated in two double-blind, placebo-controlled, randomized, multicenter clinical trials in adults. In the two trials, 1,272 patients received linaclotide 145 µg, 290 µg, or placebo once daily for 12 weeks. Results of patients taking linaclotide showed significantly greater improvements compared with placebo in both stool frequency and consistency (increased response by 9.9% to 16.9%). In addition, the 290-µg dose did not offer additional clinical benefit compared with the 145-µg dose. Therefore, linaclotide 145 µg is the recommended dose.

Linaclotide for the management of IBS with constipation was also evaluated in two double-blind, placebo-controlled, randomized, multicenter trials in adults. In these two trials, 1,604 patients were randomly assigned to receive 290 µg of linaclotide or a placebo for 12 weeks. In both trials, patients receiving linaclotide had a significantly higher response rate (increase in response of 7% to 9.7%) in terms of reduced abdominal pain and complete spontaneous bowel movements than placebo-treated patients.

Safety
In the clinical trials for patients with chronic idiopathic constipation, the most common adverse reactions reported in at least 2% of patients receiving 145-µg dose of linaclotide were diarrhea (16%), abdominal pain (7%), flatulence (6%), abdominal distension (3%), upper respiratory tract infection (5%), and sinusitis (3%). Five percent of the linaclotide-treated patients who discontinued therapy did so due to diarrhea compared to 1% in the placebo group. In clinical trials for patients with IBS with constipation, the most common adverse reactions reported in at least 2% of patients receiving 290 µg of linaclotide were diarrhea (20%), abdominal pain (7%), flatulence (4%), abdominal distension (2%), viral gastroenteritis (3%), and headache (4%). Nine percent of patients who received linaclotide discontinued use, most commonly due to diarrhea (5%) and abdominal pain (1%), whereas 3% of the placebo group and less than 1% of all cases withdrew due to diarrhea and abdominal pain.

According to a boxed warning, linaclotide should not be used in patients 17 years of age and younger and the drug is contraindicated in pediatric patients up to the age of 6 years. In nonclinical studies, young juvenile mice died within 24 hours after receiving one or two daily oral doses of linaclotide. Although there were no deaths in older juvenile mice, the drug should be avoided in pediatric patients from 6 to 17 years of age, according to the package insert.

Dosing
The recommended dose of linaclotide for chronic idiopathic constipation is 145 µg by mouth once daily, while the dose for IBS with constipation is 290 µg by mouth once daily. It should be taken on an empty stomach, at least half an hour before the first meal of the day. The oral capsule should be swallowed whole, not broken or chewed.

Diana M. Sobieraj, PharmD, is assistant professor of Pharmacy Practice, University of Connecticut School of Pharmacy, Storrs, Conn.
Retail pharmacists find opportunity in the growing medical food market

Do you know medical foods? Most community pharmacists don’t. Medical foods are widely used in hospitals and long-term-care facilities. But they are just starting to move into ambulatory care and community pharmacy.

“Medical foods are products to be taken orally under a physician’s prescription,” said Candy Tsourounis, PharmD, professor of clinical pharmacy in the Medication Outcomes Center at the University of California San Francisco School of Pharmacy. “Medical foods are meant for the dietary management of a specific health issue. They are not at all related to dietary supplements.”

The only similarity between dietary supplements and medical foods is that FDA regulates both as foods. Dietary supplements are consumer products intended for use by normal, healthy adults to maintain good health and regular function, said Richard Isaacson, MD, assistant professor of neurology and medicine at the University of Miami Miller School of Medicine in Miami, Fla. Supplements can advertise health benefits but cannot claim to cure or mitigate disease.

Supporting health claims
Medical foods must make health claims and must provide clinical evidence to support those claims. According to FDA, the category includes nutritionally complete formulas such as enteral feeding products, nutritionally incomplete products that can be combined for balanced nutrition, formulas to treat metabolic disorders, and oral dehydration products.

“As an Alzheimer’s clinician, I am happy to see medical foods formulated to provide clinical nutritional support for my patients,” Isaacson said. “Medical foods can help improve symptoms and slow the progression of disease. In many cases, they are complementary to pharmacologic therapies.”

Medical foods were regulated as drugs until 1972, when they were reclassified as foods. The current definition of medical foods dates from the Orphan Drug Amendments enacted in 1988. From FDA’s perspective, a drug cures, treats, or mitigates the effects or symptoms of a specific disease. A medical food manages a specific disease or condition for which distinctive nutritional requirements, based on recognized scientific principles, are established by medical evaluation.

“The lack of understanding of the differences between drugs, medical foods, and dietary supplements can be a significant issue,” said Edward R. Blonz, PhD, assistant clinical professor of nutrition at UCSF. “You are looking at a food that is processed in such a way that it affects the underlying pathology of a disease. Medical foods should only be dispensed out of a pharmacy at the express direction of a physician.”

Most retail pharmacies have never handled medical foods. But that is starting to change. More manufacturers are bringing more products to market that address the metabolic processes that underlie Alzheimer’s disease (Axona, Accera Inc.), osteopenia/osteoporosis (Fosteum, Primus Pharmaceuticals), osteoarthritis (Limbrel, Primus), depression (Deplin, Pamlab), sleep disorders associated with depression (Sentra PM, Targeted Medical Pharma), pain and inflammation (Theramine, Targeted Medical Pharma), and ulcerative colitis and irritable bowel syndrome (VSL#3 probiotic medical food, Sigma-Tau Pharmaceuticals).

The size of the medical food market is unclear. FDA predicts strong growth, in light of the increasing use of medical foods in long-term care and the growing population of older individuals.

Acceptance by third-party payers
A growing body of clinical trial results is bolstering acceptance of medical foods in ambulatory care by third-party payers. Targeted Medical Pharma has published peer-reviewed trials showing statistically significant advantages for Theramine vs. naproxen for low back pain and Sentra PM plus trazodone vs. trazodone in the management of sleep disorders.¹²

“We are beginning to ship directly to retail pharmacies as prescription volume picks up and PBMs are covering our products,” said William Shell, MD, CEO and chief scientific officer of medical foods maker Targeted Medical Pharma.

“We are getting significant acceptance based on our clinical data. We go through the same scientific training for pharmacists as for physicians, because we recognize that pharmacists are the go-to health professionals for most people. As physicians have less and less time with patients, the educational role has increasingly fallen to pharmacists. Pharmacists have a critical role in educating patients about the risks and benefits of different medications.”

References

Fred Gebhart is a freelance writer based in San Francisco.
EDUCATIONAL OBJECTIVES

Goal: To discuss the place in therapy, efficacy, adverse events, administration, and patient education for insulin therapy for the management of diabetes.

After participating in this activity, pharmacists will be able to:
- Explain the place in therapy of insulin in the management of type 1 and type 2 diabetes
- Compare the different types of insulin
- Identify patients at increased risk for insulin-induced hypoglycemia
- Describe strategies to minimize and/or treat insulin-induced hypoglycemia, including patient education points
- Select insulin administration aids according to patient characteristics

Insulin therapy for diabetes care management

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Abstract

Effective management of both type 1 and type 2 diabetes requires that patients be prescribed the most effective pharmacologic therapy to achieve glycemic control. Insulin therapy achieves this objective and has been shown to decrease the risk of microvascular complications of diabetes in both type 1 and type 2 patients. The most feared adverse reaction of insulin among patients and clinicians alike is hypoglycemia, which may range from mild to severe. Careful selection of the insulin regimen, taking into account its pharmacokinetic properties, the patient’s risk factors for hypoglycemia, and the patient’s preferences, as well as frequent patient monitoring and comprehensive patient education are needed to achieve optimal therapeutic outcomes.

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Dr. Dang is associate clinical professor, University of Connecticut School of Pharmacy, Storrs, Conn. Faculty Disclosure: Dr. Dang has no actual or potential conflict of interest associated with this article. Disclosure of Discussions of Off-Label and Investigational Uses of Drugs: This activity may contain discussion of unlabeled/unapproved use of drugs. The content and views presented in this educational program are those of the faculty and do not necessarily represent those of Drug Topics or University of Connecticut School of Pharmacy. Please refer to the official prescribing information for each product for discussion of approved indications, contraindications, and warnings.
In normal physiology, glucose homeostasis is maintained through the interaction between hepatic glucose production, peripheral glucose utilization, and insulin as well as counterregulatory hormones such as glucagon and epinephrine. Insulin is secreted by pancreatic beta cells in response to an increase in plasma glucose concentration. It then regulates glucose utilization and metabolism by stimulating glucose uptake by skeletal muscle, liver, and adipocytes; promoting glycogen synthesis by the liver and suppressing hepatic gluconeogenesis; and stimulating lipogenesis and protein synthesis and inhibiting lipolysis.

Insulin therapy is clearly indicated in hyperglycemic crises such as diabetic ketoacidosis or hyperosmolar hyperglycemic state and in the management of type 1 diabetes mellitus. Not surprisingly, insulin is the only pharmacologic treatment option able to achieve glycemic control and therapeutic goals in the management of type 1 diabetes. The Diabetes Control and Complications Trial (DCCT) demonstrated that intensive insulin therapy with 3 or more daily injections or an insulin pump reduced the risk of developing retinopathy, nephropathy, and clinical neuropathy by 76%, 39% to 54%, and 60%, respectively, compared with less-intensive “conventional” insulin therapy (once- or twice-daily injections).

