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January 26, 2013
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Contact Garrett Husted for more info!

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It’s the Small Things

Being a mentor can be a profound way to make a difference. There are many types of mentors – teachers, bosses, scout leaders, coaches, big brothers/sisters – you get the idea. Young and old, formal and informal, mentoring is an invaluable gift for both the mentor and the mentee. It doesn’t cost any money yet the gift is priceless.

If you are a preceptor, you know how rewarding this experience can be. Engaging with the future leaders of our profession, having the opportunity to introduce them to aspects of our profession that may spark their passion for a particular career path, is an incredible treasure.

Being involved with the Arizona Pharmacy Association is another “small thing” you can do to make a difference. Passionate about politics? Become a part of the Legislative Affairs Committee. Want to be a mentor? Check out the AzPA Mentor Connection Program. Concerned about prescription drug abuse? Connect with the Arizona Pharmacy Foundation and AWARxE. Love to teach? Volunteer to write a continuing education article for the Journal or be a speaker at one of the AzPA conferences. Too busy for any of these activities? That’s okay. You are saying “yes” to all of these efforts with your AzPA membership dues.

Saying “yes” to something small can have a huge impact on a patient, a relative, a student, a neighbor, a friend, even a stranger. Lending an ear, opening a door, offering advice, making a donation – these all make a difference to someone. Throughout this issue of the Arizona Journal of Pharmacy you will find many articles from people who are passionate about giving back. I hope it inspires you to take the time to find the small things that you can appreciate and share with others.

“From what we get, we can make a living; what we give, however, makes a life.”

~ Arthur Ashe
In the 2012 Gallup Poll entitled “perceived honesty and ethical standards of professions,” pharmacists ranked second with a record 75% of the respondents giving the profession a very high/high rating. Only nurses scored higher at 85%.

As trusted professionals, pharmacists are uniquely positioned to Advocate, Communicate, and Educate (A.C.E) the patients we serve not just in the workplace but throughout our communities. The public needs and wants to hear from their local pharmacists.

A 2000 estimate of pharmacy patronage showed that the equivalent of the entire U.S. population (approximately 275 million people at the time of publication) visited pharmacies each week. Pharmacists are underutilized in addressing the health care needs of the nation. Pharmacists are medication experts and since medications are involved in 80 percent of all treatments and drug-related morbidity and mortality cost this country $200 billion dollars annually, we need to step up and help our communities solve this problem.

To make matters worse, America’s biggest drug problem isn’t on the streets; it’s in our medicine cabinets. The majority of teens report that prescription drugs are easier to get than illegal drugs and many believe that abusing prescription drugs is much safer than illegal “street” drugs. According to the CDC, unintentional drug poisoning is now the second leading cause of accidental death in the United States. Pharmacists understand the dangers of prescription drug abuse and misuse and as respected community leaders can help address this problem. The Arizona Pharmacy Association (AzPA) offers you the resources to become a Pharmacy A.C.E.

ADVOCATE

Your voice is important in matters of pharmacy. Lawmakers can only represent you and your interests if you let them know what is important to you. Becoming an advocate is as simple as writing a letter to your elected officials or making a donation to a political action committee.

The AzPA Legislative Affairs Committee focuses primarily on state and local issues related to the pharmacy profession. Past legislative successes have included the expansion of immunization authority for pharmacists and student pharmacists and the enhanced definition of collaborative practice agreements. The Committee is open to all AzPA members. Monthly meetings are by teleconference on the first Wednesday of the month at 12:00 noon.

Pharmacists Political Action Committee of Arizona (PharmPAC) is a voluntary political action committee that allows AzPA members to pool their resources to support state candidates who understand and appreciate the value of our profession and its importance in improving health care.

COMMUNICATE

Communicate what pharmacists can do and are doing every day to impact patient care. Do your part to ensure that others know how valuable we are on the health care team. Too many people do not know about how pharmacists are playing an active role in preventative health and wellness as well as advanced medication management to treat chronic diseases.

Become a role model for safe medication practices. Educate all your patients to secure and properly store their prescription drugs and, more importantly, dispose of them properly. Don’t assume that others around you are informed about the problem of prescription drug abuse and misuse. Talk about it with your family members, friends, neighbors, patients, and elected officials.

EDUCATE

Pharmacists in Arizona have started to deliver patient care services in a variety of practice settings through immunization services, preventative screening services, and drug therapy management protocols to manage disease. They perform patient assessments; initiate, adjust, or discontinue treatment to manage disease; order and interpret laboratory tests; formulate clinical assessments and develop therapeutic plans; and provide care coordination and other health services for wellness and prevention of disease. We need more pharmacists ready and willing to talk to their local providers and get more of these agreements in place. We are uniquely positioned to dramatically improve medication use in our patients but we need to take the first step and engage our provider community.

Beyond counseling patients on proper medication use, pharmacists are a valuable resource to the community for protecting family and friends from prescription drug abuse and misuse. Programs like Katy’s Kids, AWARx, and GenerationRx offer tools to educate the public on safe acquisition of prescription drugs, appropriate use of medications, proper methods of disposal of unneeded medications, and warning signs of potential abuse and misuse. Visit the AzPA website at www.azpharmacy.org for details and to access all you’re A.C.E. resources.

The Arizona Pharmacy Foundation and Pharmacists Assisting Pharmacists of Arizona (PAPA) are presenting the Inaugural Southwest Pharmacy Symposium on January 26, 2013. (Details on page 8.) This is a great place to start on the path to becoming a Pharmacy A.C.E.

References:
How does your Professional Liability measure up?

Coverage Benefits

Our Professional Liability Policy is specifically designed as excess coverage, yet it can become your first line of defense when no other coverage is available.

- **Additional protection** for you above that provided by your employer.
- **Covered 24 hours a day** anywhere in the United States, its territories and possessions, Canada or Puerto Rico.
- **Covers compounding and immunizations** (if legal in your state).
- **On-staff pharmacist-attorneys are available to counsel** policyholders.
- **Risk management assistance** that may reduce pharmacy professional exposure.

**Apply Online!**
Go to [www.phmic.com](http://www.phmic.com), and choose the Pharmacist Liability Application under the Online Services tab.

For more information, please contact your local representative:

**Ryan Goodrich**
800.247.5930 ext. 7133
480.332.5656
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Sue Young Lee
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Katie Limke
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Endorsed by:
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800.247.5930 ext. 7133
480.332.5656
Arizona Pharmacy Association

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AzPA Launches Arizona Center for Professional Education - AzCPE

Need continuing pharmacy education but can’t get to an AzPA conference? AzPA now offers online CE with special pricing for members.

The AzCPE currently offers more than 70 on demand home-study activities encompassing disease states, compounding, compliance standards, legal issues, and other health-related topics. Recent additions to the library include psychiatric disorders, Stark Law update, and DEA due diligence.

AzCPE also stores your continuing education credits for NABP CPE Monitor reporting. No more paper certificates to save for license renewal!

Affordable and convenient, the AzCPE online platform is located under the Continuing Education tab of the AzPA website at www.azpharmacy.org.

New Arizona Pharmacy Law and Public Policy Course Launches in 2013

AzPA has recently revised the Arizona Pharmacy Law and Public Policy Course. The online course will be available on the AzCPE website in late January 2013. Designed as a comprehensive overview of Arizona’s pharmacy law, the course may be used for reciprocity into Arizona, by recent pharmacy school graduates preparing to take the MPJE, or by anyone wanting an update on pharmacy law.

The course was developed by the Arizona Pharmacy Association in cooperation with Mary Gurney, R.Ph., Ph.D., Roger Morris, R.Ph., J.D., and Theo Graphos, Pharm.D. Watch for more information coming soon.

PTCB Exam Prep Course Moves Online

The AzPA Pharmacy Technician Certification Board (PTCB) Exam Prep Course is going high-tech. The popular seven-week course developed and taught by AzPA member Carl Labbe, R.Ph. will soon be available on demand on the AzCPE website. The course helps prepare pharmacy technicians* to successfully complete PTCB’s technician certification exam. Participants discover and develop techniques that will enhance their performance as pharmacy technicians. The course agenda covers introductory principles, medical terminology, drug lists, measures, math, pharmacy law, professionalism and ethics, and more.

For more information about the AzPA PTCB Exam Prep Course, please call the AzPA office at 480 838-3385.

*The course does not provide training to become a pharmacy technician but is intended for those preparing to take the PTCB technician certification exam. Prior work experience is strongly recommended but not required.

Shop Amazon.com and Support AzPA

Buying textbooks for next semester? Doing some after Christmas shopping? If you will be shopping online at Amazon.com, the Arizona Pharmacy Association can benefit from your purchases.

Visit the home page of the AzPA website to enter the Amazon site through the AzPA Amazon Affiliates URL. Then bookmark the page so that every time you shop at Amazon.com a portion of your total purchases will be donated to AzPA by Amazon. It’s that simple. Go to www.azpharmacy.org and click on the Amazon logo to get started.
CHEERS FOR VOLUNTEERS!

The Arizona Pharmacy Association staff is here to support YOU - our members. We acknowledge the contributions of the volunteers who have made a difference for our organization and their fellow pharmacy professionals. Thank you for all you do!

Kasidy McKay
Kyle DeWitt
Kristen Senson
Linda Trinh
Taylor Jackson
Ronni Nemeth
Joyce Buchanan
Kali Jo Finn
Gina Buicocchi
Alex Dong
Stacy Haber
Irene Coon
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Bill Jones
Linda McCoy
Crane Davis
Kevin Boesen
Dawn Knudsen Gerber
Hal Wand
Rick Steiner
Ray Clark
Mark Rhoads
Blake Stine
Golden Berrett
Jessica Stiles
Jordan Davis

Do you know someone who is not a member of the Arizona Pharmacy Association . . . and should be?!

Invite them to join the only statewide organization that represents the pharmacy profession in Arizona.

Annual dues for a pharmacist are just $20 per month! This equates to:

- Approximately 2/10 of 1% of the annual wage for a new practitioner pharmacist
- Less than 5 hours of work per year, after taxes
- Less than 62 cents per day

Visit the AzPA website at www.azpharmacy.org to join online or to download a printable Membership Investment Statement.

AzPA values its members and recognizes that your time is valuable. Monthly payment plans are available for pharmacist membership categories, as well as an automatic annual renewal option, when you provide your credit card information.
SAVE THE DATES! Two great programs!

Friday, January 25, 2013
AzPA Psychiatric Certificate Program

Assessing, Monitoring, and Managing Patients with Psychiatric Disorders: Comprehensive Medication Therapy Management to Optimize Pharmaceutical Care

Program Description:
Developed by the Arizona Pharmacy Association, the Psychiatric Certificate Program (PCP) is a practice-based activity designed for pharmacists in all practice settings. The intent of this training program is to provide additional training in the area of psychiatric pharmacy to enhance pharmacists’ clinical knowledge that can be applied directly to the patients they serve.

Program Facilitators:
Martha Fankhauser, MS Pharm, FASHP, BCPP, U of A College of Pharmacy
Lisa Goldstone, MS, LPC, Pharm.D., BCPS, U of A College of Pharmacy
Elizabeth Pogge, Pharm.D., BCPS, Midwestern University College of Pharmacy

Program Goals:
• Provide training to enhance a practitioner’s ability to effectively assess, monitor, and manage the pharmacotherapy of patients with psychiatric disorders.
• Deliver comprehensive medication therapy management to prevent, treat, and control psychiatric disorders using patient-centered care.
• Promote appropriate and optimal medication use and adherence that minimizes drug interactions, polypharmacy, and adverse effects.
• Encourage healthy lifestyles and non-drug treatment approaches for optimizing a person’s mental and physical health.

To register online go to www.azpharmacy.org/PsychCertProgram

Saturday, January 26, 2013
Inaugural Southwest Pharmacy Symposium

Become a Pharmacy A.C.E.
Advocate
Communicate
Educate

SPONSORED BY:
Cardinal Health

Presented by the Arizona Pharmacy Foundation and Pharmacists Assisting Pharmacists of Arizona

The Inaugural Southwest Pharmacy Symposium is presented by the Arizona Pharmacy Foundation and Pharmacists Assisting Pharmacists of Arizona (PAPA). The day-long event will feature:
• Continuing pharmacy education programs to prepare pharmacy professionals to advocate for patients; communicate and educate the public on the proper use of medications; and develop and participate in community outreach programs. A total of 6.5 hours (0.65 CEUs) are planned for this event.
• Presentation of the first Cardinal Health GenerationRx Champions Award honoring an Arizona pharmacist who has demonstrated outstanding commitment to raising awareness of the dangers of prescription drug abuse among the general public and the pharmacy community.
• Announcement of the 2013 Llyn Lloyd Service to Pharmacy Scholarship winners.

To register online go to www.azpharmacy.org/SWRxSymposium

Visit the AzPA Website at www.azpharmacy.org to view full agenda and to register.
WHAT IS PAPA?

PAPA Mission Statement:
The purpose of the Pharmacists Assisting Pharmacists of Arizona (PAPA) program is to provide assistance to any pharmacist, pharmacy student, or pharmacy technician with an impairment. Though emphasis is on alcohol and/or drug dependency, the program offers support or referrals to other needed programs. The PAPA program is designed to serve both a Board-mandated participant (non-confidential) and a self-referred participant (confidential).

PAPA History
Due to the concern and perseverance of pharmacists Mike Henry, Stan Sirotta, Dan Boesen, and Llyn Lloyd, PAPA was established in July 1989. The program was set up under the direction of the Arizona Pharmacy Foundation (APF) and administered from the Arizona Pharmacy Association (APA) office.

Prior to the PAPA program, Mike Henry and Stan Sirotta played an important role in intervening with pharmacists in trouble. Their role was to assist an impaired pharmacist in getting into a rehab program and advocate for them when they appeared before the Arizona State Board of Pharmacy. During this time period, the Executive Director of the Arizona Pharmacy Association, Dan Boesen, took an active role to help structure the administrative function of the PAPA program. It was with his help that the program became formalized under the Arizona Pharmacy Foundation (APF).

Dan, Stan, and Mike worked with the Arizona State Board of Pharmacy and helped educate the Executive Director, Llyn Lloyd of the importance of the program. Llyn stated, “My first exposure to recovery activities was as a representative of the NABP at the Utah School. I was the victim of an involuntary metamorphosis! I saw the light and joined the ‘recovery movement’. Through gentle persuasion and repetition I was able to convince board members that ‘recovery’ rather than punishment was the better approach in addressing illicit drug/alcohol use”. With Llyn’s compassion and desire to learn more, the relationship between PAPA and the Arizona State Board of Pharmacy was formed. Also, with Llyn’s help the Arizona State Board of Pharmacy was able to pass a statute that allowed the Board to contract with a program such as PAPA and provide financial assistance from the state.

In 1994, the program started a volunteer Steering Committee that comprised of five individuals with representation of an Arizona Pharmacy Association staff member, a State Board of Pharmacy staff member, and at least one past PAPA program participant.

The program began with one counselor in Phoenix and expanded in 1995 to one more in Tucson. Both counselors held one group each week. Today, PAPA has two counselors in the Phoenix area that counsel four groups per week. Counselors in both the Tucson and Flagstaff area also counsel one group per week.

Today the Steering Committee is comprised of seven volunteer members, one Arizona State Board of Pharmacy staff member, and one administrative coordinator.

PAPA Steering Committee
Vince Angichiodo
Brad Barron
Denis Johannes
Steve LeMaheiu
Mark Murphy
Chris Perry
Joe Rowan
Cheryl Frush, Arizona State Board of Pharmacy
Lisa Yates, PAPA Administrator

If you or someone you care about is suffering from an alcohol and/or chemical dependency problem...
...help is available.

Pharmacists Assisting Pharmacists of Arizona
“A Partnership in Caring”

Contact Lisa Yates, PAPA Program Administrator at 928.532.2293 or papa@azpharmacy.org

All calls confidential. Caller remains anonymous.

