RWJBarnabas HEALTH

Pharmacy Updates from the 2019 ASHP Midyear Clinical Meeting

From the PGY-1 & 2 Pharmacy Residents Class of 2019-2020

Back from ASHP Midyear 2019: What we learned in the *Fabulous* Las Vegas

"So fun I wanted to Mandalay my departure"

Where: *Mandalay Bay Convention Center*
Las Vegas, Nevada

When: *December 7 – 12, 2019*

The RWJBH pharmacy residents participated in the 54th annual ASHP Midyear Clinical Meeting this past year along with more than 25,000 pharmacy professionals. This meeting is one of the largest gatherings of pharmacy practitioners in the world, and it took place this past December in Las Vegas, Nevada.

This meeting not only provided a platform for our residency programs to recruit future residents for the next residency year, but it also provided the residents opportunities for professional development. Many of the residents presented posters on the research they conducted this past year and participated in networking events where they advocated for our pharmacy enterprise at RWJBarnabas Health.

The residents also attended educational sessions offered at this meeting and summarized the clinical pearls in this newsletter for those unable to attend this year. These educational sessions were designed to update pharmacy personnel on the latest guidelines, clinical pearls and updates about the realm of pharmacy from across the world. The ASHP Midyear Clinical meeting has provided health system pharmacy practitioners with a enue for updating their knowledge, networking with colleagues and enhancing their skills.

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CE TITLE: YOUNG LEADERS, BIG RESPONSIBILITIES: PREPARING NEW PRACTITIONERS FOR ANTIMICROBIAL STEWARDSHIP
Speakers: Erin K. McCreary, PharmD, BCPS, BCIDP; Brandon Hill, PharmD, BCPS
December 8, 2019

Robert Wood Johnson University Hospital Somerset | RWJBarnabas HEALTH

Written by: Oumou Diawara, PGY-1 Pharmacy resident

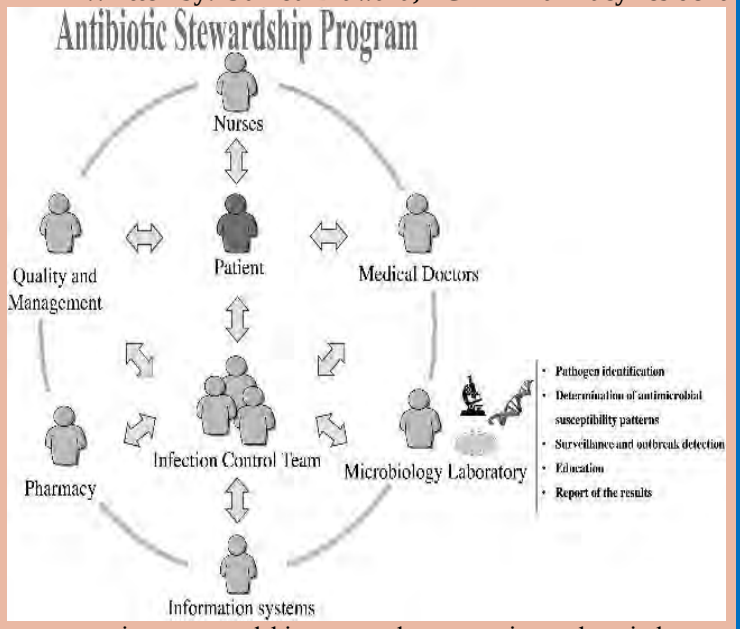
The importance of reducing overuse and misuse of antibiotics by promoting judicious use is a fundamental component of the idea of antimicrobial stewardship. In the human population, ensuring reasonable prescribing across different communities and settings, in different patient populations in diverse geographies, resources and cultures requires a genuinely innovative, adaptable, collaborative, and multi-disciplinary approach.

Center of Disease Control (CDC) estimates that about 50% of individuals are prescribed antibiotics and at least 80 million prescriptions each year are unnecessary. Some of the drivers that lead to over prescribing antibiotics are the following: lack of appropriate knowledge, inexperienced source of advice, economic factors, fear of poor clinical outcomes, and patient/customer demands.

Antibiotics can save lives and should be used when they are needed. Antimicrobial resistance is a global burden and understanding the drivers to resistance is critical to developing an effective implementation of stewardship interventions.