Long-term follow-up of the DCCT study, the Epidemiology of Diabetes Interventions and Complications (EDIC) study, demonstrated that patients in the intensive insulin therapy arm experienced a reduction from 72% to 87% in the risk of worsening retinopathy, 53% to 86% in the risk of nephropathy, and 42% in the risk of any cardiovascular disease event compared to the conventional insulin therapy group. Insulin therapy is clearly indicated for type 1 diabetes patients given the absolute insulin deficiency of these patients.

When to initiate insulin therapy in type 2 diabetes patients, however, is still a source of confusion and debate among clinicians. The 2012 position statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) on the management of hyperglycemia in type 2 diabetes recommends that insulin therapy be started in the following scenarios:

- Start insulin as initial therapy when the A1C is 10% or higher.
- Insulin, or combination therapy with 2 noninsulin medications, can be “justified” as initial therapy when the A1C is 9% or higher.
- Add basal insulin to initial monotherapy with noninsulin medication if unable to achieve glycemic goal with initial monotherapy after approximately 3 months.
- Add insulin as the third medication when dual therapy with 2 noninsulin medications (metformin plus a sulfonylurea, thiazolidinedione [TZD], dipeptidyl peptidase-4 [DPP-4] inhibitor, or glucagon-like peptide-1 [GLP-1] agonist) does not achieve glycemic control, especially when A1C is 9% or higher.

The ADA/EASD position statement places a strong emphasis on individualization of therapy, advocating a patient-centered approach by taking into account patient preference in treatment decisions. In 2009, the American Association of Clinical Endocrinologists/American College of Endocrinology (AACE/ACE) Glycemic Control Algorithm Consensus Panel developed an algorithm for type 2 diabetes that recommends insulin initiation for the following scenarios:

- when the A1C is greater than 9% in drug-naïve patients who are symptomatic.
- when triple therapy with noninsulin medications does not achieve glycemic goal.
- when the A1C is greater than 8.5% to 9% in patients not achieving glycemic goal with treatment with 2 noninsulin medications.

The AACE/ACE’s goal for glycemic control is 6.5% or lower, whereas the ADA/EASD’s goal is lower than 7%. See Figure 1 in the November Drug Topics article in this diabetes certificate series for the full type 2 diabetes glycemic control algorithm for AACE/ACE.

The efficacy of insulin therapy in preventing microvascular complications in type 2 diabetes patients was first demonstrated in the landmark United Kingdom Prospective Diabetes CPE Series
Diabetes Study (UKPDS). UKPDS showed that newly diagnosed type 2 diabetes patients treated with an intensive regimen of either a sulfonylurea or insulin over 10 years reduced the risk of microvascular end points (mostly retinopathy) by 25% compared to conventional treatment with dietary therapy. No significant difference was seen in the risk of development of macrovascular complications. The A1C achieved by the intensive treatment group was 7% compared to 7.9% by the dietary therapy group. These treatment groups were followed up for another 10 years after the original study ended. The diabetes treatment choice was no longer dictated by study protocol during this post-study follow-up. Even though between-group differences in A1C were lost after the first year of follow-up, the benefit of risk reduction in microvascular complications persisted in the intensive treatment group (24% risk reduction in microvascular disease). The intensive treatment group also had a significantly lower risk of myocardial infarction (15%) and death from any cause (13%) as well as any diabetes-related end point (9%) compared to the original dietary therapy group. Of note, UKPDS showed that on average 44% of beta-cell function has already been lost by the time type 2 diabetes is diagnosed and this declines progressively after diagnosis.

There is general agreement on what noninsulin diabetes medications to continue once insulin therapy has been started. Both the AACE/ACE and ADA/EASD recommend continuing metformin therapy because it does not add to the weight gain or hypoglycemia associated with insulin therapy. Sulfonylureas or nonsulfonylurea secretagogues can be continued at the beginning of insulin treatment when a small dose of basal insulin is used to minimize initial worsening of glycemic control, but these should be discontinued once prandial insulin has been added giving the additional risk of hypoglycemia and redundant mechanism of action. TZDs should generally be avoided, or at least their dose reduced, due to the risk of increased fluid retention, edema, and weight gain with concomitant insulin therapy. The ADA/EASD position statement acknowledges that some patients with large insulin dose requirements due to severe insulin resistance may benefit from continuation of TZD therapy given their insulin sensitizing effect, enabling a smaller dose of insulin.

Both GLP-1 agonists and DPP-4 inhibitors have been studied with concomitant insulin therapy, and all currently available DPP-4 inhibitors can be used in combination with insulin therapy. Package inserts for the GLP-1 agonists exenatide and lixisenatide warn that these drugs have not been studied in combination with prandial insulin. The dose of the basal insulin may need to be lowered when initiating therapy with incretin-based drugs to avoid increased risk of hypoglycemia.

Insulin therapy does not always have to be permanent in type 2 diabetes patients. In patients recently diagnosed with type 2 diabetes who need to start on insulin therapy, it is possible that treatment can reduce the adverse consequences of glucotoxicity and lipotoxicity on pancreatic beta-cell function. Understanding these important caveats: this is not a certain outcome in all patients, especially those with long-standing diabetes (eg, recently diagnosed but with significant hyperglycemia for several years) or who do not achieve adequate glycemic control on insulin (due to nonadherence or other reasons); and even if insulin therapy can be discontinued, patients will likely need to restart insulin at a later time due to the progressive nature of the condition.

**Insulin types**

Insulins are categorized based on pharmacokinetic properties. Available insulin types are bolus insulins (rapid-acting, short-acting), basal insulins (intermediate-acting, long-acting), and premixes. Insulin types are b bolus in sulins (rapid-acting, short-acting), basal insulins (intermediate-acting, long-acting), and premixes (Table 1, page 39). In persons without diabetes endogenous insulin is secreted at a constant rate. This basal rate of insulin secretion in response to a carbohydrate load and have the quickest onset of action of all currently available insulins. They should be administered no more than 15 minutes before a meal to avoid hypoglycemia. Patients should be educated to inject the insulin once they have food ready to eat, not when the food is anticipated, such as when placing an order at a restaurant. Rapid-acting insulins can also be administered up to 30 minutes after starting a meal or immediately after a meal. This flexibility is especially useful in patients who may not ingest the entire content of a meal, such as children, patients with gastroparesis, and those with nausea and vomiting because the dose injected can be adjusted based on what the person actually ate. Postprandial administration of the different rapid-acting insulin analogs has been studied in various populations: young children, teens, and adults, including pregnant women. The labeled administration directions for insulin glulisine allow it to be given within 20 minutes after starting a meal.

Regular human insulin is also a prandial insulin, but it is classified as short-acting instead of rapid-acting insulin because it has a slower onset of action as well as a prolonged duration of effect compared to rapid-acting analogs. Therefore it does not mimic normal endogenous prandial insulin
Various studies have demonstrated that the rapid-acting analogs result in better postprandial glycemic control and less postprandial hypoglycemia than regular human insulin. The AACE/ACE Glycemic Control Algorithm Consensus Panel on type 2 diabetes does not recommend the use of regular human insulin for this reason. Regular human insulin is no longer commonly prescribed as a prandial insulin. It is available as a generic, however, which is a viable option for those who need a more affordable prandial insulin than the rapid-acting analogs.

**Basal insulins.** The long-acting insulin analogs are insulin glargine and insulin detemir. Their duration of action is approximately 24 hours in most diabetes patients, enabling them to be administered once daily, although some patients do need twice-daily administration. Neutral protamine Hagedorn (NPH) insulin is classified as intermediate-acting insulin because its duration of action is approximately 10 to 16 hours, necessitating twice-daily injections to achieve 24-hour coverage. Multiple other advantages of long-acting insulin analogs over NPH insulin exist. NPH insulin has a pronounced peak in comparison to the relatively peakless profiles of insulin glargine and insulin detemir and a wider variability in absorption, even within the same patient from day to day. Improvements in A1C are similar with NPH insulin compared to long-acting insulins, but the risk of hypoglycemia, especially nocturnal hypoglycemia, is lower with insulin glargine and detemir than with NPH insulin. To prevent hypoglycemia during its long peak of effect, the patient may need to eat a snack in the late afternoon and before bedtime when taking twice-daily (before breakfast and dinner) NPH insulin, which can lead to weight gain. NPH insulin causes more weight gain than insulin detemir but not when compared to insulin glargine. The AACE/ACE Glycemic Control Algorithm Consensus Panel does not recommend the use of NPH insulin.