PAPA is a program of the Arizona Pharmacy Foundation
LEGISLATIVE UPDATE

1. AzaPA’s Sunrise Application to Clarify and Modify a Pharmacist’s Scope of Practice Proceeds to Next Step

On December 19, 2012, the Arizona Pharmacy Association’s Sunrise Application to clarify the role of the pharmacist acting within a collaborative practice agreement was heard at the legislature’s Joint Legislative Audit Committee (JLAC). The Sunrise Application is a legislative process unique to Arizona. It is necessary for any health care discipline that proposes changes to their own scope of practice. AzaPA is not asking for a change to the current scope of practice for pharmacists, but is requesting technical changes to the statute describing when a pharmacist is permitted to implement and modify drug therapy under Ariz. Rev. Stat. § 32-170.

In 2011, Arizona’s collaborative practice laws were expanded to allow any pharmacist and provider (physician or nurse practitioner) to enter into a “protocol-based drug therapy agreement,” which would allow a pharmacist to initiate and modify drug therapy orders for patients subject to boundaries of the protocol.

Today, pharmacists working under protocol are frequently faced with a protocol that includes instructions for initiating or modifying a medication classified as a controlled substance. To write an order for a controlled substance, the pharmacist is required to apply for a DEA registration number. The DEA has not yet approved pharmacists’ applications for a registrant number. Although the DEA is still reviewing current statutory language that already provides pharmacists with the ability to implement and modify drug therapy under protocol, AzaPA has asked the legislature for technical changes to the law to make it clear to the DEA that pharmacists have an urgent need to register for a DEA number.

The JLAC assigned the Sunrise Application to a Committee of Reference. During the next legislative session, it is expected that the health committees in both chambers will hear the Sunrise Application unless the DEA takes action in the interim to approve pending pharmacists’ applications.

2. American College of Clinical Pharmacy (ACCP) Releases a Position Statement Pertaining to Medicare Provider Status for Pharmacists

Earlier this year, ACCP released its formal position on the role of pharmacists as providers within the Social Security Act (SSA). The entire position statement can be found on their website http://www.accp.com/announcements/providerstatus.aspx. Although this initiative is not new as the national pharmacy organizations have been working on a strategy to obtain meaningful recognition of the professional within the SSA for decades, this is the latest initiative proposed by a national organization in Washington, DC. The state of Arizona presented this concept to the APhA House of Delegates in March of 2012. The matter was “referred” to another body within APhA, but AzaPA has not received follow up from APhA.

At this time, AzaPA members are encouraged to review the statement and initiative published by ACCP and forward comments to the Legislative Committee Chair for AzaPA, Dr. Mark Boesen (legislative@azpharmacy.org).

3. Arizona State Board of Pharmacy (ASBP) Omnibus Bill Expected

ASBP will introduce a bill next legislative session to make technical changes necessary to efficiently implement pharmacy practice act provisions. Among the changes expected is a decision to make it easy for practicing pharmacists in other states to move to Arizona and practice. Under the current law, a pharmacist may reciprocate his or her license only if the pharmacist’s original license acquired through passage of the NAPLEX (or score transfer) is active. Pharmacists whose only active license is one that was conferred through reciprocity are not eligible for reciprocating in Arizona.

4. Arizona Veterinary Medical Association is Expected to Introduce a Bill that Would Clarify their Practice Act

AzaPA is working with the Arizona Veterinary Medical Association (AzVMA) to increase awareness regarding the scope of practice of a veterinarian as it relates to their ability to compound medications for animals under their care. Current law allows veterinarians to dispense and administer medications to animals under their care, but does not include the word “compound.” Veterinarians would like to make veterinary compounding an expressly permissible activity within their practice. The bill is expected to restrict compounding to the practice of the licensed veterinarian only, and only for the purpose of caring for animals under his or her direct care.

The bill would not permit a veterinarian to dispense compounded medications to animals not under the care of the veterinarian. The bill would also require veterinarians to mirror the definition of dispensing in the pharmacy practice act with the expectation that veterinarians that choose to compound for their patients would follow Good Compounding Practices.

AzaPA and the AzVMA are concerned about the training of veterinarians and pharmacists alike when compounding medications for animals. A joint effort to develop veterinary pharmacy educational programs targeted to an interdisciplinary audience (veterinarians and pharmacists) is in beginning discussions. This bill is not, in anyway, expected to result in a change in prescribing habits of veterinarians. AzaPA’s veterinary pharmacy providers are not expected to be impacted by this bill as the veterinarians are only proposing to codify language in their statute that recognizes current standards of care within their discipline.

5. Arizona Psychologists and Chiropractors Expected to Introduce Bills to Expand Prescribing Authority

It is expected that both the chiropractors and psychologists will introduce legislation this spring that would allow each discipline to prescribe prescription-only medications. Draft language has not been received, but the Association will follow this issue closely. At this time, the Association has concerns about the concept of these proposals, but will not take a formal position on the initiatives until draft language is available for review.

Mark Boesen
AzaPA Legislative Affairs Committee Chair
legislative@azpharmacy.org

Jeff Gray, R & R Partners,
AzaPA Lobbyist
When is Too Much, Too Much?
by Rich Cieslinski, R.Ph., Arizona State Board of Pharmacy

“Valley Forge, PA., April 24, 2007- AmerisourceBergen Corporation today announced that the U.S. Drug Enforcement Administration (DEA) has temporarily suspended the Orlando, Florida Distribution Center’s (DC), license to distribute DEA controlled substances and listed chemicals. The temporary suspension affects only the Orlando DC and only DEA controlled items. The DEA asserts that AmerisourceBergen did not maintain effective controls against diversion of controlled substances, specifically hydrocodone, to four internet pharmacies from January 1, 2006 through January 31, 2007.”

“Washington, October 2, 2008- Cardinal Health Inc., one of the nation’s largest distributors of pharmaceutical drugs, has agreed to settle allegations that it violated federal reporting provisions relating to its handling of certain controlled substances regulated by the Drug Enforcement Administration (DEA). Under the agreement between the company and seven U.S. Attorney’s Offices, Cardinal Health agreed to pay $34,000,000 in civil penalties for alleged violations of its obligations under the Controlled Substances Act.”

“New Jersey, August 9, 2012- Federal prosecutors and agents have issued two subpoenas to drug wholesaler AmerisourceBergen Corp. involving company procedures for monitoring the distribution of narcotic painkillers and other controlled medications that are subject to broad abuse.” The article goes on to say that, “McKesson paid more than 13 million in civil penalties in 2008 for not reporting suspicious orders of prescription drugs from 2005 to 2007, according to the Justice Department. The three distributors—Cardinal, AmerisourceBergen and McKesson Corp. have more than 95% of the industry share and in response, the distributors have launched more vigilant tracking programs and conducted their own investigations of suspicious purchases.”

I recently received a call from a pharmacist working in a chain store in Northern Arizona who had some general pharmacy-related legal questions to ask. After answering all his questions, he had one final comment he wanted to express to me and the Board before finishing the call. He wanted to state that he felt it was completely unfair for pharmacies to be limited in the quantities they ordered of controlled substances, specifically Schedules 2, 3 and 4’s, for volumes necessary to meet the needs of their legitimate patients, when the wholesalers or distributors had no idea of his patient’s specific needs. He went on to say that he was very familiar with the prescribers in his area and all the patients that came into his pharmacy. Additionally, he wanted to state that he felt his patients would have to turn to other questionable sources to get their controlled substances if they could not get it legitimately from him, and he was very concerned about that.
When is Too Much, Too Much? (continued from page 11)

Lastly, there is a section entitled, “Suspicious Order Reporting System for use in Automated Tracking Systems” that has a voluntary formula for use by distributors to wholesale and retail levels. The formula calculates the quantity which, if exceeded in one month, constitutes an order which may be considered excessive or suspicious and requires reporting to the DEA. The formula calculates the maximum amount that the customer can order per month and uses purchase quantities for the last 12 months within the same Distribution Center and for customer type.

The guidelines are intended to assist chemical manufacturers, distributors, wholesalers, and retailers to be alert to suspicious orders and clearly indicate that granting a DEA registration only indicates a proper application, the establishment of a records system and the required security system for the on-site inspection, and doesn’t confirm proper future business activities. It does not relieve the manufacturer, distributor, wholesaler, or retailer of the responsibility to evaluate all transactions.

From the numerous headlines available, like those listed at the beginning of this article, it is easy to see why distributors and wholesalers have begun to scrutinize and limit or curtail quantities of controlled substances ordered by pharmacies. It appears that from the research information used in this article, distributors and wholesalers may not have been doing or following recommended DEA guidelines from the beginning. It appears that the tide has changed. No one specific factor could be found that explains why a quantity of controlled substance is to be limited or not provided to the pharmacy ordering the controlled substances, but an aggregate of items instead.

CSPMP Now Paperless, Online

Arizona Board of Pharmacy’s Controlled Substances Prescription Monitoring Program (CSPMP) has been collecting data from dispensers of Schedule II, III, and IV Controlled Substance prescriptions since October 2008. The CSPMP database has been available for use by medical practitioners and pharmacists since December 2008. Medical practitioners who are registered with the CSPMP as required by law may request access to the CSPMP database to look up their patient’s prescription information to treat or evaluate their patient. Pharmacists who are licensed may also request access.

Since December 2008, the process for requesting access required the medical practitioner or pharmacist to complete paper forms, one that required notarization. Those documents with other verifying documents had to be mailed to the CSPMP office for processing. On October 22, 2012, the process went online and paperless. Medical Practitioners and Pharmacists can log into an online application to request access to the CSPMP. Here is the link to request access online: http://azpharmacy.gov/pmp/access.asp. Medical Practitioners and Pharmacist will still need to complete the CSPMP’s online training course and will receive an email from the training course at CareerMap after completing the online access request. Once the medical practitioner or pharmacist completes the training course (about 15-20 minutes), the medical practitioner or pharmacist will receive two emails from the CSPMP’s tech staff at Health Information Designs, Inc (@hidinc.com) with their user name and database web link and their PIN number, temporary password, login instructions, and an 866 help desk phone number.

Medical practitioners and pharmacists who are not licensed in Arizona can still request access online, but they must print out the online forms, have the forms notarized and mail the forms to the CSPMP office along with a copy of the applicant’s current State License, (for Medical Practitioners their DEA Registration), and Driver’s License. Once all documents are received and verified, the out-of-state licensed medical practitioner or pharmacist will receive the email from the online training course at CareerMap. Once the out-of-state licensed medical practitioner or pharmacist completes the training course, the out-of-state licensed medical practitioner or pharmacist will receive two emails from the CSPMP’s tech staff at Health Information Designs, Inc (@hidinc.com) with their user name and database web link and their PIN number and an 866 help desk phone number.

Any questions can be directed to PMP Director Dean Wright at 602-771-2744 or email at dwright@azpharmacy.gov or PMP Manager Richard Cieslinski at 602-771-2732 or email at rcieslinski@azpharmacy.gov.
We Need More Mentors in America Today  
by Wayne W. Oliver, Vice President of Pharmacy Advocacy &  
Governmental Relations, RxAlly

Giving back. Paying it forward. We’ve all heard these expressions when talking about those who have experienced random acts of kindness like paying for the next driver’s toll or buying a stranger a cup of coffee. They are always appreciated and always bring an immediate smile to the face of the benefactor.

But, when someone has had such a profound influence over the way you critically think, over the way you process information and over the way you respond to life’s daily opportunities, that person is a mentor. We need more mentors in America today.

People walk into and out of our lives on a daily, weekly, monthly basis. But, mentors and their lessons last a lifetime. We should not discount the importance of mentors and of mentoring.

My first mentor, Larry Braden, was recently recognized by the National Community Pharmacists Association (NCPA) Foundation for his lifelong dedication to advancing pharmacists and, more specifically, to helping to reshape independent community pharmacists. I worked with Larry for ten years and he taught me the importance of active listening, effective communications, and deliberate reasoning. He also taught me you could do all of these things while be a gentleman. He is a consummate gentleman and has lived by the principles of being a gentleman – being respectful, honest, humble, civil, and staying strong – are all lifelong lessons. He is a much better gentleman than I will ever be. Thanks Larry.

Another mentor is former US House Speaker Newt Gingrich and founder of the Center for Health Transformation (CHT). Former Georgia Governor Sonny Purdue once described listening to Newt’s ideas as being as overwhelming as drinking from a fire hose. As the head of a hybrid think tank, consulting, and public policy shop, Newt taught me the importance of critical – virtually disruptive – thinking and of being articulate, especially in drawing a clear distinction between policy value propositions. Newt also taught me that communications take lots of forms ... from blogging and social media like Twitter to traditional op-eds, print, TV and radio interviews. Equally as important, he taught me that people receive information from a broad array of traditional and non-traditional sources and that to be an effective communicator, you must deploy strategies aimed at all of those sources ... not just those with which you’re comfortable. Thanks Newt.

Andy von Eschenbach, M.D., is another of my mentors. Andy is a former Commissioner of the Food & Drug Administration (FDA) and former Director of the National Cancer Institute. Andy taught me about the importance of life balance between work, family, faith, fun and service. Andy lives it daily. As a dedicated husband, father, grandfather, and an accomplished surgeon at MD Anderson, Andy still found the time and energy to serve his country at the highest level while still balancing his family, his faith, his causes, and his passions. And, he reinforced the importance of service with grace and dignity. Thanks Andy.

As I approach the end of this post, please consider taking a young associate under your wing and serve as a mentor. Similarly, if you are a young person, find someone you genuinely respect and spend time with them. We need more mentors in America today to help shape the future of our country.

And, here’s the cool part. When you serve as mentor, you get so much out of it than you would ever expect. Over the years, I have been privileged to work with many talented young people. It is so very rewarding to watch the careers, the families, and contributions of those who I hope think of me as their mentor. Thanks Chris, Ashley, Rebeccia, Kelly, Matt, Kimberly, Liz, Vince and Lee for allowing me to be a part of your life.

We need more mentors to pass along lifelong lessons ... important lessons like being respectful, honest, humble, and civil ... lessons like creative, critical thinking and being deliberately articulate when we communicate ... lessons like of the importance of life balance between work, family, faith, fun and service.

We need more mentors in America today.

This article originally appeared on the Atlanta Journal Constitution blog and is reprinted with the author’s permission.

Arizona Pharmacy Association  
Mentor Connection Program

The AzPA Mentor Connection Program (AzPA MCP) provides the opportunity to build relationships, further professional networks, and strengthen continuous professional development on behalf of both mentors and mentees. The scope of this program supports AzPA’s vision of empowering pharmacy professionals to provide optimal patient care.

AzPA MCP Program Goals

• Promote personal and professional development of pharmacy students beyond curricular goals  
• Provide direction, foster confidence, and instill values needed to develop professionally  
• Create an engaging environment that instills renewed enthusiasm within the profession  
• Cultivate long-term relationships that evolve with time and are mutually beneficial

Participation as a mentor or a mentee is open to all Arizona Pharmacy Association pharmacist (mentor) and student pharmacist (mentee) members.

For more information about how to be a part of the AzPA MCP, contact Kelly Ridgway, AzPA CEO at kelly@azpharmacy.org
Flagstaff Pow Wow
by Joe Rowan, R.Ph.

In 1960, I submitted my resignation to the Gunning Casteel Drug Store Company to venture into my own pharmacy business in Flagstaff, Arizona. This was quite an emotional time for me and both Mr. Casteel and Mr. Gunning, realizing that one of the boys who spent 20 years with their organization (including high school and college) was about to depart. Both were very encouraging yet assured me that there would always be a place for me with G & C should things not work out the way I anticipated. While they and I were confident that this would probably not be necessary, it was very reassuring to know that I could always “go home.”

About a week prior to my departure, all of the G & C store managers hosted a going-away supper and party in my honor and presented me with an engraved gold watch. None of the company brass was invited to this get together; it was managers only and all were in attendance. I was the first manager to receive this accolade and I have always cherished the memories as well as the watch.