This continuing education (CE) has taught me the importance of the stewardship program, emphasizing the intuitive role the pharmacist plays and his/her impact on the entire program. It takes a team to implement and succeed in building a stewardship program; each part of that team(nurses, doctors, patient, pharmacy, microbiology laboratory and infection control) must be able to communicate effectively with others and be able to understand and cope with changing circumstances.

In summary, pharmacists are essential to antimicrobial stewardship because they provide broader knowledge of the use of antibiotics in the healthcare setting. Providers are the primary decision-makers regarding therapy, but they have limited knowledge of the pharmacokinetics/dynamics of the drugs. Young pharmacy leaders/practitioners can play a significant role in advancing antimicrobial therapy by being



present in stewardship rounds, creating hospital antibiograms, and taking part in infection control programs, pharmacokinetic monitoring, patient allergy assessment, IV to PO conversion, and development of formulary restrictions.

Strategies to gain success with antimicrobial stewardship initiatives

- Be proactive as a new practitioner in the antimicrobial initiative process and find a mentor along the way. It's up to you to challenge the status quo of inappropriate use of antibiotics.
- Develop effective communication among the participants of the Antibiotic Stewardship Program. Build strong relationships among the staff so they work as colleagues who want to share the most accurate information, not for their own glory, but for the betterment of the patient. Effective workflow will be built naturally when all participants share the same goal.
- Be mindful of establishing a sustainable way to reduce overuse of antibiotics. Educate the patient and other colleagues of the misuse of many antibiotics and the antimicrobial resistance that can develop.

References:
1. Barlam TF, Sara E. Cosgrove SEAbbo LM, et al. Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. *Clin Infect Dis* 2016 62(15):51-77.

RAPID DIAGNOSTIC TECHNOLOGIES AND ANTIMICROBIAL STEWARDSHIP: BETTER TOGETHER

Presented by: Katie Lusardi, PharmD, BCIDP, BCPS-AQ ID and Brandon Hill PharmD, BCPS
Summarized by: Morgan Esordi, PharmD, Newark Beth Israel Medical Center

OVERVIEW

This presentation reviewed the current Rapid Diagnostic Tests (RDT) available, how to design, implement, and monitor an RDT algorithm, and made suggestions for advocating for this technology to hospital management.

RDTS AVAILABLE

Blood Platforms
MALDI-TOF (Bruker, bioMerieux)
Accelerate Pheno System
Verigene (Luminex)
PNA Fish (OpGen)
BioFire (bioMerieux)
GeneXpert (Cephid)
T2Direct Diagnostics (T2 Biosystems)
ePlex BCID GNB, GP, Fungal (GenMark)
Respiratory Platforms
Unyvero (Curetis)
BioFire FilmArray RP 1 & 2 (bioMerieux)
BioFire Pneumonia Panel (bioMerieux)
MxTag (Luminex)
ePlex RP (GenMark)
Masal MRSA PCR (Various)

MAKING THE CASE FOR RDTS

The implementation of an RDT requires support from hospital and pharmacy administration. To attract the attention of executives, use a multidisciplinary team, incorporate the mission statement of the institution, and highlight previously published data. Administrators and pharmacy directors are most motivated by antimicrobial costs which differs from other members of the ASP. It is important to recognize this difference and appeal to the correct audience when making a persuasive argument for implementation RDT. The Centers for Medicare and Medicaid Services (CMS) does not reimburse institutions with high rates of hospital-acquired infections, publicly reports hospital ratings to the public, and is requiring hospitals to have active AMP. The Infectious Disease Society of America (IDSA) and Society of Infectious Disease Pharmacists (SIDP) recommend the use of RDT as a part of ASP to improve antibiotic use and clinical outcomes. The CDC core elements of antimicrobial stewardship can justify the onboarding of RDT.

MEASURING THE IMPACT OF RDTS

The metrics for evaluation recommended by the presented were as followed: Time to appropriate de-escalation or escalation of therapy, 30 and 90 day outcomes, cost-effectiveness, number of antimicrobial stewardship interventions, hospital length of stay, incidence of *C. difficile*, number of tests ordered correctly, and trends in resistance.