### TABLE 1

**INSULIN PREPARATIONS**

<table>
<thead>
<tr>
<th>Insulin preparations</th>
<th>Brand name</th>
<th>Type</th>
<th>Onset of action</th>
<th>Peak</th>
<th>Duration of action</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rapid-acting</strong> <em>(administer immediately before meal)</em></td>
<td>Humalog</td>
<td>Insulin lispro</td>
<td>5-15 min</td>
<td>0.5–1.5 hr</td>
<td>3-5 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NovoLog</td>
<td>Insulin aspart</td>
<td>5-15 min</td>
<td>0.5–1.5 hr</td>
<td>3-5 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apidra</td>
<td>Insulin glulisine</td>
<td>5-15 min</td>
<td>0.5–1.5 hr</td>
<td>3-5 hr</td>
<td></td>
</tr>
<tr>
<td><strong>Short-acting</strong> <em>(administer 30 min before meal)</em></td>
<td>Humulin R Novolin R</td>
<td>Regular human insulin</td>
<td>30–60 min</td>
<td>2-3 hr</td>
<td>5-8 hr</td>
<td>Available as generic</td>
</tr>
<tr>
<td><strong>Intermediate-acting</strong></td>
<td>Humulin N Novolin N</td>
<td>Isophane insulin suspension (NPH)</td>
<td>2-4 hr</td>
<td>4-10 hr</td>
<td>10-16 hr</td>
<td>Available as generic. Can be mixed with rapid-acting or short-acting insulin in same syringe for immediate administration</td>
</tr>
<tr>
<td><strong>Long-acting</strong></td>
<td>Lantus</td>
<td>Insulin glargine</td>
<td>2-3 hr</td>
<td>None</td>
<td>20-24 hr</td>
<td>Cannot be mixed in same syringe with other insulins</td>
</tr>
<tr>
<td></td>
<td>Levemir</td>
<td>Insulin detemir</td>
<td>1-2 hr</td>
<td>None</td>
<td>Dose-dependent 6-23 hr</td>
<td>Cannot be mixed in same syringe with other insulins.</td>
</tr>
<tr>
<td><strong>Premixes</strong></td>
<td>Humalog mix 75/25</td>
<td>75% lispro protamine suspension (NPL)/25% lispro</td>
<td>5-15 min</td>
<td>Dual</td>
<td>10-16 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NovoLog mix 70/30</td>
<td>70% protamine crystalline aspart/30% aspart</td>
<td>5-15 min</td>
<td>Dual</td>
<td>10-16 hr</td>
<td>Do not confuse with other “70/30” (NPH/reg) premix</td>
</tr>
<tr>
<td></td>
<td>Humulin 70/30 Novolin 70/30</td>
<td>70% NPH/30% regular</td>
<td>30-60 min</td>
<td>Dual</td>
<td>10-16 hr</td>
<td>Do not confuse with other “70/30” (protamine crystalline aspart/aspart) premix</td>
</tr>
<tr>
<td></td>
<td>Humalog mix 50/50</td>
<td>50% NPL/50% lispro</td>
<td>5-15 min</td>
<td>Dual</td>
<td>10-16 hr</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Refs 50 and 51

Pharmacokinetics properties assuming dose of 0.1–0.2 U/kg for all but insulin detemir. Peak and duration increase with increasing dose. For insulin detemir, duration of action ranges 5.7±0.6 h for 0.1 U/kg to 23.3±0.3 h for 1.6 U/kg.

In-use insulin vials should be discarded after 4 weeks for all insulins except insulin detemir, which can be discarded after 42 days.

**Abbreviations:** NPH, neutral protamine Hagedorn; NPL, neutral protamine lispro
Insulin detemir can require twice-daily admin-
istration at lower doses (Table 1). A new
ultra long-acting insulin, insulin degludec, is
awaiting FDA approval as of November 20.

**Premixed insulins.** Available premixes
contain either NPH insulin plus regular hu-
man insulin, or insulin aspart or insulin lis-
pro plus a protaminated version of these 2
rapid-acting insulins, combined in the same
vial or pen cartridge (Table 1). The premixes
have the advantages of less daily injections
twice daily) compared to a true basal-
bolus regimen with 3-times-daily rapid-
acting insulin plus once-daily basal insulin
analog. Premixes, especially the NPH/regu-
lar premix, however, do not mimic as closely
normal endogenous insulin secretions, and
dose adjustments are hampered by the fact
that the 2 insulin components must be in-
creased or reduced together. Patients who
wish to only inject twice daily but require
separate adjustments of the insulin doses
can be placed on the NPH and prandial in-
sulin separately and taught how to draw up
the 2 components into 1 syringe for injec-
tion immediately after mixing the insulins.

**General insulin dosing and titration strategies**

In type 2 diabetes patients, insulin therapy
is usually started by placing the patient on
a small dose of either 10 U or 0.1 to 0.2
U/kg insulin glargine or insulin detemir once
daily, titrating to the target fasting plasma
glucose.³³-³⁵ Alternative strategies to initi-
at ing insulin therapy include using premixed
insulin, NPH insulin, or prandial insulins.
The premixes can be started once daily
(prior to the largest meal of the day) and
another dose can be added at the second
largest meal, such as injecting prior to
breakfast and dinner.³ Substituting NPH
insulin, which is available as a generic, for
long-acting basal insulin is another strat-
ey, but this is generally reserved only for those
unable to afford the more-expensive insulin
glargin or insulin detemir given the higher
risk of hypoglycemia. NPH insulin can be
started once daily prior to dinner, and then
the second dose added prior to breakfast.
(In some patients, moving the predinner
NPH dose to bedtime administration may
reduce the risk of nocturnal hypoglycemia.)
Alternatively, initiating therapy with meal-
time administration of rapid-acting analogs
is a better option in patients with fasting
blood glucose at goal but with postprandial
hyperglycemia. Therapy can certainly be
initiated with 3-times-daily injections, but
many patients find it more acceptable to
start therapy with once-daily administration
with the biggest meal of the day, subse-
quently progressing to twice-daily and then
3-times-daily injections at meals. As stated
previously, regular human insulin is an al-
ternative to the rapid-acting insulin analogs
in patients unable to afford them but the
risk of postprandial hypoglycemia is greater.

due to its increased risk for hypoglycemia
as well as highly variable intrapatient and
interindividual absorption.⁵

The efficacy and hypoglycemia risk of in-
sulin detemir and insulin glargine is similar,
but insulin detemir appears to be associated
with less weight gain (~1-2 kg).²⁰-²² Injection
site reactions, in particular stinging, have
been reported as occurring more frequently
with insulin glargine compared to insulin
detemir (and NPH insulin), likely because
it has a more acidic pH compared to the
more physiologic pH of the other 2 insulins.²²

### Table 1

<table>
<thead>
<tr>
<th>Mean of last 3-day fasting self-monitoring of blood glucose</th>
<th>Dose adjustment</th>
<th>Pattern of mean blood glucose values below target</th>
<th>Pattern of mean blood glucose values above target</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;180 mg/dL</td>
<td>Increase by 8 U</td>
<td>Decrease to 1 U/25 g</td>
<td>Increase to 1 U/15 g</td>
</tr>
<tr>
<td>140-180 mg/dL</td>
<td>Increase by 6 U</td>
<td>Decrease to 1 U/20 g</td>
<td>Increase to 1 U/10 g</td>
</tr>
<tr>
<td>120-140 mg/dL</td>
<td>Increase by 4 U</td>
<td>Decrease to 1 U/15 g</td>
<td>Increase to 2 U/15 g</td>
</tr>
<tr>
<td>95-119 mg/dL</td>
<td>Increase by 2 U</td>
<td>Decrease to 2 U/15 g</td>
<td>Increase to 4 U/15 g</td>
</tr>
<tr>
<td>70-94 mg/dL</td>
<td>No change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;70 mg/dL</td>
<td>Decrease by same number of units as insulin glulisine increase that titration week or up to 10% of total insulin glargine dose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Conclusion**

Although insulin detemir and insulin glargine are similar in terms of efficacy and hypoglycemia risk, insulin detemir appears to have a lower risk of weight gain compared to insulin glargine. Additionally, insulin detemir can be administered twice daily at lower doses, which may be more convenient for patients. However, the increased risk of hypoglycemia and stinging at injection sites need to be considered when choosing the appropriate insulin therapy. Insulin glargine and insulin detemir are effective options for the management of type 2 diabetes, and the choice between the two should be based on individual patient needs and preferences.
In type 1 diabetes patients, the expected total daily requirement is 0.4 to 1 U/kg. The starting dose of the basal insulin portion is one-third of the total daily insulin requirement, with the remaining two-thirds of the total daily requirement taken care of with prandial insulin, as per the product labeling for both insulin glargine and insulin degludec. The doses can then be adjusted accordingly to achieve glycemic goal.

Dosing titration schema varies among clinicians but general patterns do exist. For the titration of long-acting basal insulins, several titration algorithms have been studied. Perhaps the most well known is from the Treat-to-Target study, which examined the efficacy and safety of a forced-titration algorithm for insulin glargine in type 2 diabetes patients. Rapid-acting analogs can be started at approximately either 5 U per meal or 7% of the total daily dose of basal insulin as per the AACE/ACE Glycemic Control Algorithm Consensus Panel. The dose can be titrated 2 to 3 U every 2 to 3 days based on the 2-hour blood glucose reading and also taking into account the blood glucose prior to the next meal or at bedtime (for predinner administration). Patients who are able to accurately count carbohydrates can be educated on how to match their prandial insulin dose to the carbohydrate content of each meal, enabling better flexibility in day-to-day meal choices. The Adjust-to-Target study compared 2 treatment strategies for adjusting insulin glulisine: either a fixed-dosing algorithm based solely on prelunch, predinner, and bedtime blood glucose levels or a more complex strategy utilizing carbohydrate counting with individualized insulin-to-carbohydrate ratio. Patients in this study were also taking insulin glargine and the doses were adjusted in a similar manner to the Treat-to-Target study. After 24 weeks of therapy, the A1C and rate of severe hypoglycemia were similar in both groups, but the doses were adjusted in a similar manner to clinical practice. For hypoglycemia unawareness, a term describing the fact that these patients do not experience symptoms when blood glucose reaches the range for hypoglycemia. These patients need frequent self-monitoring of blood glucose, especially if they are prescribed a multiple daily injection regimen. They are also good candidates for continuous glucose monitoring (CGM). Avoidance of hypoglycemia for at least a 2-3 week period can lead to reversal of hypoglycemia unawareness in many patients. Current treatment with sympatholytic drugs such as beta blockers, clonidine, and reserpine can mask the symptoms of hypoglycemia, so monitoring and patient education need to take this into account.