So in June, after receiving my annual bonus and a buy out of my G & C stock, I made a down payment on the Flagstaff Pharmacy. My father-in-law Jack Hughes matched my contribution and we became partners in the business. I prepared to depart for Arizona and left El Paso on June 23, 1960, in a little German Lloyd auto which would become our first delivery vehicle for the Flagstaff Pharmacy. Mims and the family would follow after the sale of our El Paso house was completed. Upon arrival in Flagstaff I set up housekeeping in the Commercial Hotel on Santa Fe Street right on old Route 66. Within a short time I purchased a house from a builder that had been used as a model. It was empty and ready for immediate move-in which was a good thing as Mims, Peanuts the dog, and the gang arrived before the end of June. Grandad Jack and Gramma Dorsey (Mims’ parents) arrived shortly thereafter and we all went to work in the pharmacy.

On July 1, 1960, we became the proud owners of the Flagstaff Pharmacy on the northeast corner of Santa Fe Avenue and Leroux Street. (Editor’s note: Collins Irish Pub now occupies this building.) On July 2, 1960, the annual All Indian Pow Wow, sponsored by the city of Flagstaff, began running through the 4th of July. This yearly affair featured parades, Indian dances, and a rodeo. For three days, visitors from all over the Southwest would descend upon Flagstaff, including the Flagstaff Pharmacy, making purchases of sunglasses, film, fountain treats, lotions, and other various travel needs. It was like Christmas – wall-to-wall shoppers. What a way to start a new business!

During the annual Pow Wow, three Indian men would come to our pharmacy and ask me to keep and protect the money they derived from selling their jewelry. Under no circumstances was I to return the money to them until the Pow Wow concluded. They were intent on a little carousing and other joyful festivities and they did not want to take any chances losing their nest egg during the celebration. I do recall that each one of the men had his money tied neatly in a bandana with a very distinctive knot securing it. It would have been impossible for me to duplicate the knot and each time they came back to claim their fortunes after the Pow Wow, they would first check the knot. Maybe I wasn’t as trustworthy as I thought. I accepted the honor of being entrusted with their money and this arrangement went on for many years.

Each year the Pow Wow injected a great shot in the arm to our bottom line as we specialized in tourist needs and capitalized on our location. During our 18 years in Flagstaff, we always looked forward to the annual festivities and I was proud to eventually become chairman of this great event.

This is the eighth installment in a series of reflections from Joe Rowan, R.Ph., longtime Arizona pharmacist and AzPA member. Follow Joe’s memoirs in future issues of the Arizona Journal of Pharmacy or catch up on past installments by visiting the Arizona Journal of Pharmacy archives on the AzPA website.

Rowan’s Flagstaff Pharmacy circa 1970

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Phrenology is a very ancient art. Aristotle was the first philosopher to locate the mental facilities and the emotions in the head. The study of phrenology is the “science” that examines the relationship between an individual’s skull morphology and their behavior.

An Austrian physician, Franz Joseph Gall (1758-1828), established phrenology as a science and laid the foundation, after careful observations and measurements, for the precise locations of a person’s faculties in specific brain areas. The heyday of the pseudoscience of phrenology was between 1820 and 1850. It was discredited, but remained an influential doctrine until the end of the 19th century in England and the United States.

Authentic ceramic phrenology heads, similar to the one pictured here, are very rare to find. This is a very fine example that dates to the late 19th century. There are a limited number of fine reproductions available for display, but sometimes unscrupulous dealers sell them as antiques.

1988—Twenty-five Years ago:
- Medicare Catastrophic Health Care Act passed by Congress but repealed also immediately after outcry by a grounds swell of negative reactions.
- Board of Pharmacy Specialties (BPS) recognizes Pharmacotherapy and Nutritional support as pharmacy practice specialties.

1963—Fifty Years Ago:
- The first measles vaccine was licensed for use in the U.S. in 1963. John Enders developed the vaccine from a strain of measles isolated by Thomas Peebles.
- Valium (diazepam) marketed by Hoffman-LaRoche.

1938—Seventy-five Years Ago:
- The Federal Food, Drug, and Cosmetic Act was passed in response to deaths from the use of Massengill’s Elixir of Sulfanilamide
- Albert Hofmann of Sandoz Laboratories in Switzerland synthesized LSD (lysergic acid diethylamide).

1913—One hundred Years Ago:
- Alaska passed territorial practice act.

1888—One hundred twenty-five Years ago:
- First class of pharmacy students enrolled in the South Dakota State College (then the State Agricultural College) in Brookings, SD.

One of a series contributed by the American Institute of the History of Pharmacy, a unique non-profit society dedicated to assuring that the contributions of your profession endure as a part of America’s history. Membership offers the satisfaction of helping continue this work on behalf of pharmacy, and brings five or more historical publications to your door each year. To learn more, check out www.aihp.org.

A how-to-guide for conducting an MUE from the student perspective

by Kasidy McKay Pharm.D. Candidate 2013, Kyle DeWitt Pharm.D. Candidate 2013, Kristen Sensen Pharm.D. Candidate 2013, Linda Trinh Pharm.D. Candidate 2013, Lindsay E. Davis, Pharm.D., BCPS Midwestern University College of Pharmacy - Glendale

Introduction

As students on advanced pharmacy practice experiences (APPE), we hope to not only gain knowledge, but to meaningfully participate in patient care and assist our preceptors in completing their daily tasks with a goal of learning the skills necessary to be effective practitioners. With the progression of the field of pharmacy and the increase in competitiveness for postgraduate education positions, most students eagerly seek unique and valuable opportunities while on their rotations. One of these unique opportunities is participation in the process of medication use evaluations.

Background

During our six week rotation at Banner Estrella Medical Center (BEMC), we were able to facilitate the design, data collection and data analysis of an MUE from start to finish. Our preceptors at BEMC had recognized a potential disconnect with evidence-based guidelines and facility practice in regards to the use of vitamin K for warfarin reversal in cases of elevated INR or presence of active bleeding. We were asked to design an MUE assessing vitamin K use for warfarin reversal at BEMC.

Our approach

Collectively, we had no experience with MUE design, and were even unsure on the difference between an MUE and a DUE, so we began the process by first defining an MUE as a “performance improvement method that focuses on evaluating and improving medication use processes with the goal of optimal patient outcomes.” In contrast, a DUE looks specifically at prescribing patterns and assesses appropriateness of medication use. An MUE encompasses the objectives of a DUE but places a focus on assessing and ultimately improving patient outcomes and quality of life associated with medication use. Because MUEs focus on patient outcomes, it is vital that an interdisciplinary approach be taken when completing an MUE. With this information in mind, we began designing our MUE.

Given that our MUE was assessing warfarin reversal with vitamin K for supratherapeutic INR or active bleeding, we decided to utilize the 2012 American College of Chest Physicians (ACCP) CHEST guidelines to define the appropriate clinical course for a given patient scenario. In cases not addressed by the guidelines we looked to other resources including Anticoagulation Therapy: A Point of Care Guide published by the American Society of Health System Pharmacists, as well as primary literature sources where available. When constructing an MUE, it is critical to build the framework of the project such that it is supported by unbiased drug information, peer-reviewed literature and practice guidelines. Credibility and medical staff acceptance of the MUE results relies on using criteria that have been developed using evidence-based medicine and consensus amongst key stakeholders.

A vital step in the preparation of our MUE plan was to create assessment criteria (i.e., statements that define correct drug usage or medical practice) and set thresholds (i.e., benchmarks) that define practice expectations. Our criteria included an assessment of medication use appropriateness and associated patient outcomes. With regard to assessment of medication use, an example criterion we established evaluated the appropriateness of the dose of vitamin K administered for a given clinical scenario. An example criterion we established assessing patient outcomes quantified the number of patients who developed a thrombosis after administration of vitamin K. (See Figure 1 for criteria set for our MUE.) The majority of our thresholds were set at 100%. This implies that we determined that these criteria should be met for all encountered cases and any deviation from this would provide an opportunity for practice improvement. Thresholds set at anything other than 100% (i.e., fully compliant) or 0% (i.e., a practice that should not be instituted) imply that some deviations from the criteria may be clinically justified or are likely to be random occurrences.

We utilized the 2012 CHEST guidelines to create a treatment algorithm to assess each patient case, and used a letter coding system to establish if criteria were met in each scenario. (See Figure 2 for our treatment algorithm.) A data collection sheet was also prepared and checked against the preset criteria to ensure that the data necessary to assess our criteria were collected. Doing this made data analysis straightforward because we collected only the data we knew we needed and did not have to decide what we wanted to report after the data was collected.

We prepared a formal document with a purpose statement, referenced background, planned process for data collection, detailed table of our criteria and thresholds, treatment algorithm, evidence-based reference list and our data collection tool. This step was important for a few reasons. In addition to having a polished document to present to our “champion,” it helped the project feel formal and meaningful and served as the template for our final report.

As we discovered in our early research regarding the difference between an MUE and a DUE, it is important that there be a multidisciplinary approach to MUEs. If there is no physician buy-in starting with the development of an MUE, there may be reluctance to accept changes and proposed education based on the MUE findings. Additionally, it is helpful to have a specialist assist in the process simply due to the knowledge and clinical experience they can contribute. We asked a hematology/oncology physician at BEMC to review our plan, criteria and thresholds as well as be our “champion” when it came time to make proposals based on the MUE results.

We identified patients who received vitamin K during a specific time frame using a pharmacy-generated report and split the patient list between each group member. The data collection sheet was piloted to increase standardization of data interpretation and collection by having each data collecting group member complete the same three patient cases and then, as a group, discuss how each person characterized the clinical scenarios and why. If we found during data collection that a clinical scenario
The Best of Both Worlds (continued from page 16.) was ambiguous, it was discussed by the group and characterized based on group consensus.

We found the data analysis process surprisingly easy to perform and attribute our success to having had our comprehensive MUE plan polished prior to beginning data collection. Our evidence-based treatment algorithm was created specifically to address the criteria and this made analysis straightforward. Microsoft Excel was utilized to analyze the data and we agree that the most difficult portion of this step was familiarizing ourselves with formulas and functions of Excel. In some instances, there will not be enough data available to assess a given criteria. We experienced this in the process of our data analysis and simply reported that we were unable to assess these criteria.

Having created a solid plan, writing the final report was streamlined. We used our plan as a start point and added the following information based upon our results: classification of excluded patients by reason for exclusion, description of the included patient population, compliance rates for the criteria, discussion of the results, and recommendations for the facility to correct any issues identified through the MUE.

As our rotation was only six weeks long, we were not able to participate in this step of the process. Presentation at a pharmacy and therapeutics committee meeting or a similar venue is a vital step in the MUE process because it makes those in a position to make changes within the facility aware of areas needing improvement. Methods to achieve needed improvements can include provider education and computerized ordering prompts to ensure accurate use of a medication. Positive findings (i.e., meeting threshold goals) should also be highlighted and can provide support for programs and clinical services. It is also important to re-conduct the MUE at a later date to assess the efficacy of implemented changes.

How MUEs advance pharmacy practice

Working as a group of students, we were able to complete the task promptly, increasing time efficiency. As most hospitals have a limited workforce available to dedicate to projects such as MUE’s, allowing students to assist in the process can be beneficial to sites and assist in the advancement of pharmacy practice. Because the data collected through the MUE process is specific to the site, it will highlight the areas that a particular facility can improve upon. Most importantly, patients benefit from MUEs because, by their nature, they are intended to improve outcomes associated with medication use.

Facilitation of learning (benefits to students)

Completing an MUE taught us how evidence-based medicine relates to actual clinical practice. Going through this process not only enhanced our knowledge on the subject, but also exposed us to the practical and logistical side of following through with guideline recommendations. The process of data collection was a tool that enabled us to adapt quickly to the sites electronic medical record and sift through patient charts with higher efficiency. The time spent analyzing charts allowed us to see real-life clinical practice and required us to utilize critical thinking skills to determine why certain choices were made based on a patient scenario. We became more aware of how assessment of medication use can be utilized to influence hospital policy and practice.

Conclusion

Allowing APPE students to participate in the MUE process can be beneficial for both the student and the site. When preceptors focus on teaching students the process and purpose of an MUE, as was the case in our experience, students will leave the rotation with a newly developed skill set and deeper understanding of pharmacy practice. Similarly, the site will have the data necessary to improve patient care and initiate needed changes in medication use: the best of both worlds.

Acknowledgements: Special thanks to BEMC for supporting our learning through providing guidance, mentorship, and time. We recognize and appreciate the value your facility plays in our development as pharmacy professionals.

Figures for this article appear on page 18.

References
Figure 1.
Criteria table for the MUE completed at BEMC looking at the use of vitamin K for the reversal of supratherapeutic INR or bleeding

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Threshold (%)</th>
<th>Compliance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. For all patients on warfarin therapy with either a supratherapeutic INR or active bleeding, the warfarin dose was held or reduced</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>2. Management of a supratherapeutic INR or active bleeding secondary to warfarin therapy were in alignment with the 2012 Chest Guidelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Minor Bleeding</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>b) Major bleeding</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>c) No bleeding &amp; INR 3 - 4.5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>d) No bleeding &amp; INR 4.5 – 10</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>e) No bleeding &amp; INR &gt; 10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3. Appropriateness of administered vitamin K dose for clinical scenario</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>a) Oral vitamin K administered</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>b) IV vitamin K administered</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>4. Appropriateness of route of vitamin K administration</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>a) All patients who received IV vitamin K had major bleeding or were NPO status</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>b) Patients without major bleeding who were able to take medications by mouth received oral vitamin K</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>c) Patients received subcutaneously or intramuscularly administered vitamin K [this is considered an inappropriate practice]</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5. Appropriateness of procoagulant administration to achieve rapid hemostasis for warfarin reversal (i.e., FFP, Cryoprecipitate, Factor VIIa)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Procoagulants only utilized in cases of major bleeding or to bridge vitamin K when emergent procedure required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Patients with major bleeding</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>ii. Patients with minor or no bleeding requiring INR reversal for an emergent procedure</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>b) Dose of procoagulant appropriate</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6. Thrombosis avoided (i.e., VTE, CVA, intracardiac thrombus)</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.
Treatment algorithm for the MUE completed at BEMC looking at the use of vitamin K for the reversal of supratherapeutic INR or bleeding.
Making Arthritis Painless for You and Your Patients
by Angela Gohlke, Dustin Ingraham, Ronald Obrique, Pharm.D.
Candidates, Class of 2013, Midwestern University College of
Pharmacy - Glendale and Mindy (Throm) Burnworth, Pharm.D.,
BCPS, Associate Professor, Midwestern University College of
Pharmacy - Glendale, AzPhA Health-System Academy

Pharmacy is a continually-evolving discipline. New
medications emerge, some treatments become obsolete, and
the patient population continues to change. Currently, there is
a greater influx of baby boomers into the health care system.
Additionally, the overweight and obese population is increasing
exponentially. Thus, it is not a surprise that diseases which are
associated with age and weight are also on the rise - one of them
being joint disease. The two most prevalent are rheumatoid
arthritis (RA) and osteoarthritis (OA), which have similarities
and unique differences.1,2 Having a good understanding of both
disease states will ensure you are providing patients with optimal
treatment to improve their quality of life.