DEVELOPMENT & IMPLEMENTATION OF RDT ALGORITHM

When developing a RDT algorithm some of the things that need to be considered are what communication already exists, what level of communication is desired, and how this will work with the current tools in place in the hospital. An efficient process for proactive data collection and evaluation should be put in place alongside the implementation of an RDT. All impacted parties should be educated on the results and be prepared to adapt to the shortcomings of the algorithm.

Changing Lives Over 65: Keeping it Safe with New Beers Criteria

Presented by: Michelle A. Fritsch, PharmD, BCGP, BCACP; Melanie A. Dodd, PharmD, PhC, BCPC FASHP;
Mollie Ashe Scott, PharmD, BCACP, CPP, FASHP
Prepared by: Rachel Nottebart, PharmD, PGY-II Pharmacy Resident

2019 Beers Criteria Update

The American Geriatrics Society 2019 Updated AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults was published in January of 2019. There were a few notable changes to the guidelines. The updated guidelines include the addition of a new table of drugs with strong anticholinergic activity. This includes medications such as disopyramide, antidepressants, antiemetics, antihistamines, antimuscarinics, antiparkinsonian agents, antipsychotics, antispasmodics, and skeletal muscle relaxants. Anticholinergic medications should be avoided in older adults due to the risk for dry mouth, urinary retention, constipation, confusion, and falls. The updated guidelines also recommend digoxin be avoided as a first line agent for the treatment atrial fibrillation and heart failure, and doses be limited to ≤0.125 mg/day in older adults. Additionally, the guidelines recommend avoiding non-benzodiazepine, benzodiazepine receptor agonist hypnotics in patients with delirium. Glimepiride was added to the list of sulfonylureas to avoid. The guidelines also recommend that SSRI's should be avoided in patients with a history of falls or fractures and rivaroxaban should be used with caution for VTE or atrial fibrillation in adults 75 years or older.
Resource: americangeriatrics.org

Incorporation of Telehealth

Telehealth involves the distribution of health-related services and information via electronic information and telecommunication technologies. These technologies include videoconferencing, store-and-forward imaging, streaming media, and terrestrial and wireless communication. Telehealth services may be beneficial for geriatric patients as they may have difficulty obtaining transportation to doctors' appointments. Factors to consider when selecting a telehealth service include security, group size in video at a time, health information storage, various communication tools, customer service, and ease of use. Some telehealth platforms allow videoconferencing with multiple family members. This is especially beneficial for geriatric patients as often there are many family members involved in their care. Additionally, some platforms have representatives that help patients set up and connect to telehealth services in their home. Geriatric patients may be more technologically challenged, and may benefit from this level of assistance with telehealth.

Deprescribing Benzodiazepines

Benzodiazepines should be avoided in older adults due to the substantial risks associated with their use. These risks include motor vehicle accidents, impaired memory and attention, falls, hip fractures, confusion and delirium, hypoventilation, death (especially when used in combination with opioids), tolerance, and withdrawal. Discontinuing benzodiazepines can help increase alertness and energy and decrease the risk of harm. Various organizations caution against the use of benzodiazepines in the elderly. Choosing Wisely Canada recommends that they should not be used as first line for insomnia, agitation, or delirium. They also stress that they should not be initiated without a plan for discontinuation. However, they may be appropriate in some instances such as seizures and alcohol withdrawal. Tapering guidelines from deprescribing.org recommend decreasing the benzodiazepine dose by 12.5-25% every 2 weeks. If symptoms persist, the dose should be maintained for two weeks and then continued on the tapering schedule. Patients should be monitored for the signs and symptoms of withdrawal such as trouble sleeping, irritability, sweating, GI symptoms, anxiety, and seizures (with abrupt discontinuation).
Resources: www.medstopper.com and www.deprescribing.org