### Table 2
(Continued...)

<table>
<thead>
<tr>
<th>Risk Factors for Hypoglycemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regimen-related</td>
</tr>
<tr>
<td>• Intensive insulin regimen (multiple daily doses)</td>
</tr>
<tr>
<td>• Aggressive glycemic goal</td>
</tr>
<tr>
<td>• Higher doses of insulins</td>
</tr>
<tr>
<td>• Insulins with longer peaks and duration</td>
</tr>
<tr>
<td>• Concomitant other diabetes medications, esp. sulfonylurea, pramlintide, or nesulfonylurea secretagogues</td>
</tr>
<tr>
<td>Patient-related</td>
</tr>
<tr>
<td>• Advanced age</td>
</tr>
<tr>
<td>• Decreased carbohydrate intake in comparison to insulin dose</td>
</tr>
<tr>
<td>• Erratic meal schedule or missed meal(s)</td>
</tr>
<tr>
<td>• Exercise</td>
</tr>
<tr>
<td>• History of hypoglycemia</td>
</tr>
<tr>
<td>• Alcohol intake</td>
</tr>
<tr>
<td>• Renal dysfunction (decreased insulin clearance)</td>
</tr>
<tr>
<td>• Hepatic dysfunction (decreased gluconeogenesis)</td>
</tr>
<tr>
<td>• Having type 1 diabetes</td>
</tr>
<tr>
<td>• Error in insulin administration (injecting incorrect dose, waiting &gt;15 min to eat after injecting rapid-acting insulin)</td>
</tr>
</tbody>
</table>

Hypoglycemia

Hypoglycemia is often the most feared complication of insulin therapy by prescribers and patients alike. Hypoglycemic symptoms include hunger, tachycardia, shakiness/tremors, nervousness, sweating, and skin tingling or numbness. More significant symptoms develop as the blood glucose declines and include neuroglycopenic changes such as weakness, dizziness, headache, confusion, difficulty concentrating, lethargy, and irritability or other behavioral changes. Left untreated, severe hypoglycemia may progress to seizure, loss of consciousness, coma, and death. Severe hypoglycemia is defined as an episode during which the patient requires the assistance of another person. Risk factors for hypoglycemia are listed in Table 3.

Hypoglycemic symptoms typically present when plasma glucose concentration reaches approximately 50 to 55 mg/dL. Thresholds at which symptoms are experienced, however, vary among diabetes patients. In addition, those with uncontrolled hyperglycemia may experience symptoms at higher plasma glucose concentration, whereas those on intensive diabetes treatment regimens, especially those on multiple daily insulin injections, who experience frequent hypoglycemia may experience symptoms at lower glucose concentration. The ADA’s cut-off value for hypoglycemia that prompts corrective treatment is lower than 70 mg/dL.

Patients with frequent hypoglycemia or with diabetic autonomic neuropathy may exhibit hypoglycemia unawareness, a term describing the fact that these patients do not experience symptoms when blood glucose reaches the range for hypoglycemia. These patients need frequent self-monitoring of blood glucose, especially if they are prescribed a multiple daily injection regimen. They are also good candidates for continuous glucose monitoring (CGM). Avoidance of hypoglycemia for at least a 2-3 week period can lead to reversal of hypoglycemia unawareness in many patients. Current treatment with sympatholytic drugs such as beta blockers, clonidine, and reserpine can mask the symptoms of hypoglycemia, so monitoring and patient education need to take this into account.

### Education on treatment and prevention of hypoglycemia

Patient education about hypoglycemia should start with an explanation of its signs and symptoms, which need to be person-
mimic inebriation. (It is especially important for patients prescribed insulin to avoid alcohol ingestion.) These individuals should know how to treat hypoglycemia, including administering glucagon if this medication is prescribed for the patient. Glucagon is secreted by pancreatic alpha cells and stimulates glycogenolysis by the liver. Glucagon is typically prescribed for patients at risk for severe hypoglycemia. Glucagon should be administered only when the patient is unconscious, cannot swallow, or otherwise unable to self-treat the hypoglycemia. The glucagon needs to be reconstituted and then injected subcutaneously, intramuscularly, or even intravenously. The patient should be placed on their side to minimize the chance of choking given that nausea and vomiting may occur when they awaken. Once the patient is awake and able to swallow, they should be given supplemental carbohydrates to restore liver glycogen. If the unconscious patient does not respond to glucagon or glucagon is not available then 911 should be called. Patients prescribed glucagon should be taught to always carry it with them. Additionally, anyone with diabetes, and especially those on insulin or with hypoglycemia unawareness, should consider wearing a medical alert bracelet.

**Prevention**

The threshold blood glucose concentration for hypoglycemia that prompts corrective self-treatment should be individualized for each patient, depending on their risk. For example, patients with hypoglycemia unawareness or multiple risk factors for hypoglycemia may be safer with a higher blood glucose cut-off for treatment than that of lower than 70 mg/dL. Patients with frequent hypoglycemia episodes and those with multiple risk factors for hypoglycemia or complications of hypoglycemia such as falls may require less stringent glycemic goals for A1C and self-monitoring of blood glucose readings. Patients with multiple risk factors for hypoglycemia or those with hypoglycemia unawareness require more frequent self-monitoring of blood glucose, including before driving or operating heavy machinery and during periods of increased physical activity. All patients should be educated about any risk of hypoglycemia that exists for their particular diabetes medication regimen.

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### TABLE 4

**INSULIN ADMINISTRATION ACCORDING TO PATIENT CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Delivery method</th>
<th>Ease of operation and administration</th>
<th>Administration considerations</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vial and syringe</td>
<td>More difficult than insulin pens. Markings on syringes are small and difficult to see for visually impaired.</td>
<td>Available in 30-unit, 50-unit, and 100-unit syringes</td>
<td>$ for NPH and regular insulins and their analogs</td>
</tr>
<tr>
<td>Insulin pen</td>
<td>Disposable pens are easier than reusable pens. Both types are easier than vial and syringe method.</td>
<td>Maximum of 60 or 80 units delivered per injection, depending on manufacturer. Not available for U-500 insulin.</td>
<td>$$$</td>
</tr>
<tr>
<td>Jet injectors</td>
<td>More administration steps than vial and syringe and pen methods. Extensive cleaning required for nondisposable injectors.</td>
<td>Bruising may occur if incorrectly administered.</td>
<td>$$$</td>
</tr>
<tr>
<td>CSII pumps</td>
<td>Require extensive initial and ongoing training. Require changing of infusion set every 48-72 hr.</td>
<td>Continuous infusion</td>
<td>$$$</td>
</tr>
</tbody>
</table>

$ = least expensive to $$$$ = most expensive. Cost may vary based on insurance status.

Abbreviations: CSII, continuous subcutaneous insulin infusion; NPH, neutral protamine Hagedorn.

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alized to each patient because symptoms vary from person to person. All patients prescribed hypoglycemic medications should be taught to always carry a fast-acting, readily absorbable source of sugar with them. A detailed explanation of the proper way to treat hypoglycemia if it does occur should include details on exactly how much carbohydrate to ingest so that the patient does not ingest too little or too much. Patients should be taught the “rule of 15”: ingest 15- to 20-g carbohydrate, wait 15 minutes, then check blood glucose (or see if symptoms have resolved if glucose meter is not available). The treatment can be repeated with another 15-g of carbohydrate if blood glucose is still lower than 70 mg/dL and blood glucose rechecked 15 minutes later. Fast-acting sources of carbohydrate that contain 15 g of carbohydrate include 4 ounces of fruit juices or regular (not diet) soda, 8 ounces of skim milk, and 5 to 6 Life Savers candies. Glucose tablets, gel, and liquid are the preferred means to treat hypoglycemia and are easier to carry than other sources of carbohydrate. They vary in amount per serving, but typically each glucose tablet contains 4- to 5-g of glucose. Regardless of the type of food ingested, the patient should follow the initial fast-acting treatment with additional food once the hypoglycemia episode has resolved to avoid recurrence. If it occurs close to the patient’s next meal that meal can be eaten, with the patient ingesting the regular amount of food for that meal and not more, as overtreatment may result in subsequent hyperglycemia. Insulin therapy is associated with a 4- to 5-kg weight gain that is partly due to overtreatment of hypoglycemia. In patients taking an alpha-glucosidase inhibitor who experience hypoglycemia due to concurrent insulin or sulfonylurea therapy, only glucose (eg, glucose tablets, gel, or liquid) should be ingested because these medications reduce and delay the absorption of complex carbohydrates.