It is important to distinguish between the pathophysiology
of RA and OA, as it determines the treatment approach.
RA is a systemic, inflammatory joint disease that involves
autoimmune destruction, while OA is a localized deterioration
of cartilage caused by “wear-and-tear.”1,2 RA is a chronic and
progressive disease that causes pain, stiffness, swelling, and
limited motion. It is the most common autoimmune arthritis
and is most prevalent in women, who comprise about 75% of
RA patients. The primary cause of the disease is unknown but
theories suggest genetics, environment, and age may play a role.
In RA, the immune system is dysregulated and inappropriately
targets the synovial tissue lining the joint capsule. The joint
tissue lining proliferates and invades cartilage and bone, which
leads to joint destruction and subsequent deformity.1
Patients with RA generally have a longer duration of morning
stiffness (greater than 30 minutes) compared to patients with
OA (less than 30 minutes). In addition, RA patients experience
symmetrical pain and stiffness in the proximal interphalangeal,
metacarpophalangeal, wrist, and metatarsophalangeal joints,
while OA patients experience asymmetrical pain in the distal
interphalangeal, proximal interphalangeal, and hip joints.1,2
Since RA is a systemic and immune-mediated disease, patients
can have an elevated erythrocyte sedimentation rate (ESR) which
is a test that indirectly measures how much inflammation is in
the body. Also, most RA patients (~60-70%) are positive for
rheumatoid factor (RF), which is an autoantibody. However,
these lab results do not provide a definitive diagnosis for RA as
there is no single test for diagnosis. Diagnosis involves assessing
joint involvement, serology, markers of inflammation, and
duration of symptoms.1

Since the clinical manifestations of RA are immune-mediated,
it is logical that treatment targets the inflammatory pathway.
Goals of treatment are to initiate pharmacotherapy early (within
three months of diagnosis), prevent joint damage, prevent loss
of function, decrease pain to a tolerable level, strive for disease
remission, and minimize adverse drug reactions (ADRs).1,3
Pharmacological treatment options for RA include non-steroidal
anti-inflammatory drugs (NSAIDs), corticosteroids, and a general
class of drugs called disease-modifying antirheumatic drugs
(DMARDs) which are further broken down into synthetics and
biologics.3 The American College of Rheumatology (ACR) has
published guidelines for the use of DMARDs in RA.4 NSAIDs
help manage symptoms but do not prevent cartilage damage.1
The onset of their analgesic effect is rapid (30 to 60 minutes),
while their anti-inflammatory effect may take longer to be
complete (two to four weeks).5,6 Furthermore, higher doses are
needed for anti-inflammatory effects.5 Corticosteroids, on the other hand, are immunosuppressive and can slow the
progression of RA in addition to reducing joint inflammation
in acute flares. If corticosteroids are used for greater than
two to three weeks, tapering the dose is necessary before
discontinuation. Corticosteroid use is not recommended for
longer than six months due to the long-term adverse effects
e.g., osteoporosis, skin thinning, weight gain, hypertension,
hyperlipidemia.7 DMARDs are considered first-line treatment
for RA as they delay the progression of the disease and achieve
remission. They reduce joint pain and swelling, decrease markers
of inflammation, limit progressive joint damage, and improve
patient functioning.1,3,4

Synthetic DMARDs like methotrexate, hydroxychloroquine,
sulfasalazine, and leflunomide can be used as monotherapy or
as combination therapy of up to three medications. Depending
on the disease severity, a trial period of three months is given to
test for efficacy. If the patient does not experience relief after
the initial three months of therapy, another DMARD can be
added or the patient can be switched to an alternative DMARD.4
DMARDs take one to two months to reach therapeutic effect;
therefore, bridge therapy is needed which combines a DMARD
with an NSAID and/or a corticosteroid to provide immediate
pain relief.1,3,4 There is no “one-size-fits-all” approach to RA
therapy and treatment needs to be individualized. It is important
for pharmacists to be aware of the clinical pearls surrounding
each of the synthetic DMARDs in order to provide optimal
patient care. Methotrexate, the first-line synthetic DMARD,
has several counseling points to be aware of. First, it requires
concomitant folic acid to decrease ADRs such as gastrointestinal
intolerance, stomatitis, hepatic fibrosis, and cirrhosis. In addition,
patients should be instructed to avoid alcohol while taking this
medication and to use a reliable method of birth control due to
teratogenicity in males and females.8 Hydroxychloroquine is
typically a second-line agent that is known to cause macular-
retinal damage, necessitating regular eye exams. Furthermore,
it should be taken with food to reduce the common complaint of
nausea.9 Sulfasalazine has several counseling points including
photosensitivity, sulfa-containing (be aware of allergies),
discoloration of urine, as well as several drug interactions.10
Lastly, when taking leflunomide it is necessary to inform patients
to avoid alcohol and that this medication is teratogenic in males
and females.11

It is important to distinguish between the biologics and the
synthetic DMARDs previously discussed. Tumor necrosis factor
(TNF)-inhibitors are most common and include etanercept,
adalimumab, golimumab, and infliximab; the remaining biologics
have different mechanisms of action and include anakinra,
abatacept, rituximab, and tocilizumab.1 Second, unlike the
synthetics, the biologics cannot be used in combination with each
other, but can be used with synthetics such as methotrexate.1,3,4
Biologics are given as subcutaneous injections or intravenous
infusions depending on the agent chosen. Biologics have many
that when patients are purchasing this supplement, they look for the green and gold “USP Verified” symbol in order to ensure potency, lack of contaminants, dosage form breakdown in the body, and production according to FDA good manufacturing practices.

As the American population continues to age and becomes more overweight, the incidence of RA and OA will continue to rise as well. Staying informed of changes to treatment recommendations helps pharmacists play a key role in patient health care and outcomes. Patients count on pharmacists for reliable drug information. Thus, it is our duty as the drug experts to provide exceptional care and use our knowledge to help make arthritis painless for everyone.

References:
2012 AMCP Educational Conference: A Student Perspective

by Alex Dong, Pharm.D. Candidate, University of Arizona College of Pharmacy Class of 2013

As a student interested in managed care, an advisor recommended that I attend the Academy of Managed Care Pharmacy’s 2012 Educational Conference held October 3-5, 2012 at the Duke Energy Convention Center in Cincinnati, Ohio. The conference included sessions focused on current managed care topics, networking opportunities, and keynote speakers.

I started the conference with the welcome breakfast for new members and first time attendees, then headed to my first session: “Medicare Fraud: How to Develop a Credible Allegation of Fraud”. A panel of pharmacists and lawyers discussed their roles in their respective organizations and their experiences in identifying and combating fraud. They mentioned common fraud schemes such as diversion of high street value drugs, pill mills, and manipulation of rebates, and questions to ask in building a credible allegation such as “Does this relate to patients, providers, or pharmacies?”, “Does this involve one target or collusion between multiple entities?”, and “Is the purpose of the scheme to obtain money or pills or both?”. After this and the first general session, where former U.S. Senator Bill Bradley shared his thoughts on politics and the current health care system, I headed to “The Exchange” product expo, product theatre, and witnessed the managed care poster presentations.

Next, it was time for the Student Pharmacist Networking Luncheon. This was a great opportunity to meet fellow pharmacy students and current residents across the country from Michigan and Illinois to California and Utah. Soon after was the student-centered session “Residencies and Fellowships Post Graduation: Exploring Your Options and Standing Out in a Crowd”. The panel of speakers consisted of current and former residents sharing their experiences and advice on postgraduate opportunities. They recommended keeping one’s CV updated and having an “elevator speech” ready. They also mentioned that the key to networking is exposure and to take people up on offers they may make because so few people do and it will make that person standout. This session was incredibly valuable as a student to refresh what I knew and to learn new things.

Then I was off to the Residency Showcase with this knowledge in hand. This particular showcase was great because all the programs were specifically for managed care residencies and fellowships. There were also less students here than at other meetings such as ASHP’s Midyear, which meant more time could be spent talking with the directors and residents. I made the mistake of attempting to talk to all 36 programs at the showcase in 90 minutes, but it turned into a blessing. While I did not get a chance to speak with every program I was interested in, I was able to talk with programs I did not even consider or know about and are now sites that I am seriously considering.

The conference concluded with keynote speaker Janine Driver, CEO of the Body Language Institute. As a nationally recognized body language expert, she analyzed celebrity behavior and pointed out the things they were doing right and wrong. She also called upon numerous volunteers from the audience to help illustrate her points on body language. I wasn’t sure what to expect at first, but it became clear that she had valuable information to provide for us in our professional and personal lives and was a very entertaining speaker.

This experience was incredibly informative and valuable. I would definitely recommend this conference to anyone that is in managed care or associated with the field to some degree, and it is great for students for the residency showcase and other specific student-oriented programming. If you are interested in managed care and can’t make it to one of these conferences, remember that you can still get involved by joining the AzPA Managed Care Academy.
Lessons Learned: Political Advocacy & Leadership

by Ronni Nemeth, Joyce Buchanan, Kali Jo Finn, Taylor Jackson, Pharm.D. Candidates, Midwestern University College of Pharmacy - Glendale Class of 2014
Dawn Knudsen Gerber, Pharm.D., CGP, Associate Professor
Midwestern University College of Pharmacy - Glendale

During the fall 2012 quarter at Midwestern University College of Pharmacy-Glendale, we participated in a political advocacy and leadership elective. The underlying theme for the entire course was finding the value of your own political participation. We may not have all come in with the same mindset about pharmacy politics but we all left with the motivation to have our voices heard. If we don’t become actively involved in the process, someone else with less knowledge and passion for our profession will. For example, we were surprised to learn that there were 10 proposed pieces of legislation in the 2011-2012 term that directly or indirectly affected the field of pharmacy just in Arizona alone. All of the leaders in the profession we interacted with during the class left us with the same piece of advice that they learned throughout their own political advocacy journey: “it doesn’t take a majority to prevail, but rather an irate, tireless minority.” (Samuel Adams) We too, left with our own lessons that can apply to everyone in the profession of pharmacy, not just the most politically active.

Special thanks to Crane Davis, Mike Dietrich, Linda Baker, Mark Boesen, Mike Blaire, Kelly Ridgway, and Secretary of State Ken Bennett.

If Not Me, Then Who?
By Joyce Buchanan

We must advocate for what we want and believe in for our pharmacy profession because complacency will not lead to a change that we desire. We hear the phrase “pharmacy is a small world” over and over again. Because we are a profession small in number, we need to come together to be loud and vocal in order to communicate who we are, what we do and how sharing our knowledge benefits patients, physicians, insurance companies and other aspects of healthcare. While many healthcare professionals truly welcome the medication expertise of a pharmacist, few seem to know the intricacies of our profession. When a physician I interviewed said, “pharmacists don’t know how to read or order labs” I realized the need to educate even those we work with on a daily basis that we learn about the same disease states including symptoms, diagnoses, labs, and procedures that medical students do, but our focus is on the judicious selection of appropriate and rational drug therapy, derived from evidence-based medicine guidelines.

Advocating our value to other healthcare professionals as well as the general public is a great way to promote our profession. What good is it if I become a professional and do not know how to convey and maintain my value?

Advocacy is For Everyone
by Ronni Nemeth

Being an advocate for the pharmacy profession wasn’t something I had in mind when I applied to pharmacy school. I knew pharmacy was changing and I was motivated to learn how to follow the progress, but I did not realize I wanted to be apart of that progress. Since starting my own advocacy journey I have recognized the fact that we all don’t have to become the next AZPhA president, but we do owe it to ourselves and our profession to help pharmacy move forward and progress into the future. The world of pharmacy is a very dynamic environment on the verge of transformation and it is important to realize pharmacy is for everyone, with plenty of opportunities and levels of involvement. With so much of the proposed legislation dealing in the realm of healthcare, it is imperative to stay abreast with current information for both ourselves and our patients.

What does the PharmD brand mean?
By Kali Jo Finn

Dr. Crane Davis introduced us to the concept of branding. Apple, Wal-Mart, and Coca-Cola, each of these brands are famous all over the world and each of them carries with it more than the product from these companies. What then does our collective brand within pharmacy, namely PharmD, carry with its title? What individual responsibilities does each of us have in upholding the brand name of our profession? Since we are not selling a product, our brand is based upon what our patients expect to receive while in our care. To me, being a PharmD entails maintaining integrity with our patients and other healthcare providers, being reliable and creating a relationship with our patients so they know we will be their advocates. All in all, being a PharmD requires us to play for the letters at the end of our name, not the ones in front of it. By doing this we will unite together under these values and make our brand as ubiquitous as Apple, Wal-Mart, and Coca-Cola have.

Applying Leadership to Everyday Life
By Taylor Jackson

Both Dr. Michael Dietrich and Dr. Crane Davis spoke to our class on leadership emphasizing how integral it is to be a well-informed and well-rounded citizen and student. Dr. Dietrich emphasized how important is to be a well-informed and well-rounded citizen and student. Dr. Davis emphasized how emphasized us the importance of saying yes to opportunities even when you may not always feel ready or qualified. Something I believe can resonate with anyone. Dr. Davis emphasized how emphasized us the importance of saying yes to opportunities even when you may not always feel ready or qualified. Something I believe can resonate with anyone. Dr. Davis emphasized how emphasized us the importance of saying yes to opportunities even when you may not always feel ready or qualified. Something I believe can resonate with anyone. Dr. Davis emphasized how emphasized us the importance of saying yes to opportunities even when you may not always feel ready or qualified. Something I believe can resonate with anyone. Dr. Davis emphasized.
The Election is Over, but You Can Still Make a Difference
by Gina Buiocchi, Pharm.D. Candidate, Midwestern University College of Pharmacy - Glendale, Class of 2013

On the day after this past November’s election, I felt a collective sigh of relief from those around me that the barrage of political ads was finally over. While I tend to agree that the mostly-negative messages did little for my understanding of the issues, I have a unique love for election season that most others do not share. As an undergraduate, I majored in political science and was active in campus organizations dedicated to encouraging others to be involved in the electoral process. When I began pharmacy school in a new state with a new group of friends, other priorities took over and I no longer devoted the same energy to being politically involved.

Over the past two years, however, I have learned that if there ever was a time or reason to be a political advocate it is now, as student pharmacists representing the future of our profession. At a time when health care reform initiatives bring opportunities for pharmacists to be represented as an integral part of the health care team, and as we push to move our profession away from a product-centered focus to a service-centered focus, there are more occasions and needs than ever for pharmacy professionals to be involved in the political process. While I am by absolutely no means anything but an impassioned amateur in this arena, I would like to offer a brief history of my experiences in the hopes that others may use it as a suggestion for getting involved:

Classes & Faculty. Midwestern University’s College of Pharmacy offers an elective course titled, “Leadership and Political Advocacy”. As a self-proclaimed political junkie, I enrolled for the class unsure of what it would entail. The class was, among other things, a series of presentations by guest lecturers on their experiences in pharmacy leadership or politics at the state or national level. We discussed Arizona statutes regulating the practice of pharmacy in the state and penned letters to national representatives asking for their support on a bill dealing with our profession. It was through this experience that I learned valuable information as to how and why to be involved in pharmacy advocacy. This is a great opportunity for someone who wants to be involved, but isn’t quite sure where to start. Even if you are unable to take such a class, there are faculty members and pharmacists in the community who will be able to help you figure out where to get started.

Pharmacy Day at the Capitol. This was an amazing experience on so many levels that I recommend it highly as an activity to anyone, even someone with zero desire to be involved in politics. The state legislators and their staff look forward to pharmacists and pharmacy students coming to the capitol, and I think the students really enjoy telling other people why pharmacy is so great! This event is a great opportunity to practice your blood pressure measurement skills, or to counsel someone on what their blood glucose readings mean. It was also a great way to let the legislators know how our practice of pharmacy has been influenced by recent bills and tell them why pharmacists can make such a positive impact in health care.

National Meetings. Attending national meetings and conferences is a great way to network and learn about a variety of pharmacy practice fields and opportunities. National meetings are also a great place to learn about what others think the future of our profession will look like and what we are doing to get there. I attended the APhA annual meeting in New Orleans this past spring, and between all of the receptions and lectures on hyponatremia, I managed to sneak in a few minutes to sit in on the student House of Delegates. These meetings take the ideas of pharmacy students that have been proposed at the Midyear Regional Meetings (MRMs) and allow students to vote on official policies regarding the student chapters. Meetings like this are a great reminder that our ideas count, even if we are just students, and that we can, and should, take responsibility for the future of pharmacy.