The Role of Pharmacists in Fall Prevention

One out of three older adults will fall this year, and 20-30% will suffer moderate to severe injuries. Falls are the leading cause of injury-related deaths among older adults and will account for an estimated $55 billion in fall-related direct medical costs in 2020. The CDC defines a fall as when a person descends abruptly due to the force of gravity and strikes a surface at the same or lower levels. This is an important distinction; a patient does not have to hit the floor to have a fall. Risk factors for falls includes gait impairment, vision problems, history of falls, home hazards, orthostatic hypotension, cognitive impairment, and some medications. Medications that may increase the risk for falls include anticholinergics, anticonvulsants, antidepressants, antihistamines, antipsychotics, benzodiazepines, opioids, sedative-hypnotics, medications effecting blood pressure, and muscle relaxants. STEADI-Rx is a program designed by the CDC and the University of North Carolina Eshelman School of Pharmacy and School of Medicine. STEADI-Rx provides tools for pharmacists to screen, assess, and intervene to reduce the risk of falls and improve outcomes in geriatric patients.
Resources: cdc.gov/steadi

SPEAKING FROM THE HEART: GREAT DEBATES IN CARDIOLOGY

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Mathew P. Lillyblad, PharmD, BCCCP, BCPS-AQ; Ted Berei, PharmD, MBA, BCPS, BCCP;
William L. Baker, PharmD, FCCP, FACC, FAHA; Brent N. Reed, PharmD, BCCP

Hirra Khan, PharmD
PGY-1 Pharmacy Resident

To Do or Not to Do: Aspirin for Primary Prevention in Cardiovascular Disease (CVD)

Over 35 million people in the United States have started aspirin without consulting with their healthcare providers. Studies have shown that aspirin does not reduce fatal cardiovascular events in those patients without an established CVD. Therefore, the use of aspirin should be selected with caution due to increased risk of major bleeding. The 2019 American College of Cardiology/American Heart Association guidelines recommend considering low dose aspirin (81 mg/day) among adults 40-70 years of age who are at high risk of CVD but not at increased risk of bleeding. Specifically, patients with diabetes, hypertension, dyslipidemia, and smokers may benefit from aspirin use as they are at high risk for having a cardiovascular event. Furthermore, the guidelines recommend against aspirin use for CVD prevention among adults > 70 years of age. These recommendations suggest that aspirin use should be individualized based on CVD and bleeding risk.

Cardiovascular Benefits: Glucagon-Like Peptide 1 (GLP-1) Agonists or Sodium Glucose Co-Transporter 2 (SGLT-2) Inhibitors in Type 2 Diabetes

GLP-1 agonists are injectable agents that increase glucose dependent insulin secretion, decrease glucagon secretion, slow gastric emptying, and improve satiety. SGLT-2 inhibitors are oral agents that inhibit the SGLT-2 protein expressed in the proximal renal tubules and reduce reabsorption of filtered glucose. According to the 2019 American Diabetes Association guidelines, GLP-1 agonists and SGLT-2 inhibitors are second line agents to metformin in those with established atherosclerotic CVD. Both classes of medications have shown to reduce major cardiovascular events in randomized controlled trials. Agents including liragluitde (GLP-1 agonist) and empagliflozin (SGLT-2 inhibitor) have further shown to reduce cardiovascular mortality. Additionally, GLP-1 agonists have shown superior glucose lowering and body weight reduction compared to SGLT-2 inhibitors. Given these findings, the selection between these agents largely depends on factors such as cost, ease of administration, and side effect profile.

Volume Overload Management: Tolvaptan for Acute Decompensated Heart Failure (ADHF)

Tolvaptan is an oral vasopressin receptor antagonist that exhibits an aquaretic effect; the excretion of water without electrolyte loss. Tolvaptan effectively increases urine output and reduces body weight; however it has not shown to improve dyspnea and other symptoms of ADHF. This is an important clinical parameter in ADHF management. Compared to loop diuretics used in ADHF, tolvaptan has minimal effects on renal function and does not have negative effects on electrolytes. However, the use of tolvaptan should be restricted to severe hypervolemic or euvolemic hyponatremia states due to its lack of efficacy in heart failure and the high cost associated with it.