Family, caregivers, friends, coworkers, and others such as teachers and sports coaches of diabetes patients should also be taught how to recognize symptoms of hypoglycemia. One particularly crucial education point should be that some of the neuroglycopenic symptoms of hypoglycemia can occur before or even without hypoglycemia being present. Insulin and medication initiation points should be that some of the neuroglycopenic symptoms of hypoglycemia can occur before or even without hypoglycemia being present. Insulin and medication initiation points should be that some of the neuroglycopenic symptoms of hypoglycemia can occur before or even without hypoglycemia being present. Insulin and medication initiation points should be ever more frequent self-monitoring of blood glucose, including even before driving or operating heavy machinery and during periods of increased physical activity. All patients should be educated about any risk of hypoglycemia that exists for their particular diabetes medication regimen.
Those on insulin therapy should understand the general time action profile(s) of their insulin(s), especially when hypoglycemia risk would be greatest, such as when there is a mismatch between meal content or timing and the insulin, as well as during and after exercise. The ADA recommends that those on insulin, or insulin secretagogues, ingest additional carbohydrates if blood glucose is lower than 100 mg/dl before engaging in exercise.41 Eating snacks (late afternoon and bedtime) is often needed for those on twice-daily premixes or NPH plus regular insulin regimens to avoid hypoglycemia. Adjustment of the insulin regimen (changing the dose or switching from regular human insulin to rapid-acting insulin or from NPH insulin to a long-acting insulin) and/or concurrent noninsulin diabetes medication(s) are additional strategies to prevent hypoglycemia. All patients should learn not only how to self-monitor for hypoglycemia but also how to problem-solve to prevent its occurrence.

**Insulin administration**

Subcutaneous administration of insulin is accomplished via the vial and syringe method or with insulin pens. The vial and syringe method is commonly prescribed in the United States, but insulin pens are associated with better ease of use, accuracy, and patient satisfaction.42 These pens are also more convenient to carry and should preferentially be recommended unless cost is a factor. Regardless of the method utilized, pharmacists should provide patient education and monitoring about proper administration techniques as some patients, particularly in the beginning of insulin therapy, may find insulin injection difficult. Subcutaneous insulin should be injected into either the abdomen, the outer thighs, upper buttocks, or back of the upper arms. Patients should be advised to rotate injection sites to avoid lipohypertrophy. Because insulin absorption rates vary among sites, rotation within 1 site is recommended instead of rotating from site to site to avoid wide variability in blood glucose.43 Insulin absorption is fastest with abdominal subcutaneous fat, so this area should be reserved as the site for administration of prandial insulin for patients on a bolus-basal regimen. Patients should avoid injecting in the area within 2 inches of the navel as well as injecting near moles or scars as absorption in these areas is less predictable.

Insulin can also be delivered by jet injectors and by continuous subcutaneous insulin infusion (CSII) pumps. Jet injectors deliver insulin through the skin via a high-pressure stream and therefore do not require a needle. On the surface, these seem to be an attractive option for those with needle phobia. The injection can be more painful than with needles, however, and bruising may occur. CSII pumps deliver rapid-acting insulin via continuous subcutaneous infusion. A basal rate can be programmed, with adjustments for different periods such as exercise and sleep, and as-needed boluses administered according to carbohydrate content of meals/snacks. This administration method is the one currently available that comes closest to normal pancreatic insulin secretion and some advantages include a lower risk of hypoglycemia and more flexibility in meal and activity schedule than with the multiple daily injection method.44 Insulin pump therapy does require a highly motivated and educated patient along with a full supporting team of diabetes specialists including pump trainers, diabetes educators, and dieticians. An extensive comparison of the methods of insulin administration is beyond the scope of this article. **Table 4 (page 42)** provides additional basic information for each method.

**Insulin administration aids**

A variety of injection aids are available for patients administering insulin via the vial and syringe method. These are especially useful for those with limited manual dexterity as well as visual impairment. Such injection aids include syringe magnifiers and stabilizers, spring-loaded devices that aid in the actual injection, and devices for handling the vials. More information about these assistive devices is available in the May 15, 2012, Drug Topics article on helping patients with diabetes and visual or manual impairment.45

For patients prescribed multiple daily injection regimens, the use of injection ports can minimize the number of actual injections. Injection ports contain a soft, flexible cannula that is inserted into the subcutaneous fat and remains in place for up to 72 hours. The patient injects the insulin by either syringe or insulin pen via the port above the surface of the skin. Because multiple injections can be done through the port, the number of skin punctures is greatly reduced, for example, going from 120 skin punctures to 10 punctures per 30 days for a patient on a regimen of once-daily basal insulin plus 3-times-daily prandial insulin.46

**Conclusion**

Insulin therapy is a vital component of not only the management of type 1 diabetes but also that of type 2 diabetes. The choice of insulin regimen should be based on that which most closely mimics endogenous insulin secretion, has the lowest risk of hypoglycemia, and is the easiest for patients to administer, all the while taking into account the patient’s personal preferences to achieve a patient-centered approach to diabetes care. •

**Pause & Ponder**

A 77-year-old patient has been taking a regimen of twice-daily premix of NPH and regular human insulin. The patient has type 2 diabetes, diabetic neuropathy and retinopathy, long-standing uncontrolled hypertension, osteoarthritis, hearing impairment, osteoporosis, and atrial fibrillation requiring anticoagulation therapy. What risk factors put this patient at increased risk of hypoglycemia and its consequences?
TEST QUESTIONS

1. Pharmacologic actions of insulins include:
   a. Inhibiting lipogenesis
   b. Increasing hepatic gluconeogenesis
   c. Inhibiting hepatic glycogen synthesis
   d. None of the above

2. According to the 2009 AACE/ACE consensus statement and algorithm for glycemic control in type 2 diabetes, insulin therapy should be initially considered in which of the following scenarios?
   a. In a drug-naïve patient when A1C is greater than 9% and the patient is symptomatic
   b. After the patient has already been taking triple therapy regimens with noninsulin diabetes medications for 2-3 months but still uncontrolled
   c. When the A1C is greater than 8.5% to 9% in patients not achieving glycemic goal with treatment with 2 noninsulin medications
   d. All of the above

3. The UKPDS showed that, at diagnosis, what percent of pancreatic beta-cell function has already been lost in patients with type 2 diabetes?
   a. 10%
   b. 25%
   c. 44%
   d. 70%

4. What noninsulin medication would be beneficial to the ideal insulin regimen for the management of diabetes should:
   a. Metformin
   b. Thiazolidinediones
   c. Meglitinides
   d. None of the above

5. The peak of NPH insulin's action occurs between:
   a. 2-3 hours
   b. 4-6 hours
   c. 4-10 hours
   d. 10-18 hours

6. The difference(s) between rapid-acting insulin analogs and short-acting regular human insulin is/are:
   a. The onset, peak, and duration of action
   b. Rapid-acting insulin analogs are given for postprandial hyperglycemia and regular human insulin is given for fasting hyperglycemia
   c. Rapid-acting insulin analogs cause more hypoglycemia than regular human insulin
   d. None of the above

7. The “rule of 15” to treat hypoglycemia includes:
   a. Ingest 15 g of a rapid-acting source of glucose/carbohydrate, wait 15 minutes, then ingest another 15 g of glucose/carbohydrate if blood glucose is still <70 mg/dL

8. Which of the following insulins is associated with the greatest risk of hypoglycemia?
   a. Insulin detemir
   b. Insulin glargine
   c. NPH insulin
   d. All of the above

9. The 2009 AACE/ACE consensus statement and algorithm for glycemic control in type 2 diabetes does not recommend the use of which insulins(s)?
   a. NPH and regular human insulin
   b. NPH and insulin lispro
   c. Insulin detemir
   d. Regular human insulin only

10. A primary care physician would like to start a 30-year-old type 2 diabetes patient on insulin glulisine 5 units 3 times daily before meals and asks for your opinion. What recommendation(s) would you provide?
    a. Prescribe the insulin in the form of a pen as these lead to better ease of use, administration accuracy, and patient acceptability
    b. The patient should be educated that she/he should inject the insulin no more than 15 minutes prior to eating a meal or within 20 minutes after starting a meal
    c. The patient should be educated that she/he should skip a dose if she/he skip a meal
    d. All of the above

11. Which of the following are risk factors for hypoglycemia in a patient on insulin therapy?
    a. Inconsistent meal schedule
    b. Advanced age
    c. Impaired renal function
    d. All of the above

14. One difference between insulin glargine and insulin detemir is that:
    a. Insulin glargine is an intermediate-acting insulin whereas insulin detemir is a long-acting insulin
    b. The rate of injection site reaction is higher with insulin glargine than with insulin detemir
    c. Insulin glargine is generic and insulin detemir is not
    d. There are no differences between the 2 insulins

15. The 2009 AACE/ACE consensus statement and algorithm for glycemic control in type 2 diabetes does not recommend the use of which insulins(s)?
    a. NPH and regular human insulin
    b. NPH and insulin lispro
    c. Insulin detemir
    d. Regular human insulin only

16. Compared to long-acting insulins, NPH insulin:
    a. Has a shorter duration of action
    b. Causes more hypoglycemia, especially nocturnal hypoglycemia
    c. Has more variability in absorption
    d. All of the above

17. Fast-acting sources of 15-g carbohydrate that can be recommended to treat hypoglycemia include:
    a. 8 ounces of diet soda
    b. 4 ounces of fruit juices
    c. 4 ounces of skim milk
    d. 1 glucose tablet

18. Which of the following insulin administration methods requires the most training but mimics normal endogenous insulin secretion the closest?
    a. Pen administration
    b. Vial and syringe
    c. Continuous subcutaneous insulin infusion
    d. Jet injectors

19. Patients with hypoglycemia unawareness:
    a. Are very sensitive to changes in blood glucose and feel symptoms of hypoglycemia more often than other patients
    b. Require more frequent self-monitoring of blood glucose than patients without this condition
    c. Can ingest a moderate amount of alcohol
    d. Do not need to carry a fast-acting source of carbohydrate with them

20. What is the blood glucose reading that should prompt treatment for hypoglycemia according to the ADA?
    a. <70 mg/dL
    b. <130 mg/dL
    c. <100 mg/dL
    d. <80 mg/dL
References


Women who regularly took the analgesics ibuprofen or acetaminophen 2 or more days per week had an increased risk of hearing loss, according to a study published in the September 15, 2012 issue of the *American Journal of Epidemiology*.