State Association. As I write this article, I am sitting at the completion of my six-week APPE rotation with the Arizona Pharmacy Association (AzPA). Throughout my time as a student, I have been a member of the association that represents pharmacy professionals in the state. I have attended state conferences and meetings, and now have had the opportunity for a behind-the-scenes look at what they do for us here in Arizona. Being a member of the organization has prompted me to be aware of the political happenings in our state that could affect my future profession, as well as has afforded me the opportunity to be involved with some great people in some great projects over the past few years. Being a member of AzPA, and being an active member of AzPA on campus and now through this rotation, I’ve learned of so many more ways that I can affect and benefit my profession and my future patients by staying engaged in our political system.

This list is in no way comprehensive of all the ways there are to be involved as a pharmacy student, but I hope that it serves as an inspiration point for a list of your own ways to be active. There are so many other pharmacists, technicians, and other pharmacy students in the state who motivate me to see all the great ways in which I can impact the profession, all I have to do is know the right people to learn from and have a desire to affect change. I hope that throughout our future careers, our generation can help to make the profession of pharmacy better than we found it, and help our patients receive optimal care, and advocacy for the profession is the key to open that door of possibilities.

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COMMUNITY PHARMACY ACADEMY

Over 850 cases of pertussis were reported in Arizona in 2011. There have already been over 800 cases reported along with one infant death so far in 2012. All pharmacy personnel and staff are asked to get immunized against pertussis to decrease the spread of this contagious disease. Please join the Arizona Pharmacy Association, a member of Arizona Partners Against Pertussis (APAP), in a statewide campaign to reduce pertussis exposure to patients. Your support of this initiative is crucial.

PHARMACISTS AND PHARMACY STAFF NEED THE VACCINE. Only 20% of health care providers in the US have received the adult vaccine for Pertussis (Tdap). All pharmacists and pharmacy staff play a crucial role in keeping themselves, their patients and families protected from pertussis. Health care personnel are nearly twice as likely to get pertussis as other adults, and if they catch it from one patient, they can spread it to other patients. This is of particular concern for infants under one year of age. According to the CDC, Tdap vaccination of adults reduces the incidence of pertussis in infants and others who are at high risk of complications of the disease. The ACIP recommends administering Tdap regardless of the interval from the most recent Td-containing vaccine, including persons 65 years and older.

WE NEED YOUR HELP TO REACH 100% of Arizona’s pharmacy professionals vaccinated with Tdap. Join the APAP Initiative to achieve a Pertussis-Free Workplace today! Visit www.whyimmunize.org or the AzPA website at www.azpharmacy.org for information on how you can participate in the campaign.

Kristin Calabro, Pharm.D.
Community Pharmacy Academy Chair
cpa@azpharmacy.org

GERIATRIC CARE ACADEMY

I hope you are enjoying a warm and sunny winter here in Arizona! I would like to welcome all members of the AzPA to our academy especially if they primarily work with the geriatric population or are interested in learning more about how to best treat these patients.

We have been busy as an academy attending meetings, seminars, and conference calls and we have begun planning the GCA meeting to be held on Friday, May 3rd, 2013. The focus of the meeting will be hot topics in preparing to take the Certified Geriatric Pharmacist exam. All members of AzPA are encouraged and welcome to attend.

The GCA holds conference calls on the 2nd Wednesday of each month at 12:00 PM. A 10-minute “therapeutic update” is offered at the beginning of each conference call discussing hot-topics and/or clinical issues affecting the geriatric patient population. We welcome all AzPA members to join in. If you would like to be included on the conference call or you would like to present an update please e-mail me at tstorj@midwestern.edu.

Finally, start planning for the 2013 ASCP Annual Meeting & Exhibition. It is scheduled for May 14-17, at the Walt Disney World Swan/Dolphin Resort in Orlando, Florida. Please go to www.ascp.com for more information.

As always, I am interested in new ideas for how to best serve the academy. If you have any ideas or questions please feel free to contact me.

Sincerely,

Tara Storjohann, Pharm.D., CGP, FASCP
Geriatric Care Academy Chair
gca@azpharmacy.org
With the excitement of the holidays around us I hope that each of you finds joy, peace and inspiration as we head into a new year. As I think ahead to 2013 and consider all that has been accomplished in 2012, I feel proud to be a part of our profession and the Arizona Pharmacy Association. The AzPA HSA continues to add value to Arizona pharmacy through our work in engaging members, planning timely continuing-education programs, participating in student mentorship through the AzPA Mentor Connection Program, conducting ASHP House of Delegate nominations and elections, and partnering with ASHP to move the Pharmacy Practice Model Initiative (PPMI) forward in our state.

I feel honored to have been able to attend the ASHP State Affiliate Presidential Officers Retreat that took place in Chicago in mid-November. There were 25 State Affiliate Leaders in attendance spanning the country from Arizona to Maine. This was a dynamic meeting consisting of 16 hours of presentations and discussions covering topics including membership engagement and recruitment, ASHP’s Task Force on Organizational Structure, and an update on ASHP’s PPMI. In addition to sharing information about the AzPA HSA with the group, I brought back many ideas to help advance our academy. I would encourage each of you to consider a leadership role in AzPA's HSA so that you have the opportunity to participate in events like this in the future. I have an optimistic feeling that many of the connections I was able to forge during this meeting will provide the basis for meaningful professional relationships in my future.

Do you know about ASHP’s PPMI? At the State Affiliate meeting I had the opportunity to learn about why this initiative is important for our profession. PPMI aims to advance pharmacy practice in hospitals and health-systems on a local, state and national level. To accomplish this, ASHP is collecting, disseminating and sharing “best pharmacy practices” in key areas so that, as a profession, we are optimally positioned for tomorrow’s health care environment. To achieve this goal, ASHP needs the partnership of all hospitals and health-systems… has your facility joined the initiative and completed a hospital self-assessment? Unfortunately, < 5% of Arizona hospitals have participated in the self-assessment survey thus far. The good news is that it is very likely that > 95% of our pharmacy departments are making progressive and meaningful changes to the way we practice. Participating in the self-assessment will help your hospital or health-system create a framework for success in providing efficacious, safe, and efficient patient care. Collection of this data on a national level will also provide the documentation to support the role of pharmacy and pharmacists as an integral part of the health care team to stakeholders. To learn more about the Pharmacy Practice Model Initiative, visit ASHP’s website at http://www.ashpmedia.org/ppmi/index.html.

In an effort to increase Arizona’s participation in PPMI, the AzPA is teaming with ASHP to engage our hospital pharmacy directors by inviting current ASHP President Kathryn Schultz to facilitate a Luncheon to be held on Friday, January 25, 2013. The purpose of this Health-System Pharmacy Leaders Forum meeting will be to discuss PPMI and how to continue to move Arizona pharmacy forward. In addition to being a national leader in pharmacy, Dr. Schultz is a director of pharmacy at Bethesda Hospital in St. Paul, Minnesota and is eager to connect with our Arizona leaders. If you are a pharmacy director in Arizona, be on the lookout for an invitation to this special event.

All pharmacists have a role in PPMI and many of you are working everyday to shape the future of our profession. Please consider sharing your “best pharmacy practice” with ASHP by submitting a case study through the PPMI website at http://www.ashpmedia.org/ppmi/case-studies.html.

The final touches are being made in the planning of AzPA’s Spring Clinical Conference which will be held at Banner Desert Medical Center on Saturday, April 27, 2013. This year’s theme is “Team Health care: Collaboration for Improvement in Patient Outcomes.” We will be offering 6 hours of CE credit, a poster presentation session, law programming and have invited an ASHP Keynote Speaker. Pharmacists, residents, students and technicians are all encouraged to participate. You won’t want to miss this event!

I would love to hear from you regarding how the HSA can help YOU advance YOUR practice in 2013. Without your input our academy can’t meet your needs, goals or expectations. Please email me at ldavis@midwestern.edu or post your thoughts on the AzPA HSA Forum located on the AzPA website.

Lindsay Davis, Pharm.D., BCPS
Health-System Academy Chair
hsa@azpharmacy.org

The Health-System Academy of the Arizona Pharmacy Association is the Arizona affiliate of the American Society of Health-System Pharmacists (ASHP).
Academy News

Technician Academy News

PTCB recently launched a new program for employers. The Employer Partnership Program is designed for national chain, community, and health-system pharmacies that want to encourage pharmacy technicians to participate in the PTCB certification program.

Employers of pharmacy technicians play a critical role in advancing the practice of pharmacy. This responsibility brings both great opportunities and challenges, including hiring the right candidates, training employees, and providing career advancement opportunities. PTCB is committed to helping employers develop a qualified and skilled pharmacy technician workforce that is prepared to support pharmacists and advance patient safety within the evolving health care system.

The Employer Partnership Program offers a variety of complimentary benefits and resources from PTCB. By becoming an Advocate Partner and joining the PTCB Employer Partnership Program, employers receive tools to prepare the workforce and facilitate the professional development of pharmacy technician employees, including free individual verifications of a pharmacy technician’s certification status, monthly newsletters, company recognition on PTCB’s website, and discounts on the Official PTCB Practice Exam™. Please encourage your employer to join the Employer Partnership Program.

Joy Davis, C.Ph.T
Technician Academy Chair
tech@azpharmacy.org

Managed Care Academy News

The Managed Care Academy has been busy already. The fall conference was a joint effort by the Managed Care Academy and the Technician Academy. Thank you to those who attended, presented, participated and made it a success. Congratulations to our Pain Management Consultation winner, Gina Buiocchi from Midwestern University. It was my honor to award the MCA service award to Kyle Linhardt this year. Kyle has been a key player in planning our conferences and we appreciate his time and efforts. Congratulations, Kyle! We are already thinking of ideas for the next conference. The managed care academy also hosted a meet and greet event at the AMCP educational conference in Cincinnati, OH for the first time. Please watch your emails for information about our next meet-and-greet event at the AMCP annual conference and expo in San Diego in April.

We have set up Tour de Cure teams again for both the Phoenix and Tucson rides for March 2013. If you are interested in riding, please consider signing up at www.tour.diabetes.org. Then select club/organization team. We are listed under AZ Pharmacy Association for both rides. Thank you to the pharmacy students that are volunteering to help the American Diabetes Association at their health fair in December and to work the medical tents at the Tour De Cure rides. We now have a representative on the leadership committee of the Tour de Cure and have been working closely with ADA management. They have many ideas for how we can work together across the state. Please reach out to me if you have any questions on how you, your work site, school, academy, or group can get involved. Together we really can make a difference.

Two fun and easy ways to help AzPA are now available. Gift cards can be purchased from the office with no service fee to you and AzPA will receive a portion of the proceeds. Also if you go to our website, you can enter Amazon.com through a panel on the right. You won’t see any difference and again a portion of the amount spent will go directly to AzPA. You must enter Amazon through our website at www.azpharmacy.org for this opportunity to work. Please consider these opportunities to give something to AzPA while you are doing your shopping.

We are always interested in hearing from our AzPA members. If you have ideas, concerns, or topics that you like considered please let us know. Thank you and Happy New Year to you and yours!

Ann Sears, R.Ph.
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Technician Academy News

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Joy Davis, C.Ph.T
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**Student Pharmacist Academy News**

The AzPA Student Pharmacist Academies have had a very productive start to this school year. AzPA is now officially recognized as a student organization at the University of Arizona and Midwestern University – Glendale. This recognition allows for grant opportunities, the ability to fundraise, and a status equivalent to other student pharmacist organizations on each of the campuses. This recognition also serves to foster consistency among the two colleges of pharmacy in Arizona and provides more opportunities for student members to get involved in our profession.

At Midwestern, students celebrated October as Pharmacists Month by promoting the ability of pharmacists and pharmacy interns to immunize. Student volunteers hosted a booth on campus during the lunch hour, educating students from other programs on the importance of immunizations and emphasizing the community’s easy access to pharmacists to receive these immunizations. Student volunteers also educated children on the dangers of prescription drug abuse at Safe Halloween, a trick-or-treating event held on campus. Students promoted the AWARxE campaign by passing out coloring pages and bookmarks and children played a game to see if children could distinguish candy from medicine. Katy the Kangaroo also made a special guest appearance.

The students at Midwestern will also be providing volunteers for the American Diabetes Association’s Health Forum in Mesa and the Phoenix Hot Chocolate Run in December, as well as the American Diabetes Association’s Tour de Cure in March.

The SPA at the University of Arizona has also been participating in several exciting events. The events have given students the opportunity to advocate for their profession and volunteer in the community. Students held a voter awareness and registration drive at the College of Pharmacy where students, faculty, and staff were provided information about how, when, and where to vote. A total of four students registered to vote and twelve people were informed about the general election held in November. The students have also been working hard to increase awareness in the community about drug abuse and misuse, drug counterfeiting, online pharmacies, medication safety, and proper medication disposal through the AWARxE campaign. We partnered with the Arizona Poison and Drug Information Control Center during National Take Back Rx events by incorporating the AWARxE bookmarks with Poison Control pamphlets. A total of 250 people received the pamphlets and were educated about proper medication disposal during the Take Back Rx Events. The AWARxE and Katy’s Kids programs have been presented at Robison Elementary School Health Fair, Palo Verde High School, and Pharmacy Day on the Mall at the University of Arizona.

As you can see, the Student Pharmacist Academy has had a very productive Fall semester and we hope to continue this success into the new year. We have several exciting plans for the Spring semester that will continue to provide students with opportunities to serve the community!

Sophia Galloway, SPA Co-Chair, 
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Eric Wong, SPA Co-Chair,  
University of Arizona College of Pharmacy  
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**Pharmacy Day at the State Capitol 2013**

Please join us for  
“Pharmacy Day at the State Capitol”  
On the Senate Lawn  
Wednesday, January 23, 2013  
11:00 am to 1:00 pm  
Lunch will be provided.

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and the Arizona Pharmacy Association
**DRUG INFORMATION QUESTION**

**Question: What evidence is available on lorcaserin (Belviq®) for weight management?**

*by Irene D. Coon, Pharm.D. Candidate, Class of 2013, and Stacy L. Haber, Pharm.D., Associate Professor, Midwestern University College of Pharmacy-Glendale*

**Answer:**

**Introduction**

The prevalence of overweight and obesity in the U.S. has dramatically increased.\(^1\) Currently, 2 of 3 adults is overweight or obese and it is estimated that 80% of adults will be affected by 2020.\(^2\) The increase in weight is accompanied by an increase in health risks. About 34% of U.S. adults have hypertension, 16% have high cholesterol, and 11% have diabetes, with the majority of cases being type 2 diabetes. Overall, nearly 37% of the population has cardiovascular disease, with poor diet, physical inactivity, overweight, and obesity among the risk factors. Because of the significance of the health consequences of overweight and obesity, efforts to reduce it are of vital importance.