The First Order: Detecting and Overcoming Resistant Hypertension in Ambulatory Care

Speakers: Karen M. Gunning, PharmD, BCPS, BCACP, FCCP; Evan Sisson, PharmD, MSHA, BCACP, CDE, FAADE

Authored by: Sareli Bonilla, PharmD, PGY-1 Pharmacy Resident, Saint Barnabas Medical Center

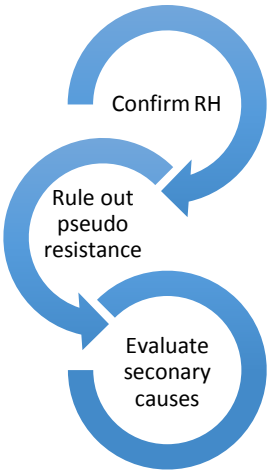
Resistant Hypertension is defined as a patient above goal blood pressure despite being on 3 hypertensive medication classes at maximum or maximally tolerated doses or controlled hypertension with use of 4 or more medications. This patient population is important to identify due to the higher risk for retinopathy, stroke, chronic kidney disease, myocardial infarction and heart failure. Management of these patients can be challenging, if the appropriate steps are not taken to determine if the patient is truly resistant. Approximately, 20% of resistant hypertension patients have primary aldosteronism. This year's 2019 ASHP clinical meeting, two ambulatory care pharmacist discuss several studies that explored the reasoning behind the resistance and provided a step wise approach to managing this patient population.

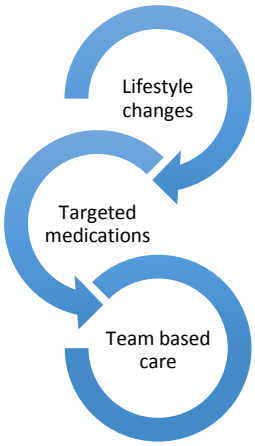
Stepwise approach:

Step 1: Confirm resistant hypertension by ruling out other causes such as white coat hypertension, measurement error and adherence issues. It is essential to confirm patients are aware how to check their blood pressure at home by reviewing recommendations such as 2 readings at least 1 minute apart, checking first thing in the morning before medications and in the evening before bed. To avoid measurement error, assure the proper cuff size is used and obtain an average of 2 blood pressure measurements. To address adherence issues, evaluate lifestyle management such as diet. Emphasizing importance of maintaining a low salt diet, <2400 mg/day. Weight loss of 5 – 10% is essential as well as physical activity to reduce blood pressure. Recommend avoiding (if possible) agents that can increase blood pressures such as NSAIDs, estrogen containing contraception, sympathomimetic/amphetamines, antidepressants, and cyclosporine or tacrolimus.

Step 2: Managing secondary causes of hypertension such as sleep apnea, primary aldosteronism and drug induced. Identifying cause for hypertension can guide appropriate selection of medication therapy.

Step 3: Plan development. Patients may increase their medications to the maximally tolerated dose or add another drug class agent for further blood pressure lowering. Using agents such as spironolactone for patients with resistant hypertension have been shown to decrease systolic blood pressure (SBP) especially in individuals with primary aldosteronism.





A Little Pain for a Lot of Gain: Unique Strategies to Reduce Vaccine-Preventable Diseases

Presenters:
Jaime R Hornecker, PharmD, BCPS, CDE, DPLA *and*
Shanna O'Connor, PharmD

Recognizing Barriers to Immunization

Misinformation	Misconceptions	Lack of Information	Accessibility	Systemic / Operational obstacles

Opportunities to Improve Immunization

Human Papillomavirus Vaccination

- Interventions are focused on the education of healthcare providers as well as patients on the benefits of HPV immunization, and dispensing myths at every opportunity.
- Identification of patients is an important aspect involving a registry of patients as well as offering vaccination at all patient visits. To expedite the intervention, standing orders were utilized along with workflow reminders set in place to remind all staff in continuing to identify eligible patients

Vaccine Series Completion for Hepatitis A & B

- A recognized need was seen regarding hepatitis A and B vaccination series with the goal of expanding vaccine series completion in all patients and not just those with hepatitis C. Patients were contacted by the pharmacy staff 5 days prior to the next vaccine in series due as well as the prescriber contacting the patient if needed.
- Through the efforts of vaccine series completion effort, support was provided by pharmacy technicians to reach a greater number of patients. Technicians can further be involved an paperwork review, drawing up doses of vaccinations, patient identification and general workflow processes

Composed by:
Vasyl Zbyrak, PharmD
Saint Barnabas Medical Center
PGY-1 Pharmacy Resident