Hearing loss is an extremely common and often disabling chronic condition. In the United States, up to one-third of women in their 50s and two-thirds of women in their 60s have some degree of hearing loss. This study of more than 60,000 women participants in the Nurses’ Health Study II is the first large prospective study of the relationship between regular use of these analgesics and the risk of hearing loss in women. Researchers at Brigham and Women’s Hospital (BWH) in Boston followed the participants for 14 years to prospectively examine whether analgesic use is a risk factor for hearing loss in women. During follow-up, more than 10,000 women developed hearing loss.

“It appeared that the more often a woman took either of these medications, the higher her risk,” said lead study author Sharon Curhan, MD, MSc, department of medicine, Channing Laboratory of Network Medicine, BWH.

“We found that compared with women who used ibuprofen less than one day per week, the increased risk of developing hearing loss ranged from 13% for those who used ibuprofen 2 to 3 days per week to 24% for women who used it 6 or more days per week,” Dr. Curhan said.

Dr. Curhan and colleagues found that compared with women who used acetaminophen less than one day per week, the increased risk for women who used acetaminophen 2 or more days per week ranged from 11% to 21%, and the risk tended to be higher with increasing use.

According to Dr. Curhan, it is possible that NSAIDs may reduce blood flow to the cochlea and impair its function. Acetaminophen depletes important factors that help protect the cochlea from damage, such as damage that may be caused by noise. There was no association between aspirin use and hearing loss.

Analgesics, such as ibuprofen and acetaminophen, are among the most commonly used medications in the United States. In a government study, more than 80% of women aged 25 years or older reported having used nonprescription analgesic medications within the past month.

“Even though these analgesics are widely available in drugstores and supermarkets without a prescription, these are still medications and there are potential side effects,” Dr. Curhan said. “If individuals need to take these medications regularly, they should consult their healthcare professional in order to discuss the risks and benefits and to explore possible alternatives.”

**Dabigatran results similar to warfarin in diabetes with NVAF**

Patients with nonvalvular atrial fibrillation (NVAF) who also have diabetes experienced similar safety and efficacy with dabigatran etexilate mesylate (Pradaxa) 150 mg or dabigatran 110 mg relative to warfarin, in comparison to patients without diabetes who have NVAF, according to data presented at American Heart Association’s Scientific Sessions 2012.

Data from the RE-LY (Randomized Evaluation of Long-term anticoagulant therapy) subanalysis help increase understanding about a high-risk patient population, said Paul Reilly, PhD, clinical program director, Boehringer Ingelheim.

“It is common for patients with atrial fibrillation to have comorbidities, such as diabetes,” Dr. Reilly said.

RE-LY was a global, phase 3, randomized trial of 18,113 patients enrolled in 951 centers in 44 countries, investigating whether dabigatran etexilate (2 blinded doses) was as effective as open-label warfarin—INR 2.0-3.0—for stroke prevention. Patients with NVAF and at least 1 other risk factor for stroke (ie, previous ischemic stroke, transient ischemic attack, or systemic embolism, left ventricular ejection fraction <40%, symptomatic heart failure, New York Heart Association Class >2, age >75 years, age >65 years with either diabetes mellitus, history of coronary artery disease, or hypertension) were enrolled in the study for 2 years with a minimum follow-up period of 1 year.

The primary end point was incidence of stroke (including ischemic and hemorrhagic) and systemic embolism. The primary safety end point was major bleeding, defined as a reduction in the hemoglobin level of at least 2.0 g/dL, transfusion of at least 2 units of blood, or symptomatic bleeding in a critical area or organ. Other safety end points included bleeding events (major and minor), intracerebral hemorrhage, other intracranial hemorrhage, elevations in liver transaminases, bilirubin and hepatic dysfunction, and other adverse events.

Specifically, of the 18,113 patients in the RE-LY trial, 4,221 patients or 23% had diabetes. “The RE-LY subanalysis shows Pradaxa is effective in this higher-risk NVAF patient population, a group in need of effective treatments,” Dr. Reilly said.
Better control of hypertension seen in U.S. adults, study says

Approximately half of U.S. adults (47.2%) with hypertension had achieved blood pressure (BP) control in 2010 compared to a decade earlier (28.7%) due to greater use of antihypertensive agents, according to research published in the October issue of the American Heart Association journal Circulation.

In 2003, the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) was released, recommending thiazide diuretics as initial drug therapy for most patients with uncomplicated hypertension and combination therapy from agents of different drug classes to reach BP goals, the researchers reported.

The national guidelines recommended a goal of <130/80 mm Hg for hypertensive patients with diabetes mellitus or chronic kidney disease. All other hypertensive patients had a goal of <140/90 mm Hg.

“The JNC 7 guidelines recommend initial combination therapy when BP is >20/10 mm Hg above goal BP. Controlled clinical trials document that ≥2 antihypertensive drugs are required for most hypertensive patients to achieve BP control,” said Qiuping Gu, MD, PhD, MPH, Division of Health and Nutrition Examination Surveys, National Center for Health Statistics, Centers for Disease Control and Prevention, and colleagues.

“However, only 36% of hypertensive individuals were actually taking multiple antihypertensive drugs in 1999 to 2002.”

More than 9,000 Americans were identified as having hypertension in the National Health and Nutrition Examination Survey (NHANES) in the last five data cycles (2001-2002, 2003-2004, 2005-2006, 2007-2008, and 2009-2010). During the 2009 to 2010 NHANES, 77.3% of hypertensive adults reported taking antihypertensive agents to control their BP compared to 63.5% in 2001 to 2002. In addition, 47.7% in the 2009-2010 group were using multiple antihypertensive agents compared to only 36.8% in the 2001-2002 group, the researchers noted.

“All overall, diuretics remained the most commonly used antihypertensive drug class during the 10-year period. By NHANES 2009 to 2010, more than one-third of hypertensive adults reported taking diuretics, an increase of 19% from NHANES 2001 to 2002. Use of thiazide diuretics, one of the major diuretic drug subclasses, accounted for three-fourths of all diuretic use,” Dr. Gu and colleagues reported.

The second most commonly used antihypertensive drug class during the last decade was angiotensin-converting enzyme (ACE) inhibitors. The use of ACE inhibitors increased significantly in monotherapy and polytherapy regimens. Other major drug classes that were used to control hypertension included beta-blockers, calcium-channel blockers, and angiotensin receptor blockers.

In NHANES 2009-2010, lisinopril, an ACE inhibitor, was the most commonly used agent to control BP, followed by metoprolol (a beta-blocker) and hydrochlorothiazide (a thiazide diuretic).

BP control results

Researchers noted in their study that overall BP control rates increased significantly overall and across most subgroups. Overall, BP control rates climbed from 28.7% to 47.2% from 2001-2010, and among drug-treated hypertensive patients, the rates of BP control reached 60.3% from 44.6% a decade earlier.

However, some subgroups had poor hypertension control, the researchers reported. Mexican Americans with hypertension were less likely to adhere to antihypertensive agents and less likely to take multiple agents to control their BP compared with non-Hispanic white individuals. Nonpersistence with prescribed drug therapy was almost 50% higher in Hispanics compared with other racial groups.

Other groups that had difficulty controlling their hypertension despite the use of antihypertensive therapy included older individuals, non-Hispanic black patients, and those with diabetes mellitus or chronic kidney disease, Dr. Gu and colleagues reported.

“In comparison with non-Hispanic white people, non-Hispanic black people had higher odds of using multiple antihypertensive drugs and thiazide diuretics, but lower odds of BP control; Mexican-American people had lower odds of using antihypertensive drugs, multiple antihypertensive drugs, and thiazide diuretics or of achieving BP control,” they reported. “People with diabetes mellitus or chronic kidney disease were more likely to use antihypertensive medications but less likely to have BP control than their respective reference group.”

In addition, individuals with cardiovascular disease (CVD) did not have better BP control than individuals without CVD, despite the use of antihypertensive or multiple antihypertensive drugs.