Drug therapy can be a good adjunct to diet and exercise for weight management, but the available options have been limited. Fenfluramine and dexfenfluramine are nonselective serotonin agonists that were withdrawn from the market in 1997 because they were associated with cardiac valvulopathy.\(^3,4\) Phentermine is a sympathomimetic that is only approved for short-term use because of its abuse potential.\(^5\) Orlistat is a lipase inhibitor that can be used for longer durations of time, but is associated with undesirable gastrointestinal side effects.\(^6\)

Recently, the FDA approved 2 new medications for weight loss: phentermine/topiramate (QsymiaTM) and lorcaserin (Belviq®).\(^7,8\) Phentermine/topiramate allows for the use of both agents at lower doses than when used alone.\(^9\) Lorcaserin is a serotonin agonist with potency at the 5-HT\(_2\)C receptor that is 15 times greater than at the 5-HT\(_2\)A receptor and 100 times greater than at the 5-HT\(_2\)B receptor, which may minimize the cardiovascular risks associated with nonselective serotonin agonists.\(^3\) In a search of Medline, 6 randomized controlled trials that evaluated the safety and efficacy of lorcaserin were found: 1 was focused on energy expenditure and intake, 1 evaluated lorcaserin’s abuse potential, and 4 were focused on weight loss as the primary endpoint, which are summarized below.\(^3,10-12\)

**Clinical Trials**

In 2009, a randomized, double-blind, placebo-controlled study by Smith et al. conducted over 3 months was published.\(^3\) Four hundred and sixty-nine patients aged 18 to 65 years with a body mass index (BMI) of 30 to 45 kg/m\(^2\) were randomized to receive lorcaserin 10 mg daily, 15 mg daily, 10 mg twice daily, or placebo. Patients were instructed not to change their dietary and exercise habits. The primary endpoint was the change in weight from baseline to day 85. The secondary endpoints included change from baseline in BMI, waist and hip circumference, cholesterol, high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, and triglycerides. The change in weight was -1.8, -2.6, and -3.6 kg in the 10 mg daily, 15 mg daily, and 10 mg twice daily groups, respectively, compared to -0.3 kg in the placebo group (p<0.001 for each comparison). For the secondary endpoints, the change in BMI was -0.7, -1.0, and -1.3 kg/m\(^2\) in the 10 mg daily, 15 mg daily, and 10 mg twice daily groups, respectively, compared to -0.1 kg/m\(^2\) in the placebo group (p<0.001 for each comparison). The reduction in waist circumference was only significant in the 15 mg once daily (-3.7 cm, p=0.017) and 10 mg twice daily groups (-4.4 cm, p=0.01) compared to placebo (-2.1 cm). The reduction in hip circumference was only significant in the 10 mg twice daily group (-2.9 cm) compared to placebo (-1.3 cm, p<0.05). Change in cholesterol was significant in the 15 mg once daily (-0.772 mg/dL, p<0.05) and 10 mg twice daily groups (-6.95 mg/dL, p<0.05) compared to placebo (+1.54 mg/dL). There were decreases in HDL cholesterol in the 15 mg once daily and 10 mg twice daily groups (-3.86 mg/dL for both groups) compared to no reduction in the placebo group (p<0.05 for each comparison). There were non-significant reductions in LDL cholesterol and triglycerides in all groups. The most common adverse events were headache (29.6% in all lorcaserin groups vs. 17.8% in the placebo group), nausea (9.7% vs. 3.4%), and dizziness (7.1% vs. 0%). This study concluded that lorcaserin was safe and effective for weight loss when used for 12 weeks.

In 2010, Smith et al. published a 2-year, randomized, double-blinded, placebo-controlled trial.\(^10\) Patients aged 18 to 65 years with a BMI of 30 to 45 kg/m\(^2\) or 27 to 45 kg/m\(^2\) and at least 1 coexisting condition, such as hypertension, dyslipidemia, cardiovascular disease, impaired glucose tolerance, or sleep apnea, were enrolled. Unlike the previous study, this trial instructed all patients to exercise moderately (30 minutes daily) and reduce calorie intake (600 kcal below the individual estimate for daily energy requirements). There were 1538 patients randomized to receive lorcaserin 10 mg twice daily and 1499 randomized to receive placebo. The primary endpoints for year 1 were the proportion of patients with a reduction in baseline body weight of ≥5%, the change in weight from baseline, and the proportion of patients with a reduction in baseline body weight of ≥10%. The secondary endpoints were changes from baseline in values of lipids, glycemic variables, physical measures, and inflammatory markers of cardiovascular risk. The percentage of patients who lost ≥5% of their weight was 47.5% in the lorcaserin group compared to 20.3% in the placebo group (p<0.001). The average weight loss was -5.8 kg in the lorcaserin group compared to -2.2 kg in the placebo group (p<0.001). The percentage of patients who lost ≥10% of their weight was 22.6% in the lorcaserin group compared to 7.7% in the placebo group (p<0.001). For the secondary endpoints, there was a change in total cholesterol of -0.888 mg/dL in the lorcaserin group compared to +0.579 mg/dL in the placebo group (p=0.001). There was a change in fasting glucose of -0.8 mg/dL in the lorcaserin group compared to +1.1 mg/dL in the placebo group (p<0.001). In the homeostasis model assessment of insulin resistance, there was a change of -0.41 in the lorcaserin group compared to -0.17 in the placebo group (p<0.001). There was a change in systolic blood pressure of -1.4 mmHg in the lorcaserin
group compared to -0.8 mmHg in the placebo group (p = 0.04) and in diastolic blood pressure of -1.1 mmHg in the lorcaserin group compared to -0.6 mmHg in the placebo group (p = 0.01). High sensitivity C-reactive protein decreased in the lorcaserin group by -1.19 mg/L compared to -0.17 mg/L in the placebo group (p < 0.001). For year 2, patients who remained in the lorcaserin group at the end of year 1 were randomly reassigned in a 2:1 ratio to either continue lorcaserin 10 mg twice daily or begin placebo, while those in the placebo group continued to receive placebo. The primary endpoint was the proportion of patients who had a reduction in baseline body weight of ≥ 5% at the end of year 1 and maintained this reduction at the end of year 2. Of patients who continued to receive lorcaserin, 67.9% maintained their weight loss compared to 50.3% of patients who were reassigned to placebo (p < 0.001). During years 1 and 2, the adverse events that were more common in patients receiving lorcaserin than placebo were headache (7.2% vs. 4.3%) and nasopharyngitis (16.4% vs. 12.6%). This study concluded that lorcaserin was associated with significant weight loss and improved weight maintenance when used with behavior modification.

Fidler et al. conducted a randomized, double-blinded, placebo-controlled trial of 2 doses of lorcaserin for weight loss with the same behavioral modification used in the previous study. The patients were aged 18 to 65 years, with a BMI of 30 to 45 kg/m² or 27 to 29.9 kg/m² in the presence of hypertension, dyslipidemia, cardiovascular disease, impaired glucose tolerance, or sleep apnea. There were 4008 patients randomized in a 2:1:2 ratio to receive lorcaserin 10 mg twice daily, 10 mg daily, or placebo. The primary endpoints were the same as those used by Smith et al. and Fidler et al. The impact of lorcaserin on glycemic control was one of the secondary endpoints. The results revealed that 37.5% of patients in the lorcaserin 10 mg twice daily group, 44.7% in the 10 mg once daily group, and 16.1% in the placebo group lost ≥ 5% of their baseline body weight (p < 0.001 for each comparison vs. placebo). The change in weight was -4.7 kg in the lorcaserin 10 mg twice daily group, -5.0 kg in the 10 mg once daily group, and -1.6 kg in the placebo group (p < 0.001 for each comparison vs. placebo). Weight loss of ≥ 10% of baseline body weight was achieved by 16.3% of patients in the lorcaserin 10 mg twice daily group, 18.1% in the 10 mg once daily group, and 4.4% in the placebo group (p < 0.001 for each comparison vs. placebo). Change from baseline in HbA1c was -0.9% in the lorcaserin 10 mg twice daily group, -1.0% in the 10 mg once daily group, and -0.4% in the placebo group (p < 0.001 for each comparison vs. placebo). Symptomatic hypoglycemia occurred in 7.4%, 10.5%, and 6.3% of patients taking lorcaserin 10 mg twice daily, 10 mg once daily, and placebo, respectively. In this study, lorcaserin was associated with significant weight loss and improved glycemic control in patients with type 2 diabetes.

Discussion

These studies provide data to support the efficacy and safety of lorcaserin; however, some limitations were noted. Due to the valvulopathy with serotoninergic agents, cardiovascular effects were evaluated in all studies. None found an increased risk with lorcaserin, but they were not powered to evaluate safety, so a definitive conclusion cannot be made. Drop-out rates were high in all studies, which may have affected the results. Additionally, in the study by O’Neil et al., more patients dropped out of the 10 mg twice daily group than the 10 mg once daily group (34% vs. 22%), which may have contributed to the lower weight loss (-4.7 kg vs. -5.0 kg), an unusual finding since the effects were consistently dose-related in other studies. Lastly, O’Neil et al. specifically evaluated patients with type 2 diabetes; however, only those taking oral medications such as metformin, a sulfonylurea, or both were included, so the results may be different in patients with more advanced disease who require insulin.

The efficacy and safety of lorcaserin has not been evaluated against or in combination with other weight loss agents approved for long-term use, but some comparisons can be made. All agents have been associated with improvements in lipids, blood pressure, and glycemic control. None of the agents are available as generics. Lorcaserin is prescription-only and approved as 10 mg twice daily; in clinical trials, the average weight loss was 6.4 to 7.9 pounds and the most common adverse effects were upper respiratory tract infections, headache, and nausea. Orlistat is available in over-the-counter and prescription strengths and administered 3 times daily; the average weight loss is 6.6 to 8.8 pounds and the most common adverse effects are upper respiratory tract infections, headache, and gastrointestinal effects (e.g., oily spotting, abdominal, and
flatulence). Phentermine/topiramate is prescription-only and administered once daily; in clinical trials, the average weight loss was 22.4 to 23.0 pounds and the most common adverse effects were parasthesia, constipation, and insomnia. Additionally, because of a teratogenic risk, phentermine/topiramate is only available under the Risk Evaluation and Mitigation Strategy program at certified pharmacies.

Based on this information, phentermine/topiramate may be associated with the greatest weight loss, and orlistat and lorcaserin are associated with similar, smaller amounts. Each agent has different adverse events, and because lorcaserin and phentermine/topiramate are new, additional safety data from postmarketing surveillance are needed. In conclusion, there is positive evidence from 4 clinical trials on the use of lorcaserin for weight management and it is a reasonable option for most patients.

References:
A Quality Guy
by Katherine Murphy, Pharm.D. Candidate, Midwestern University College of Pharmacy - Glendale, Class of 2013.

Neil MacKinnon, B.Sc., M.S., Ph.D., FCSHP, is a Professor and the Walter H. Pearce Endowed Chair for the College of Pharmacy; Director of the Center for Rural Health for the Mel and Enid Zuckerman College of Public Health at the University of Arizona.

Dr. MacKinnon received his Bachelor of Science in Pharmacy and Master of Science in Hospital Pharmacy from Dalhousie University, Halifax, Nova Scotia. He received his Doctor of Philosophy in Pharmacy Health Care Administration from the University of Florida, Gainesville. He participated in an ASHP accredited Specialized Residency in Hospital Pharmacy from the University of Wisconsin Hospital, Research Fellow, DuBow Family Center for Research in Pharmaceutical Care, and a Harkness Associate in International Health Policy & Practice, the Commonwealth Fund and the Canadian Health Services Research Foundation.

Dr. MacKinnon recently relocated to Arizona from Nova Scotia, Canada.

Would you describe your current role at the University of Arizona?
I am currently the Director at the Center for Rural Health, which houses the state office of rural health for Arizona. It’s a unique position because I really have two roles, as a professor of public health and as the director of the center. All 50 states have a state office of rural health, but Arizona is different since it is not housed at the state capitol but rather at a university. I’m also the only pharmacist in this role throughout the country, which I think is important in showing the utility that pharmacists can provide. My cousin, Dr. George MacKinnon, the dean of a Chicago pharmacy school, has said “pharmacists are the engineers of health care,” referring to the broad skill set that mark pharmacists. I think this role is a perfect example of that.

You were born in Nova Scotia and studied at several universities across the USA, so what made you choose to come to Arizona?
My wife, actually, in two simple words. She is originally from the Glendale area, but we met in graduate school at the University of Florida. We have many family members throughout the state of Florida. We were interested in coming back to Arizona, and the position at the University was the right opportunity, at the right time, and in the right place.

Neil MacKinnon, B.Sc., M.S., Ph.D., FCSHP

Recently, you were among the presenters of a CE program on Pharmacy Quality Assurance (PQA) at the 2012 Community Pharmacy Academy Conference, could you give us an overview of the current state of PQA in Arizona?
In recent years, we have seen an increase in the awareness of the importance of patient safety and the realization that health care is not very safe, especially compared to other industries. With that realization has come a call for increased accountability. Hospitals and health systems have dealt with this through regulating bodies such as JCAHO. However, community pharmacy has become a new target for improving patient safety. Arizona has passed statutes mandating all community pharmacies to employ a quality assurance program, and the rules and regulations (enforced by the Board of Pharmacy) are expected to go into effect in January 2013. It’s important to note that a quality assurance program at its core is a system designed to identify errors and create solutions for preventing those errors. Staff communication and documentation are an important part for ensuring a successful quality assurance program.

One of the largest obstacles for any quality assurance program is often the fear of blame and disciplinary action for an error. How do you change that perception to encourage error reporting?
Nobody likes to make a mistake, and talking about those mistakes is a sensitive subject. I think that is a natural human reaction. But at the same time, we know there is so much value in sharing errors so that others can learn from those mistakes. Unfortunately, you just need to show that blame is not the point, and eventually, that culture of error reporting will come.

You’ve been involved in creating many quality assurance programs both in the USA and in Canada. What have you seen work the best for creating a valuable system?
Pharmacy technicians offer huge value throughout this process. Because of the hierarchal nature between a pharmacist and a pharmacy technician, sometimes a pharmacy technician is afraid to report errors or question a prescription. But pharmacy technicians often see another aspect and another side that pharmacists don’t. Their input is extremely valuable, and it is important to make sure they are part of the quality assurance process.

How can pharmacy students be prepared to engage in quality assurance upon graduation?
All pharmacists, regardless of their practice setting will need to be able to operate and understand the quality assurance process. Hopefully, the curriculum in pharmacy school has exposed students to the theory and resources to be successful in the area of quality assurance. If students are able, I would highly suggest participating in elective rotations in the area of quality assurance or medication safety, or even just participating in the quality assurance program on any rotation. The Institute for Safe Medication Practices (ISMP) is also a great resource for tips and newsletters on medication safety.
What is your favorite part of your current position at the University of Arizona?
In some ways, I feel as though most of my professional career has been within a “pharmacy bubble.” I worked mainly with pharmacists and pharmacy students. Now I work in a public health setting, where I work primarily with non-pharmacists. It’s been eye opening to see how little other health care professionals and lay people know about what pharmacists can do. I’ve really enjoyed spreading the word about the value pharmacists can provide.

Did you have a mentor in your career? If so, what was the best advice they ever gave you?
I have had several mentors throughout my life, which I think is common. Depending on your goals and focus at different points in time, you gravitate to different individuals you admire. One of my mentors, David Zilz, former director of the University of Wisconsin Hospital and Clinics and a past president of ASHP, described the idea of a “triple helix.” He was referring to the concept of work-life balance, with three components: occupation, family time, and relaxation time. And just like a triple helix, if one piece is out of whack, the entire thing falls apart. I know that balance can be hard for everyone to achieve, but thinking about it in that way has helped me focus on keeping that balance.

You are currently a member of many pharmacy associations both nationally and internationally. Why is being a member of the Arizona Pharmacy Association important to you?
As a pharmacist, it is critical to support not only state, but also national associations. They really are the voice of our profession, and can have much more influence than one person because they represent so many pharmacists, students, and technicians. I think we all can be selfish and find excuses for not supporting these organizations. It requires too much time, or it costs too much. But it doesn’t have to be an inordinate amount of time or money to make a difference in the profession of pharmacy. If you spend your whole career not being part of these organizations, you’ve missed the opportunity to influence legislation, health care decision makers, and even your patients.

If you could give pharmacy students any advice as they begin their careers, what would it be?
Make sure you ask at interviews how each employer is going to ensure that you will be able to use your skills that you learned in pharmacy school. Ask for a breakdown of responsibilities for your position and see if that aligns with what you’re looking for in a job. I’d also suggest writing down your most desired qualities in a workplace and give that to employers before the interview. That way, they will have an idea of what your needs are, and they can show you how they can facilitate achieving them. Employee development and retention are key pieces for employers, and the more they know about what you need from them, the better experience you will have.