THIS WILL NOT HURT A BIT: APPLYING PHARMACOGENOMICS TO PAIN MANAGEMENT

Written report completed by Rebecca Rainess, PharmD

Presented at the ASHP meeting by:
Jordan Baye, PharmD, MA, BCPS and Natasha Petry, PharmD, BCACP

Of the pharmacogenomic interactions seen as pharmacists we need to be concerned about the strongest interaction which is the drug-gene CYP2D6 interaction. In general, when we think of CYP2D6 poor metabolizers in regards to pain medications we think decreased analgesia verse rapid metabolizers have an increased toxicity. There are certain opioids that are not affected by the CYP2D6 including: buprenorphine, fentanyl, hydromorphone, methadone, morphine, and oxymorphone. Currently there are two assignments that are used for accessing CYP2D6 status.

To access the functional status with an allele activity score:

- Increased (CYP2D6 allele 1xN and*2xN has an activity core of >1)
- Normal or increased (CYP2D6 allele 17xN and*41xN has an activity core of 1 to >1)
- Normal (CYP2D6 allele *1 and*2 has an activity core of 1)
- Decreased (CYP2D6 allele *17 and *41 has an activity core of 0.5)
- No function (CYP2D6 allele *4 and *5 has an activity core of 0.5)

Another assessment that can be completed is the CYP2D6 phenotype assignment:

- Ultra-rapid (activity score >2.0, diplotype example: *1/*1xN)
- Normal (activity score 1.0-2.0, diplotype example: 1/*1, *1/*41z)
- Intermediate (activity score 0.5, diplotype example: *4/*10)
- Poor (activity score 0, diplotype example: *4/*5)

When comparing these two phenotype-genotype assignments there is a wide variety seen and a lack of a consensus with certain alleles like *10. There is currently some proposed CYP2D6 revisions such as: downgrade activity score of 1 to intermediate, downgrade CYP2D6 *10 allele to a score of 0.25; increase the score of 2.25 in the intermediate phenotype; as well as no addition of a rapid metabolizer group.

One recent study published by Smith and colleagues that looked at pharmacogenomic guided prescribing verse usual care in regards to opioid dosing. It found that in the guided group the patients had a 30% reduction in their pain intensity verse the usual care group. There is limited clinical information on COMT, OPRM1, ABCB1 thus these are not actionable at this time due to conflicting evidence.

The non-opioid pain medication management is in need of more research to help put forth guideline recommendations.

ADDRESSING OPIOID USE DISORDER AND THE OVERDOSE EPIDEMIC AT AN URBAN ACADEMIC MEDICAL CENTER

Presenter: Kevin J Horbowicz, PharmD, BCPS
By: Lauren Allen, PharmD
PGY-1 Pharmacy Resident
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The opioid epidemic has been declared a public health emergency by the U.S. Department of Health and Human Services. Boston Medical Center made it a priority to respond to the crisis by focusing their efforts to three categories (Figure one). The first implementation was to reduce inpatient utilization of opioids with the addition of a new surgery shift for pharmacist and repurposing existing shifts to extend coverage to the evenings and the weekends. Also, all pain scale range orders were modified to remove opioids for mild pain, (pain scale 1-3) and other order sets were updated to increase acetaminophen and ibuprofen usage to limit the use of opioids. The second focus was to reduce discharge prescribing of opioids by setting a goal to increase the percent of discharge prescriptions written for less than or equal to 90 morphine milligram equivalents and 7 days to 90%. The third implementation was to treat addiction and prevent overdoses by establishing a treatment algorithm for opioid use disorder in the emergency department. This included training sessions for employees, patients, and community organizations on naloxone, and promoting the prescribing of naloxone when appropriate. The results of these implementations are displayed below.

Figure one:

2,094 Opioid-related overdose deaths in Massachusetts in 2016

25% Reduction in inpatient opioid utilization at BMC

73,637 Fewer opioid dosage forms dispensed to the community

The Pain Debates: What ARE the right choices for 2020 and beyond?