Hypertensive individuals who were treated with multiple-pill combinations were 26% more likely to meet the BP guidelines from JNC 7 than those receiving monotherapy. Also, those treated with single-pill combination were 55% more likely to reach their BP goals compared with monotherapy recipients.
Pharmacists can help reach goals of “Meaningful Use” incentive program

On Dec. 30, 2009, CMS launched its “meaningful use” (MU) incentive program for use of electronic health records (EHR). Designed to help spur providers and hospitals to meet the 2014 mandate for implementing EHR systems, the incentive program progresses as two stages: Stage 1, which began in 2011, and Stage 2, now extended to 2014.

Eligible professionals (EP) who adopt EHR, and successfully meet core objectives in reporting their MU quality measures, can receive up to $44,000 under the Medicare EHR Incentive Program, or up to $63,750 under the Medicaid program. Eligible hospitals and critical access hospitals will be able to receive incentive payments from both the Medicare and Medicaid EHR Incentive Programs. The program is part of the Health and Human Services (HHS) national Health Information Technology (HIT) initiative with oversight by the HIT Office of the National Coordinator (ONC).

To ensure that pharmacists were also incorporated into this national HIT structure, a consensus advocacy group, the Pharmacy Health Information Technology Collaborative, was formed a year later. Representing the voice of nine pharmacy organizations, the Collaborative authored The Roadmap for Pharmacy Health Information Technology in U.S. Health Care with recommendations for pharmacy HIT for 2011 to 2015.

The Roadmap describes MU as “promoting recognition of pharmacists as meaningful users of EHR and as having an impact on MU quality measures of other eligible professionals and hospitals that receive CMS incentives for the MU of EHRs.”

Collaborative Executive Director Shelly Spiro says promoting the Roadmap MU goals to stakeholders is a priority.

“We want to ensure pharmacists are part of the interprofessional team and that they are working in an interdisciplinary manner and taking care of patients in a longitudinal way, not just dispensing,” she says.

Pharmacy practice comments on final rule
On Sept. 4, HHS released the final rule of Stage 2 of the Electronic Health Record Incentive Program for EHR Technology. The 200-page document reflects input of 6,100 industry and provider comments to the ONC, and outlines final definitions, revisions, and timelines needed for qualifying eligible providers and hospitals to receive MU incentive payments.

Karl Gumpper, RPh, BCPS, FASHP, director, Section of Pharmacy Informatics and Technology, American Society of Health-System Pharmacists (ASHP), says the organization’s comments to the ONC included expanding clinical-decision support to include administration and monitoring, particularly when patients have a transition in care.

“If you touch anyone with a prescription, then you should have a pharmacist engaged in the process to have oversight on drug interactions and medication management, particularly during transition of care from hospitals to nursing homes, ambulatory care, or other referral sites,” he said.

Spiro concurs: “The majority of the medication misadventures that cause hospital readmissions occur during transition of care,” but she adds that pharmacists can monitor and manage the medication during transition using HIT and e-prescribing—another means to support providers in meeting MU objectives.

In the September final rule, CMS “refined their definition of transitions” and also made amendments to clinical-decision support.

Ronna Hauser, RPh, vice president of policy and regulatory affairs, National Community Pharmacy Association (NCPA), says the organization “supports full implementation of electronic health records.” However, since pharmacists are not eligible for the financial incentives, “policymakers should proceed in a manner that is as cost-neutral as possible for pharmacies. The last thing community pharmacists need is another unfunded mandate that makes it more difficult to maintain community pharmacies and serve patients,” Hauser says.

In their letter of public comment submitted May 7 by the National Association of Chain Drug Stores (NACDS), Kevin N. Nicholson, RPh, JD, vice president of government affairs and public policy, says NACDS “applauded the ONC for recognizing e-prescribing in their definition of ‘meaningful use.’” Nicholson said the NACDS recommended formulary checks be included as part of the e-prescribing workflow.

The HHS final rule states that “drug formulary checks are most useful when performed in combination with e-prescribing,” and that this will allow the EP or hospital “to increase the efficiency of care and benefit the patient financially.”

Spiro emphasizes that pharmacists have an “opportunity to see the patient more often, and patients have much easier access to pharmacists,” and that “this huge amount of pharmacist participation can help the providers and hospitals immensely in meeting their meaningful use objectives.”

Barbara Hesselgrave is a freelance writer based in Cleveland, Ohio.

Barbara Hesselgrave
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Get back to good digestive health following the holidays

MIRANDA HESTER, CONTENT COORDINATOR

The holiday season has arrived, so kids and adults may reach for an extra glass of eggnog, one more cookie, or another piece of pumpkin pie. With such a wide variety of fattening foods and drinks and the possibility of overindulgence, it is time again to examine your pharmacy shelves for needed relief. Here are a few suggestions to help your patients experience some form of digestive comfort.

**Gluten digestive**

Enzymedica recently added GlutenEase 2X to its line-up of digestive enzymes. The product features a new high-potency Protease Thera-blend that increases the efficiency of gluten protein digestion. GlutenEase 2X digests twice the amount of gluten that Enzymedica's GlutenEase does and has a 100% money-back guarantee.

Nature Made's Digestive Health Probiotic helps provide a balanced amount of beneficial bacteria in the digestive tract. Every capsule contains 10 billion live cells of the Probi Digestis probiotic strain, which adheres to the intestinal wall to promote the generation of Lactobacillus plantarum 299v.

**Dairy-free digestive relief**

Culturelle has two products to keep children's digestive systems in working order. Kids Packets use dairy-free Lactobacillus GG to reduce the occurrence of occasional digestive distress while supporting the defense system already in place. The packet can easily be dissolved in cool food or drink and has no flavor. Culturelle's Kids Chewables provide the same benefits as their Kids Packets for older children and comes in a pleasing Natural Bursting Berry flavor.

For adults, Culturelle offers Digestive Health, which contains 10 billion cells of dairy-free Lactobacillus GG to help soothe gas, bloating, and digestive upset. Digestive Health can be used to cut down on digestive upset while traveling. The product can be given to children 1 year or older, but medical consultation is recommended.

Culturelle's Health and Wellness capsules can promote and maintain a healthy digestive system and help support a healthy immune system. Like all of Culturelle's products, it contains Lactobacillus GG, which is not dairy-free in this product. A vegetarian version of the product is also available with dairy-free Lactobacillus and natural vegetarian capsules.

Wellesse's Digestive 3-in-1 Health liquid promotes digestive health three different ways. A soluble fiber blend keeps nutrients moving through the system, while providing a sense of fullness that can also aid weight management. Prebiotics help keep balance in the intestinal tract. Aloe Vera extract helps balance stomach acidity and ease digestive discomforts. The liquid has 5 g of fiber and features an orange-vanilla flavor.
RX & OTC

New products

RX CARE

New drugs

FDA has approved Pfizer’s Xeljanz (tofacitinib citrate) to treat adults with moderately to severely active rheumatoid arthritis (RA) who have had an inadequate response to, or who are intolerant of, methotrexate. Xeljanz is a tablet taken twice daily and works by blocking Janus kinases, which are important in the joint inflammation of RA. The use of Xeljanz can be associated with an increased risk of serious infections, including opportunistic infections, tuberculosis, cancers, and lymphomas. Xeljanz carries a Boxed Warning regarding these safety risks. Treatment with Xeljanz is also associated with increases in cholesterol and liver enzyme tests and decreases in blood counts. (www.xeljanz.com)

Synribo (omacetaxine mepesuccinate) to treat adults with chronic myelogenous leukemia (CML), a blood and bone marrow disease. Synribo is intended to be used in patients whose cancer progressed after treatment with at least two drugs from a class called tyrosine kinase inhibitors (TKIs), also used to treat CML. The most common side effects reported during clinical studies include a low level of platelets in the blood (thrombocytopenia), low red blood cell count (anemia), a decrease in infection-fighting white blood cells (neutropenia) that may lead to infection and fever (leukopenia), diarrhea, nausea, weakness and fatigue, injection-site reaction, and a decrease in the number of lymphocytes in the blood (lymphopenia). (synribo.com)

Fycompa (perampanel), AMPA receptor antagonist, from Eisai has been FDA approved. Fycompa is indicated as an adjunctive treatment of partial-onset seizures with or without secondarily generalized seizures in patients aged 12 years and older who have epilepsy. Fycompa reduces neuronal hyperexcitation associated with seizures by inhibiting glutamate activity at post-synaptic AMPA receptors. This is the first antiepileptic agent approved by FDA to work in this manner. The most commonly reported adverse events were dizziness, somnolence, fatigue, irritability, falls, nausea, ataxia, balance disorder, gait disturbance, vertigo, and weight gain. Fycompa’s label has a Boxed Warning to alert prescribers and patients about the risk of serious neuropsychiatric events, including irritability, aggression, anger, anxiety, paranoia, euphoric mood, agitation, and mental status changes. Some of these events were reported as serious and life-threatening. Violent thoughts or threatening behavior was also observed in a few patients. Patients and caregivers should alert a healthcare professional immediately if changes in mood or behavior that are not typical for the patient are observed. Healthcare professionals should closely monitor patients during the titration period when higher doses are used. FDA recommended that Fycompa be classified by the U.S. Drug Enforcement Administration (DEA) as a scheduled drug under the Controlled Substances Act. Once the DEA has provided the final scheduling designation, Eisai will announce when Fycompa will be available to patients and physicians in the United States. (http://us.eisai.com/package Inserts/ FycompaPI.pdf)