In Memoriam

Preston Earl Palmer, 84, peacefully passed away at his home on Friday, December 7, 2012. Earl was a native of Mesa, AZ. He was born on February 17, 1928 to Preston Wesley and Pearl (Millett) Palmer. He is survived by his children Carroll Jean Bushman, Melvin Earl, Cynthia Black, Rodney Lynn, his brother Melvin and sister Peggy Richardson. He was preceded in death by his loving wife, Nell Carroll (Shumway) Palmer (1995), his mother and father, and sister Jenet Pearl Palmer. Earl and Nell were married for time and all eternity in the Mesa temple on February 20, 1953. He was a member of the first graduating class of the College of Pharmacy at the University of Arizona. He worked as a Pharmacist for Mesa General Hospital, Smitty’s/Fry’s Market Place and other pharmacies in the valley until he retired at 76. Earl was a lifelong member of The Church of Jesus Christ of Latter-day Saints. His family and his testimony of the Lord were his greatest treasures. Services were held on December 13, 2012 at the Mesa Arizona Maricopa North Stake Center of the Church of Jesus Christ of Latter-day Saints and burial was at the City of Mesa Cemetery.

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Anti-platelet Therapy in Acute Coronary Syndromes: Updates in Therapy after Stent Implantation

by Ryan McKenzie, Pharm.D. Candidate Class of 2013; Andrew Park, Pharm.D. Candidate Class of 2013; Laura Tsu, Pharm.D., BCPS; Midwestern University College of Pharmacy - Glendale

Goal:
This home-study CPE activity has been developed to educate pharmacists on updates in anti-platelet therapy after stent implantation.

Objectives:
At the conclusion of this lesson, successful participants should be able to:
1. Identify the mechanism of action and unique characteristics of the FDA-approved P2Y₁₂ receptor antagonists used in secondary prevention of cardiovascular disease.
2. Describe the recent recommendations regarding safety and efficacy for oral anti-platelet therapy post cardiac-stent placement.
3. Compare the benefits and risks associated with each P2Y₁₂ receptor antagonists based on presented clinical data.
4. Select the appropriate anti-platelet therapy using patient-specific parameters for prevention of recurrent cardiac events.

Introduction
Despite advances in pharmacotherapy and technology, acute coronary syndromes (ACS) remains a significant health care issue with more than 1.2 million Americans suffering an ACS event annually.¹ The usual culprit in ACS is an atheromatous plaque rupture which causes platelet activation and aggregation, leading to the propagation of the coagulation cascade. If untreated, the formation of a platelet-rich “white” clot will lead to an ACS event, which includes ST segment elevation myocardial infarction (STEMI), non-ST segment elevation myocardial infarction (NSTEMI) or unstable angina (UA). Treatment options for ACS include percutaneous coronary interventions (PCI) with stent implantation, thrombolytic therapy, and/or medical management.

After the acute treatment of patients with ACS, the pharmacotherapy focus shifts to secondary prevention of cardiovascular events. In patients who receive a stent implantation, one of the most important preventative measures is anti-platelet therapy to prevent both stent restenosis and in-stent thrombosis. Anti-platelet therapy for secondary prevention of cardiac events in the first year after ACS with PCI therapy and stent placement centers on several options: clopidogrel, prasugrel, ticagrelor, and aspirin. The first 3 agents are P2Y₁₂ receptor antagonists while aspirin inhibits platelet cyclooxygenase-1. Regardless of the mechanism, inhibition of these platelet pathways ultimately results in decreased platelet activation and aggregation. For patients with implanted coronary stents, there are differing lengths of anti-platelet therapy based on the type of stent placed.²³ The recommended therapy for bare metal stent placement include dual anti-platelet therapy with aspirin 75 - 325 mg daily and clopidogrel 75 mg for 1 month, then low dose aspirin 81 mg daily and clopidogrel 75 mg daily for the subsequent 11 months, and then single anti-platelet therapy with aspirin 81 mg daily indefinitely thereafter. The recommended therapy for drug-eluting stent placement include dual anti-platelet therapy with aspirin 75 - 325 mg with clopidogrel 75 mg daily for 3 - 6 months (minimum of 3 months for sirolimus-eluting stent and 6 months for paclitaxel-eluting stent), then low dose aspirin with clopidogrel 75 mg daily for 6 - 9 months thereafter, and then single anti-platelet therapy with aspirin 81 mg daily indefinitely thereafter (see Figure 1. for algorithm).⁴ The 2011 American College of Cardiology Foundation/American Heart Association Task force on Practice Guidelines and the Society for Cardiovascular Angiography and Interventions (ACCF/AHA/SCAI) recommend indefinite aspirin 81 mg therapy in preference over higher doses in combination with P2Y₁₂ receptor antagonists. A minimum of 12 months of therapy with P2Y₁₂ receptor antagonists is recommended with either a bare metal stent or drug-eluting stent if the patient is not at high risk of bleeding. Continuation of therapy beyond 12 months may be considered for those with drug-eluting stent placement and low risk of bleeding (see Figure 2. for algorithm).⁵

Both the CHEST and 2011 ACCF/AHA/SCAI practice guidelines recommend the use of aspirin therapy with a P2Y₁₂ receptor antagonist post-cardiac stent implantation. In contrast, the guidelines differ with regard to the preference given to the individual P2Y₁₂ receptor antagonist. The recent CHEST guidelines give preference to ticagrelor therapy over clopidogrel and prasugrel.²⁴ Therefore, the focus of this review is to compare the similarities and differences in efficacy and safety between the 3 FDA-approved P2Y₁₂ receptor antagonist: clopidogrel, prasugrel, and ticagrelor.

Clopidogrel (Plavix®)
Clopidogrel is a second-generation thienopyridine which irreversibly inhibits the P2Y₁₂ receptor on platelets. It is a pro-drug that requires hepatic biotransformation via CYP enzymes, particularly CYP2C19, to produce the active metabolite necessary to exert its pharmacological actions.⁵ The active metabolite formed in this process targets the P2Y₁₂ receptor, one of the adenosine diphosphate (ADP) receptors on the platelet surface, to prevent platelet recruitment and activation of the GPIIb/IIIa receptor complex; in so doing, platelet aggregation is reduced.⁶ Clopidogrel's pharmacokinetic profile exhibits rapid dose absorption with or without food.⁷ The conversion of the parent drug to active metabolite with maintenance dosing at 75 mg daily takes, on average, about two days to see inhibition of platelet aggregation (IPA) with peak effect occurring in 5 - 7 days.⁸ Due to the potential need for rapid inhibition of platelet aggregation, loading doses have been used to achieve faster therapeutic goals as studies have shown that peak IPA was able to be achieved within 6 hours with higher loading doses (300 mg, 600 mg, 900 mg).⁹

Although approximately half of the systemically circulating clopidogrel is cleared through the kidneys and the other half in the feces, there is limited data on the safety of this medication in renal impairment. No adjustment is necessary for those with hepatic impairment. It is also important to consider that while the half-life of clopidogrel is relatively
Continuing Education (continued from page 33)

short (~ 0.5 hour) compared to the parent compound (~ 6 hours), it binds irreversibly to the platelet receptors resulting in normal platelet function of those blocked by clopidogrel to return with the development of new platelets. Platelet turnover takes approximately 7-10 days which is how long it would take for normal platelet function to return after the last dose of clopidogrel is administered.6,7

Efficacy of clopidogrel in PCI

For patients with newly placed coronary stents, dual anti-platelet therapy with clopidogrel in addition to aspirin has shown to improve outcomes with long-term therapy. Data from studies such as the PCI-CURE trial which found significantly lower rates of cardiovascular (CV) death, myocardial infarction (MI), or any revascularization in patients undergone PCI with dual anti-platelet therapy beyond 4 weeks of treatment have helped to focus subsequent studies on the optimal length of therapy.10 The CREDO trial did just that and provided optimization for long-term anti-platelet therapy post-PCI when they found that there was relative reduction (26.9%) on the optimal length of therapy. Data from studies such as the PCI-CURE trial which found significantly lower rates of cardiovascular (CV) death, myocardial infarction (MI), or any revascularization in patients undergone PCI with dual anti-platelet therapy beyond 4 weeks of treatment have helped to focus subsequent studies on the optimal length of therapy.10 The CREDO trial did just that and provided optimization for long-term anti-platelet therapy post-PCI when they found that there was relative reduction (26.9%) in combined CV events with at least a year of long-term dual therapy with clopidogrel and aspirin.11 These trials highlight the significant use of clopidogrel in this patient population; however, the following sections will address several considerations that should be made when choosing this agent.

Drug Interactions with Proton Pump Inhibitors

In an effort to maintain high therapeutic efficacy but minimize gastrointestinal (GI) toxicity from clopidogrel use, clinicians began adding on proton-pump inhibitor (PPI) treatment. While effective, in vitro data supported the notion that competitive inhibition by PPIs of CYP2C19 may alter the necessary metabolic step needed to produce the active metabolite of clopidogrel.11 The focus of current discussion is the therapeutic effect this interaction has on therapy outcomes. In the prospective randomized placebo-controlled COGENT trial of 3,873 patients, investigators assigned patients on dual anti-platelet therapy (clopidogrel 75 mg and aspirin 75 mg - 325 mg daily) to either omeprazole 20 mg or placebo. The primary endpoint of composite gastrointestinal event as determined by bleeding ulcers, obstruction, or perforation addressed the potential benefits of gastrointestinal protection while on anti-platelet therapy. In addition, the primary safety endpoint composite of CV events as determined by death from CV causes, MI, revascularization, or stroke addressed the proposed interaction between clopidogrel and omeprazole on decreased anti-platelet activity. The study found lower gastrointestinal events rates with omeprazole when compared to placebo; supportively, in the safety endpoint comparison, there was no difference in the risk of CV events or MI in the treatment groups.13

In order to evaluate the effects of this interaction even further, a meta-analysis of twenty five studies (159,138 patients) was performed to assess the association of adverse events with combination therapy. They found that combination therapy with PPIs (searched keywords of ‘pantoprazole,’ or ‘omeprazole’ or ‘esomeprazole’ or ‘lansoprazole’ or ‘rabeprazole’) with clopidogrel was associated with increased risks of major adverse CV events and MI at 29% and 31%, respectively. However, PPI use was not associated with an overall increase in mortality. Subgroup analyses of concomitant use of clopidogrel with either pantoprazole or omeprazole were not associated with an increased risk of major CV events. While the analysis showed no influence on mortality, the investigators did find a decrease in the risk of developing GI bleed under PPI treatment by 50%.12

In lieu of the results presented in these trials, the Food and Drug Administration continues to warn against concomitant use of clopidogrel and PPIs, and recommends that combination treatment be used with caution. It should be noted that this warning advisory does not apply to all PPIs as not all PPIs affect the CYP enzymes similarly.14 The ACCF/ACG/AHA released a 2010 update on the 2008 Expert Consensus Document on Reducing the Gastrointestinal Risks of Antiplatelet Therapy and NSAID Use stating that a small to moderate association can be made based on available evidence; however, further randomized controlled trials are needed to validate the associations found in observational studies. While several trials showed no significant association of CV events, the potential relative risk of CV events may warrant caution in combination therapy. The lack of consensus among trials confounds a clear association of PPI use with clopidogrel as the data is weak to establish decreased anti-platelet activity with coadministration. Ultimately, treatment decisions need to assess whether the potential benefits outweighs potential harm as patients with prior upper GI bleeding and risk factors may benefit from prophylaxis against GI bleeding.15

Decreased platelet responsiveness

In regards to anti-platelet efficacy, clopidogrel has a black box warning notifying that patients with genetic variability in CYP2C19 function, such as those with two nonfunctional alleles termed “poor metabolizers” of clopidogrel, may have reduced anti-platelet activity. Studies have suggested that high on-treatment platelet reactivity, those that require higher doses to achieve therapeutic effect, occurs in one-third of those prescribed clopidogrel.4 As a result, there have been higher cardiovascular event rates when this patient population is exposed to normal recommended doses when compared to those that do not have the decreased CYP2C19 function. A meta-analysis compared the risk of major adverse cardiovascular events of clopidogrel administration between noncarriers (71.5%), heterozygotes (26.3%), or homozygotes (2.2%) of reduced-function CYP2C19 alleles that underwent PCI that had an ACS. This study found that there was a significantly increased risk in both the patient populations with 1 reduced-function CYP2C19 allele and 2 reduced-function CYP2C19 alleles when compared to noncarriers. The analysis also found a significantly increased risk of stent thrombosis in both carriers of the reduced-function allele suggesting those patient populations with even 1 reduced-function CYP2C19 allele may not be fully protected from cardiovascular events despite standard doses of clopidogrel.16 Considering this patient population, there currently lacks support for the use genetic testing or platelet function testing to individualize anti-platelet therapy.3

Dosing and monitoring of clopidogrel

Clopidogrel is recommended to be administered as a 600 mg loading dose during PCI, followed by 75 mg daily maintenance dose.2 In addition to the
aforementioned precautions regarding PPIs, health care providers should be aware of other medications that are CYP2C19 inhibitors. Examples include fluconazole, voriconazole, and fluoxetine.

As with other medications in the thienopyridine class, there are risks of bleeding present with clopidogrel. Careful consideration in certain patient populations should be made as clopidogrel is contraindicated in those with active bleeding such as peptic ulcer or intracranial hemorrhage. Bleeding concerns have also prompted the recommendation to discontinue clopidogrel 5 days prior to surgery. When clopidogrel was stopped beyond 5 days before a coronary artery bypass graft (CABG), rates of major bleeding were similar to those taking placebo. In comparison, patients who remained on clopidogrel within 5 days of a CABG, rates of major bleeding were higher at 9.3% compared to 6.3% in the placebo group (see Table 1 for comparison chart).17

Newer anticoagulants options: prasugrel and ticagrelor

Clopidogrel has been clinically proven to reduce recurrent cardiovascular events but clopidogrel has several limitations: it is a pro-drug that requires hepatic conversion, has a delayed onset, and demonstrates a wide inter-patient variability and delayed recovery due to irreversible receptor binding. Prasugrel and ticagrelor, two relatively new P2Y12 receptor antagonists have been approved as alternatives to clopidogrel for patients with ACS undergoing PCI with stent placement.2,4 Both seek to address some of the issues faced with clopidogrel.

Prasugrel (Effient®)

Prasugrel was approved in 2009 for the reduction of recurrent cardiovascular events in patients with ACS who are undergoing PCI. Similar to clopidogrel, prasugrel is a thienopyridine which irreversibly inhibits the P2Y12 receptor on the platelet.19 Prasugrel seeks to improve upon the shortcomings of clopidogrel with some key differences. While it is also a pro-drug, prasugrel is metabolized in the gastrointestinal tract and liver more rapidly than clopidogrel and the resulting metabolite binds irreversibly to the P2Y12 receptors on platelets inhibiting their aggregation without the need for a second activation step compared to two for clopidogrel. Also, prasugrel is not as adversely affected by individual genetic variations, which results in faster and more predictable platelet inhibition.5 It can reach peak concentration in as quickly as 30 minutes and last up to 7 hours.19

Efficacy and safety of prasugrel

The TRITON-TIMI 38 phase 3 study sought to determine the safety and efficacy of prasugrel compared to clopidogrel in 13,608 patients with ACS who were undergoing PCI. Clopidogrel was administered as a 300 mg loading dose then 75 mg daily while the comparator group was administered prasugrel 60 mg loading dose then 10 mg daily for 6 to 15 months. The study measured the primary efficacy endpoints of death from CV causes, nonfatal MI, and nonfatal stroke, while the incidence of major bleeding was the major safety endpoint. It was observed that in addition to a significantly lower number of primary efficacy endpoint events with prasugrel (9.9%) as compared with clopidogrel (12.1%), the prasugrel group also had fewer rates of MI, target-vessel revascularization, and stent thrombosis. However, the added benefit of increased efficacy came with the drawback of a higher incidence of major and life-threatening bleeding events in the prasugrel group.20

Due to this increased risk of bleeding in the total study population, further subgroup analyses were performed to determine whether or not certain patient populations would experience a greater net clinical benefit from prasugrel, with the reduction in cardiovascular events outweighing the bleeding risk. To answer these questions, 2 separate subgroup analyses were performed on patients with diabetes and with a STEMI. Of the total 13,608 patients in the TRITON-TIMI 38 trial, the first subgroup analysis trial explored the safety and efficacy of prasugrel versus clopidogrel in the 3,146 patients with diabetes mellitus (DM). From a primary efficacy standpoint, there were significantly fewer incidents of (CV death, non-fatal MI, or non-fatal stroke) with prasugrel compared to clopidogrel in both the diabetic (9.2% versus 10.6%) and non-diabetic (12.2% versus 17%) groups. In contrast to the findings in the original TRITON-TIMI 38 trial, the diabetic subgroup in this study did not have an increased risk of major bleeding compared to clopidogrel (2.6% versus 2.5%). For patients on prasugrel, the greater relative reduction in incidents of the primary endpoint and MI events without an observed increase in major bleeding provided a greater net clinical benefit when compared to clopidogrel.21

The other subgroup analysis included 3,534 participants with STEMI treated with either prasugrel or clopidogrel. The primary endpoint was a composite of CV death, non-fatal MI, or non-fatal stroke at 30 days and at 15 months. Compared to clopidogrel, the prasugrel group had a significantly lower incidence of the primary efficacy endpoint at both 30 days (9.5% vs. 6.5%) and at 15 months (12.4% vs. 10%). There was no significant difference in major bleeding unrelated to CABG surgery between both groups; similarly, no difference was reported in life-threatening bleeding, intracranial hemorrhage, or minor bleeding at 15 months. However, it was observed that patients on prasugrel who underwent CABG surgery experienced an increased risk for major bleeding compared to those on clopidogrel.22 Therefore, STEMI patients may also be a population in which prasugrel demonstrates a greater net clinical benefit when compared to clopidogrel.