Tim Atkinson, PharmD, Ernest Dole, PharmD, Jeffrey Fudin, PharmD, Lee Kral, PharmD
By Leo Batongbakal, PharmD

Opioids, benzodiazepines, and medical marijuana are all undoubtedly controversial and relevant topics. The opioid crisis not only showed us the devastating and deadly effects of addiction, but also the need for mental health awareness. With ongoing societal efforts to break the stigma of mental health, people are starting to feel more comfortable seeking professional help. However, psychotropics often have an extensive side effect profile, and medications like benzodiazepines can be as toxic and addicting as opioids. Some patients take their chances on medical marijuana to treat their intractable conditions, as they believe that the benefits outweigh the known and unknown risks. In this Continuing Education Session, clinical pharmacy pain specialists debated three different topics, which are summarized below.

Debate #1: Should opioid use in cancer pain be approached with the same opioid guidelines and dose limitations as any other chronic pain?

For	• Chronic Cancer Survivor Pain (CCSP) is a chronic pain condition • Cancer is not protective against opioid addiction, so patients/survivors are still at risk • FDA does not make a distinction between cancer and non-cancer chronic pain
Against	• CDC Guideline on Opioid Prescribing is not intended to be applied to cancer-related pain • CDC also stated the agency does not want to deny clinically appropriate opioid therapy to patients undergoing cancer treatment or with CSSP • Cancer survivors describe facing stigma with their opioid use from providers and society
Final Stance	Opioids should be used in conjunction with risk management, even in patients with cancer. Absolute dose limits sometimes do no make sense in clinical practice.

Debate #2: Should benzodiazepines be considered first line agents for anxiety?

For	• SSRIs and all other antidepressants contain a Black Box Warning of suicidality • Therapeutic index is high and mortality rate is very low if used alone
Against	• Dose-dependent increased risk for overdose, especially when used with opioids • 2011 NICE Guidelines only recommends benzodiazepines as a short-term (4-6 weeks) treatment during a crisis. Not recommended for generalized anxiety or panic disorder. • Debilitating persistent cognitive deficits
Final Stance	Benzodiazepines are associated with less risk when used as monotherapy for anxiety but should not be considered first line therapy.

Debate #3: Should cannabis be considered a legitimate therapy for chronic pain management?

For	• Studies are flawed and small with low-strength evidence of benefits • Short-term and long-term adverse effects, along with dependence and withdrawal • Zero-tolerance drug policies in the workplace
Against	• Potential therapeutic effects, like pain relief, with no recorded deaths from overdoses • 2018 European Pain Federation recommends cannabis as a 3rd line agent for chronic pain and a reasonable option for neuropathic pain • Approval of medical cannabis outpaces scientific research due to legal barriers in the US • No standardization of doses or evidence of benefits because of lack of quality studies
Final Stance	Cannabis is still a controversial therapy, with benefits and risks still being studied.

A ROADMAP OF OVER-THE-COUNTER (OTC) AND HERBAL ANALGESIC THERAPIES FOR PAIN

Presented By:
Tanya J. Uritsky, Pharm.D., CPE
Christopher Herndon, Pharm.D., BCACP, FASHP

At the 2019 Midyear Clinical Meeting, Dr. Uritsky and Dr. Herndon provided a continuing education presentation focused on the risks and benefits of various OTC and herbal analgesic therapies. The presentation started off with a patient case, in which Ginger enters the pharmacy seeking help for pain in her hands. She informs you, the pharmacist, that the physician has diagnosed her with osteoarthritis. She also tells you about her current medication list. The program continues to explore treatment options for the patient case, focusing on OTC medications, herbals, and CBD.

When reviewing the OTC analgesics, Dr. Herndon discussed some familiar systemic options, including acetaminophen, aspirin, magnesium salicylate, naproxen, ibuprofen, and ketoprofen. Despite being listed, Dr. Herndon pointed out that ketoprofen was pulled by the manufacturer in 2005 as an over the counter item. Ketoprofen 12.5 mg tablets were pulled at a time when public troubles arose with other NSAIDs regarding increased cardiovascular risks. While this medication was pulled without much publicity, the FDA released a statement that the product was not withdrawn for reasons of safety or effectiveness.

Acetaminophen was the first option that was reviewed in greater detail. The max dose of acetaminophen has been debated between either three or four grams. While the FDA still considers the maximum dose to be four grams, institutions are increasingly leaning towards a three gram maximum as higher doses can still be hepatotoxic. In a similar discussion, the labeled maximum dose of ibuprofen is 1200 mg. However, Dr. Herndon noted that doses of up to 3200 mg may be used in institutional settings when patients receive mucosal protection. Risk of GI bleed is a significant concern with NSAIDs, specifically ibuprofen and naproxen which carry the greatest risk.