Mission Pharmacal’s Binosto (alendronate sodium) effervescent tablet for buffered oral solution (70 mg) is now available by prescription. FDA approved Binosto to treat osteoporosis in postmenopausal women and to increase bone mass in men with osteoporosis. Binosto represents a true innovation in the delivery of osteoporosis and bone fracture prevention medication, especially for patients who prefer not to swallow tablets, suffer with dysphagia, or have other medical difficulties swallowing pills. Binosto is a once weekly, strawberry-flavored effervescent tablet that contains alendronate and dissolves in half a glass of plain room temperature water to make a buffered solution. It is available in packs of four. (www.missionpharmacal.com)

Teva has announced approval of Forfivo XL (bupropion hydrochloride 450-mg extended-release) tablets are now available. Forfivo XL is indicated for treatment of major depressive disorder (MDD) and is the only extended-release bupropion HCI product to provide a once-daily, 450-mg dose in a single tablet. The active ingredient in Forfivo XL is bupropion, the same active ingredient used in Wellbutrin XL. Until now, most patients in the requiring a 450-mg dose of bupropion have been taking multiple tablets to achieve their 450-mg dose requirement. Antidepressants increased the risk compared to placebo of suicidal thinking and behavior (suicidality) in children, adolescents, and young adults in short-
term studies of MDD and other psychiatric disorders. Patients of all ages who are started on antidepressant therapy should be monitored appropriately and observed closely for clinical worsening, suicidality, or unusual changes in behavior. Families and caregivers should be advised of the need for close observation and communication with the prescriber. Forfivo XL is not approved for use in pediatric patients. (http://www.forfivoxl.com/?gclid=CPK02fis0bMCFcp9Ogod9nAAhg)

Thrombogenics’ Jetrea (ocriplasmin) is the first drug approved to treat an eye condition called symptomatic vitreomacular adhesion (VMA). VMA can contribute to eye problems if the vitreous (jelly in the center of the eye) starts to move away from the macula (a part of the retina responsible for reading vision). This movement can lead to damage of the macula due to pulling or tugging on the macula. The most common side effects reported in patients treated with Jetrea include eye floaters; bleeding of the conjunctiva, the tissue that lines the inside of the eyelids and covers the white part of the eye; eye pain; flashes of light; blurred vision; unclear vision; vision loss; retinal edema; and macular edema. (www.jetrea.com)

FDA has approved Novartis Vaccines’ Flucelvax (Influenza Virus Vaccine), the first cell-culture-derived vaccine, for the prevention of seasonal influenza in individuals aged 18 years of age and older. Full-scale cell-culture manufacturing technology was used to create the vaccine, an alternative production method to traditional egg-based production. Cell-culture technology uses a well-characterized mammalian cell line rather than chicken eggs to grow virus strains. The production occurs in a closed, sterile, controlled environment, which significantly reduces the risk of potential impurities. Flucelvax does not contain any preservatives, such as thimerosal, or antibiotics. Novartis has partnered with the U.S. Department of Health and Human Services, Biomedical Advanced Research and Development Authority (HHS, BARDA) for the development of the cell-culture manufacturing technology, as well as for construction of the state-of-the-art facility in Holly Springs, N.C. Total public/private investment in the technology development and facility is more than $1 billion. (http://www.novartis.com)

**New indication**

The approved use of oral anticoagulant Xarelto (rivaroxaban) from Janssen has been expanded to include three new indications: treatment of deep vein thrombosis (DVT), treatment of pulmonary embolism (PE), and reducing the risk of recurrent DVT and PE following initial treatment. Xarelto is already FDA-approved to reduce the risk of DVTs and PEs from occurring after knee or hip replacement surgery (July 2011), and to reduce the risk of stroke in people with non-valvular atrial fibrillation (November 2011).

Xarelto is broadly reimbursed for more than 90% of commercial and Medicare health plan members, with the majority covered at the lowest branded copay. (www.xarelto-us.com)

**New generics**

Watson has received approval for its sildenafil tablets, 20 mg, the generic equivalent to Pfizer’s Revatio. Revatio is indicated for the treatment of pulmonary arterial hypertension in adults to improve exercise ability and delay clinical worsening. Watson intends to begin shipping the product in the near future.

Sandoz launches its desoximetasone ointment USP, 0.25%, a generic equivalent of Taro’s Topicort 0.25% Ointment. Desoximetasone ointment is a topical corticosteroid used to relieve redness, swelling, and itching that result from various inflammatory skin diseases.

**OTC**

Dermedics Laboratories introduces X-PEL Anti-Lice Shampoo & Conditioner, a non-toxic alternative to older head lice treatments. X-PEL is said to eliminate lice in about 10 minutes and makes it easier to remove the lice eggs, relieves the itching caused by lice bites, and helps to prevent reinfestation when used as directed. Unlike other head lice treatments, X-PEL uses no toxic chemicals. It is dermatologist and pediatrician approved. A single 6- fl. oz bottle is enough for 6 to 12 shampoos. (http://x-pelheadlice.com)

**Triple Neem Ointment** from Organix-South is an organic alternative to Neosporin. Triple Neem Ointment is made from certified organic sesame oil, beeswax, rose geranium, ylang ylang, arjuna, calendula, and supercritical extracts of neem leaf, bark, and oil. When applied topically, Triple Neem Ointment is cooling and soothing, and is beneficial for a variety of skin irritations including cuts, scrapes, burns, diaper rash, bug bites, acne, and eczema. (www.organix-south.com)

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DRUG TOPICS

55
A tragic lesson in risk management

A gain we watch a tragedy unfold linking a compounding error to injury and death. Pharmacy is about healing and saving lives. But today and for several days the nation’s headlines portray our profession as careless and out of control.

Thousand of prescriptions are compounded correctly and accurately every day and they save lives. We must recognize, however, that we all make mistakes and there are those who would cut corners and endanger patients through risky behavior. Boards of pharmacy and FDA set and enforce rules for pharmacies and manufacturers in order to provide minimums that everyone must meet. Some states need to strengthen these minimums. The pharmacy profession should work with the boards to pass effective and workable rules for not just sterile, but all compounding. However, compounding pharmacies should not wait for someone else to set standards.¹

Do more than the minimum

Sometimes we use laws and regulations as an excuse for doing only what is the minimum necessary. Pharmacists should not be content to do the least required by law. Each pharmacy should adopt its own strict standards. That does not mean boards of pharmacy should not strengthen state rules on compounding; they should. After the 2002 tragedy at Doc’s Pharmacy, California’s Board of Pharmacy toughened its rules for sterile compounding, reducing the risk of similar errors in the future.

Government rules must be recognized for what they are – a minimum – the least that must be done. Patient safety and risk management require more than that. Instead of minimum standards, compounders should test themselves against higher professional standards. Instead of a board inspector visiting the pharmacy and testing procedures once every quarter or year, pharmacists are in a position to examine what is happening in their pharmacy every day and should be testing their quality with each compounded product.

Risk management teaches that we must learn from errors to assure, to the extent possible, there will not be a repeat of the nightmare. A root cause analysis identifies one or more mistakes that, if prevented, would ensure the error will not happen again.

NECC errors to provide lessons

The New England Compounding Center will provide lessons, but it is probably too soon to know definitively what were the root causes of those errors. Reports have indicated the products may have been incompetently sterilized; samples tested may have been too small; beyond use date incorrect or not properly used; or the clean room may not have met USP <797> standards. As facts emerge, we will learn more.

Compounding pharmacies need not wait for more regulations or complete analysis of this incident. Compounding pharmacists should analyze what their pharmacies do.

• Do they exceed minimum standards set by the board of pharmacy?
• Do they have a benchmark against which to test their products, policies, and procedures?

• Are their pharmacies accredited by the Pharmacy Compounding Accreditation Board or a comparable standards body?
• How often do they test results?
• Are the sample sizes large enough to guarantee accuracy?
• Is the pharmacy’s continuous quality improvement (CQI) workflow and program as good as it could be?

The greatest fear for pharmacists is that something they do or fail to do will injure a patient. We need not wait for government to act; we need just to remember that fear and act accordingly. CQI means we improve every day and we learn from each error.²

Reference

1. In May I wrote an article for Drug Topics encouraging compounding pharmacies to seek accreditation. In that article I should have made it clearer that Boards of pharmacy have an important role in insuring quality. The point was, however, pharmacists should seek higher standards than those set by law. This article tries to clarify that point. See Drug Topics, May 15, 2012, Baker, K.R., “Accreditation standards buttress compounding pharmacy.”

These articles are not intended as legal advice and should not be used as such. When a legal question arises, the pharmacist should consult with an attorney familiar with pharmacy law in his or her state.

Ken Baker is a pharmacist and an attorney consulting in the areas of pharmacy error reduction, communication, and risk management. Mr. Baker is an attorney of counsel with the Arizona law firm of Renaud Cook Drury Mesaro, Pa. Contact him by e-mail at ken@kenbakerconsulting.com.
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How is Mylan partnering to improve quality standards around the world?

See inside.

With approximately 40% of drugs consumed by U.S. patients being manufactured abroad, the need for universal quality standards has never been more critical. Mylan recently helped champion the FDA Safety and Innovation Act, which holds both foreign and domestic manufacturers to one global quality standard. This is just one way Mylan is working to set new standards in health care through passionate global leadership.


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