Although prasugrel showed additional benefits for diabetics and those who have STEMIs, it is important to note that neither of these subgroup analyses were designed or powered for all clinical endpoints in the population, and the small sample size may have skewed the results.21, 22

Dosing and monitoring of prasugrel

In patients undergoing PCI with stent placement, prasugrel is typically administered as a single 60 mg loading dose followed by a maintenance dose of 10 mg once daily if the patient weighs more than 60 kg. Patients with lower body weights may have an increased risk of bleeding and it is recommended that a lower 5 mg maintenance dose be used for those weighing less than 60 kg.2,23 It must be noted, however, that although a lower maintenance dose is recommended for lower weight patients, safety and efficacy at this dose has not yet been studied.

Most of the contraindications and warnings center on patients with these risks due to the increased incidence of major and potentially fatal bleeding seen in the prasugrel trials when compared
to clopidogrel. It is contraindicated in patients with active pathological bleeding, history of transient ischemic attack (TIA) or stroke. Other high risk populations with an increased risk of bleeding include patients older than 75 years, weigh less than 60 kg, have a propensity to bleed, and are using concomitant medications that increase bleeding risk. Examples of these medications include warfarin, NSAIDS or fibrinolytic therapy. While it is generally not recommended to use prasugrel in patients older than 75 years, it may be considered in patients with diabetes or STEMI, as those groups demonstrated a greater net clinical benefit compared to the total study population.21

Prasugrel should be stopped at least 7 days before CABG with the extra time required due to the longer half-life.22 If possible, it is recommended that any bleeding be managed without discontinuing the medication due to increased risk of cardiovascular events if stopped prematurely. Practitioners managing these patients should also consider other common adverse drug events, including hypertension, hyperlipidemia, head and backaches, dyspnea, nausea and vomiting. Concomitant use of medications that increase bleeding risk should be avoided if possible, but interactions with CYP inducers or inhibitors were not significant. Fortunately, there is no renal dosing and the lower CYP activation means that no dose adjustment is needed in patients with mild to moderate hepatic impairment (see Table 1 for comparison chart).23

Ticagrelor (Brilinta®)

Ticagrelor is classified as a cyclopentyltriazolopyrimidine. It binds reversibly to the P2Y₁₂ receptor at an allosteric site, changes the receptor conformation, and prevents ADP-stimulated activation of the glycoprotein IIb/IIIa receptor and attenuating platelet aggregation.3 Unlike clopidogrel and prasugrel, ticagrelor is not a pro-drug and does not require metabolism to an active form. It is also broken down into at least one active metabolite with a similar potency to the parent drug. This combination of properties produces a rapid onset of action within 30 minutes, and a peak inhibitory effect in 2 hours.3

Efficacy and safety of ticagrelor

The landmark phase 3 PLATO trial compared the safety and efficacy of ticagrelor with clopidogrel for prevention of cardiovascular events in patients with ACS.26 Ticagrelor was given as a 180 mg loading dose then 90 mg twice daily and clopidogrel was given as a 300 – 600 mg loading dose then 75 mg daily. This study followed 18,624 patients over 12 months to determine the outcomes for a primary efficacy end point designated as time to the first occurrence of a composite of death from vascular causes, MI or stroke and primary safety endpoints of first occurrence of major bleeding.26 It was observed that ticagrelor (9.8%) showed greater efficacy in preventing the primary efficacy end points than clopidogrel (11.7%) and the incidents of major bleeding were similar between the two groups (ticagrelor 11.6% vs. clopidogrel 11.2%). Unfortunately, patients on ticagrelor did experience a higher rate of non–CABG-related major bleeding, intracranial bleeding and dyspnea.26

The PLATO trial discovered an anomaly in which ticagrelor was significantly less effective in North American patients compared to the rest of the world. The North American sub-study sought to determine the possible causes of this difference, and identified an underlying statistical interaction with aspirin maintenance dose. Of the 37 factors explored, only the maintenance aspirin dose emerged as a possible explanation for the regional differences.23 Analysis revealed that more patients in the United States (53.6%) took a higher maintenance dose of aspirin > 300 mg than the rest of world (1.7%) and that low-dose maintenance aspirin concomitantly with ticagrelor had better outcomes compared to clopidogrel. The authors of the study theorized that aspirin’s dose dependent inhibition of endothelial prostacyclin may reduce the anti-platelet effect of ticagrelor at higher doses. However, they do acknowledge that further research is needed to elucidate the possible mechanism of this interaction and that chance cannot be ruled out given the current data.23 Based on the current available data, it is recommended that ticagrelor should only be administered with low-dose maintenance aspirin.23

Dosing and monitoring of ticagrelor

Patients being started on ticagrelor should be given an initial loading dose of 180 mg at the time of PCI, and then continued on a maintenance dose of 90 mg twice daily.24 Ticagrelor is primarily metabolized by hepatic CYP3A4 enzymes so it is susceptible to drug interactions with medications that inhibit or induce these enzymes. Concomitant use of inducers such as rifampin or phenytoin and inhibitors such as azoles, clarithromycin or protease inhibitors should be avoided. Ticagrelor can reduce the metabolism of other drugs which are CYP3A4 substrates such as simvastatin, resulting in a higher serum simvastatin concentration and an increased risk of rhabdomyolysis. Serum levels of digoxin, a medication with a narrow therapeutic window, must also be monitored closely if used concomitantly with ticagrelor.24

Due to an increased risk of bleeding, ticagrelor has a black box warning cautioning against use in patients with a history of intracranial hemorrhage and active bleeding.24 It is also recommended to discontinue ticagrelor at least 5 days prior to CABG. It is important to note that the warning label advises to try managing bleeding episodes while remaining on ticagrelor as premature discontinuation increases the risk of cardiovascular events. Also included in the black box warning is the recommendation for use with aspirin 81 mg for efficacy. It is also advised against the use in patients with severe hepatic impairment.24 Dyspnea was a common adverse effect noted with ticagrelor, occurring in approximately 14% of patients studied within the first few weeks after medication initiation. Other noted adverse events include, symptomatic bradycardia, and ventricular pauses.24 There have been reported cases of increase in uric acid levels as well, so caution should be taken in patients with a history of gout (see Table 1 for comparison chart).

The safety and efficacy of ticagrelor in elderly patients is of particular concern because while this population is at increased risk of cardiac complications, they are also at higher risks of bleeding. Fortunately, the PLATO trial did not identify any difference in safety or efficacy between younger and older patients, although it is recommended that older patients be monitored more carefully for bleeding complications.

General Considerations: P2Y₁₂ receptor antagonists

Patients should be counseled on the
importance of continuing dual anti-platelet therapy for the full recommended duration because early discontinuation can result in recurrent cardiovascular events. Another important counseling area includes the increased risk for bleeding and patients should be taught to be aware of certain things, such as signs and symptoms of bleeding (dark colored urine and stool). These patients will bruise more easily, and take longer than usual to stop bleeding. They should promptly report any unanticipated, prolonged, or excessive bleeding immediately to their health care provider.

Pharmacist’s Role

With these newer anti-platelet agents, pharmacists can play a pivotal role in both monitoring and educating patients, whether in hospital, clinic, or community settings. Each of the agents discussed may provide enhanced benefit to specific patient populations. However, they also come with additional precautions, possible adverse events and interactions that must be carefully evaluated along with patient specific information, evidenced based research and clinical judgment to determine the best course of treatment. These new drugs provide extra tools in the health care provider arsenal for treating patients undergoing PCI with stent placement. As the medication experts, pharmacists are uniquely qualified to help match up the right drug to the right patient and ensure optimal treatment outcomes.

References

BMS = bare metal stent
PCI = Percutaneous coronary intervention
2C = Weak recommendation, low quality evidence
1B = Strong recommendation, moderate quality evidence
1A = Strong recommendation, high-quality evidence

Table 1. Comparison of P2Y12 receptor antagonists

<table>
<thead>
<tr>
<th>Drug</th>
<th>Clopidogrel</th>
<th>Prasugrel</th>
<th>Ticagrelor</th>
</tr>
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<tbody>
<tr>
<td>BMS: 1 month (1A), then 75 – 100 mg/day for 11 months (2C)</td>
<td>Continue aspirin therapy 75 -325 mg/day:</td>
<td>Continue aspirin therapy 75 -325 mg/day:</td>
<td>Continue aspirin therapy 75 -325 mg/day:</td>
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<td>BMS: 1 month (1A), then 75 – 100 mg/day for 11 months (2C)</td>
</tr>
<tr>
<td></td>
<td>Sirolimus-eluting stent: 3 months (1A), then 75 – 100 mg/day until 12 months (2C)</td>
<td>Sirolimus-eluting stent: 3 months (1A), then 75 – 100 mg/day until 12 months (2C)</td>
<td>Sirolimus-eluting stent: 3 months (1A), then 75 – 100 mg/day until 12 months (2C)</td>
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<tr>
<td></td>
<td>Paclitaxel-eluting stent: 6 months (1A), then 75 – 100 mg/day until 12 months (2C)</td>
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1A= Strong recommendation, high-quality evidence
1B= Strong recommendation, moderate-quality evidence
2C= Weak recommendation, low-quality or very low-quality evidence
PCI = Percutaneous coronary intervention
BMS = bare metal stent

Figure 1. Anti-platelet therapy recommendations from ACCP CHEST 2012 practice guidelines

Figure 2. Anti-platelet therapy recommendations from 2011 ACCF/AHA/SCAI practice guidelines
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CONTINUING EDUCATION QUIZ

Anti-platelet Therapy in Acute Coronary Syndromes: Updates in Therapy after Stent Implantation

1. Clopidogrel acts primarily by:
   a. Stimulating the ADP receptors on the platelet surface
   b. Increasing platelet aggregation via P2Y12 receptors
   c. Inhibiting the P2Y12 receptor on platelets
   d. None of the above

2. Which of the following statements is correct and may explain the differences in onset of action of the 3 drugs?
   a. Clopidogrel, prasugrel and ticagrelor are all pro drugs
   b. Only clopidogrel is a pro drug. Prasugrel and ticagrelor are active medications
   c. Only ticagrelor is a pro drug. Clopidogrel and prasugrel are active medications
   d. Both clopidogrel and prasugrel are pro drugs. Ticagrelor is an active medication

3. The black box warning for ticagrelor:
   a. Cautions against use in patients with a history of intracranial hemorrhage and active bleeding
   b. Warns that patients with genetic variability in their CYP2C19 allele may have reduced anti-platelet activity
   c. Advises against use in patients ≥ 75 years with the exception of high risk situations
   d. Advises to avoid use in patients with unstable angina due to increased bleeding risk

4. Which potential drug-drug interaction has continued warnings because of the potential increase in cardiovascular events with concomitant use?
   a. Clopidogrel and aspirin
   b. Ticagrelor and proton pump inhibitors
   c. Prasugrel and aspirin
   d. Clopidogrel and proton pump inhibitors

5. What is the minimum length of time for thromboembolic prophylaxis for PCI patients with a sirolimus-eluting stent on clopidogrel, ticagrelor or prasugrel?
   a. Patients may be transitioned off prophylaxis after 1 month if they are at low risk for a thromboembolic event.
   b. Treatment should be discontinued immediately after PCI if the patient is not in a high risk group
   c. Treatment should be continued indefinitely due to the high risk for thromboembolic events following PCI
   d. Most patients should be treated for a minimum of 12 months

6. The North American substudy of ticagrelor found that:
   a. Patients on lower maintenance doses of aspirin (< 300 mg) concomitantly with ticagrelor had better outcomes
   b. Ticagrelor is best taken on an empty stomach as higher gastrointestinal pH increases bioavailability
   c. Ticagrelor is teratogenic and should be avoided in patients who are pregnant or planning to become pregnant within 6 months
   d. Ticagrelor patients on aspirin therapy experienced significantly lower gastrointestinal complications when using a PPI for prophylaxis

7. Which of the following statements is incorrect?
   a. The active metabolite for ticagrelor binds reversibly to the P2Y12 receptor
   b. Clopidogrel requires dose adjustment for hepatic impairment
   c. Inter-patient genetic variability has less effect on prasugrel than clopidogrel
   d. All of the above statements are correct

8. Which of the following statements is correct regarding platelet inhibition?
   a. Clopidogrel has a faster platelet inhibition time than prasugrel but slower than ticagrelor
   b. All three drugs have similar platelet inhibition times
   c. Ticagrelor and prasugrel have faster platelet inhibition times than clopidogrel
   d. None of the above statements are correct

9. Which of the following is an appropriate protocol for dosing prior to a CABG procedure?
   a. Hold ticagrelor for 1 day prior to CABG
   b. Hold prasugrel for 7 days prior to CABG
   c. Hold clopidogrel for 2-3 days prior to CABG
   d. All of the drugs should be held no longer than 1-2 days prior to CABG

10. 55 year-old, 50 kg patient is admitted for STEMI, and is taken to the cardiac catherization lab for primary PCI. The patient has a past medical history of hypertension and a transient ischemic attack in 2005. Her renal and hepatic function are within normal limits. Current medications include aspirin 325 mg daily, metoprolol 25 mg twice daily, and atorvastatin 20 mg daily. Which of the following is the best recommendation for anti-platelet therapy for this patient?
    a. Clopidogrel 600 mg loading dose, then 75 mg daily
    b. Prasugrel 20 mg loading dose, then 10 mg daily
    c. Prasugrel 60 mg loading dose, then 10 mg daily
    d. Ticagrelor 180 mg loading dose, then 90 mg twice daily

Anti-platelet Therapy in Acute Coronary Syndromes: Updates in Therapy after Stent Implantation

ACPE UAN#0100-0000-12-069-H01-P
This activity is accredited for 1.0 hours of CPE credit (CEUs 0.10)
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ACTIVITY EVALUATION – Please indicate if the activity met the stated learning objectives:
1. Identify the mechanism of action and unique characteristics of the FDA-approved P2Y12 receptor antagonists used in secondary prevention of cardiovascular disease. AGREE DISAGREE
2. Describe the recent recommendations regarding safety and efficacy for oral anti-platelet therapy post cardiac-stent placement. AGREE DISAGREE.
3. Compare the benefits and risks associated with each P2Y12 receptor antagonists based on presented clinical data. AGREE DISAGREE
4. Select the appropriate anti-platelet therapy using patient-specific parameters for prevention of recurrent cardiac events. AGREE DISAGREE

Will the information presented cause you to make any changes to your style or method? Yes No
If you answered “yes” please list one or two things you will do differently:

Overall evaluation of the article content: (please circle one) Poor 1 2 3 4 5 Excellent

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