Arthritis is listed as the sixth most common condition treated with complimentary alternative medicine. Herbal remedies reviewed in this portion of the presentation include capsaicin, glucosamine, chondroitin, SAMe, MSM, and Devil's Claw among others. Capsaicin is an OTC item, derived from the chili pepper, which has shown to decrease pain severity and improve tenderness on passive range of motion. Glucosamine and chondroitin are often found in combination. Supplementation with glucosamine/chondroitin has shown to reduce knee-joint-space narrowing over time and is generally well tolerated. Supplements such as ginger and fish oils do not appear to have any significant effects in osteoarthritis and would serve as inferior recommendations for the patient case. Additionally, CBD has no current evidence to support its use in osteoarthritis, though many patients are now gravitating toward this product for widespread use.

Upon review of potential OTC and herbal analgesics, Dr. Uritsky brought the audience back to the patient case. The audience chose to recommend capsaicin for our patient, Ginger, seeking a medication to treat her osteoarthritis. Dr. Uritsky was able to provide counseling to the patient regarding capsaicin use. This presentation provided an evidence-based review of OTC/herbal analgesic options, encouraging pharmacists to make appropriate recommendations and follow with useful counseling information.

Jenna Petro, Pharm.D.

Medication-Induced Depression and Suicidality: What Does the Evidence Say?

Rajwoana Ahmed (Jisa), PharmD

During the 2019 ASHP Midyear Clinical Meeting, Dr. Maroney, Dr. Chavez, and Dr. Smith presented a continuing education presentation on the evidence behind depression and suicide warnings that are associated with several medications commonly utilized. The program explores research on specific products that carry the warning, how FDA guidance on this topic has changed over the years, and how suicidality is assessed in clinical trials. Ending with interactive clinical cases, this program offered several key points that pharmacists should keep in mind in their day to day practice.

In the first portion, Dr. Maroney explains that several of the medications that carry a warning for depression and suicidality in patients up to 24 years old are based off of case report data and not clinical trials. In the case of medications for the treatment of depression, all drugs within this class carry the warning even if the product was not individually evaluated. From evaluating several meta-analyses, she concludes that the benefits of antidepressant treatment generally outweigh the risks of its associated warnings involving suicidality. Antiepileptics were the next class of medications evaluated that carry a warning for increased risk of suicidal thoughts and behaviors. A consensus statement was published indicating that the literature behind the warning shows conflicting data and risk of suicidality appears to be low.

Data on several other non-psychiatric medications that carry a warning for increased risk of depression or suicidality were assessed in the presentation. Regarding antiretrovirals, it has been recommended to avoid Efavirenz and Rilpivirine in patients with a psychiatric history and patients on dolutegravir should be closely monitored. Glucocorticoids had the highest risk of dose dependent psychiatric side effects in the first three months of use. Patients on isotretinoin should be monitored for psychiatric symptoms at each appointment with the prescriber. The risk of mood related adverse effects associated with Varenicline is lower than previously thought according to an FDA update from 2016. Several other medications were discussed with an overall emphasis on assessing patients for psychiatric symptoms at baseline and monitoring throughout therapy.

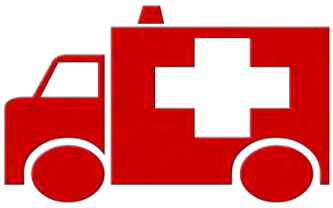
The presentation further described changes in FDA guidance regarding assessing risk of suicidality. Key changes involve the recommendation to utilize the Columbia-Suicide Severity Rating Scale (CSSRS) at baseline and at each patient visit during clinical trials, to evaluate suicidal ideation and suicidal behavior as separate endpoints, and to identify which trials this guidance is appropriate for (not appropriate for cognitively impaired patients). This FDA guidance was further critiqued in the presentation as Dr. Smith inquired about patients that don't fall into one of the specific forms of suicidal ideation described in the screening tool. He concluded by recommending to evaluate the methods used in clinical trials for new drugs that carry psychiatric warnings and to be active in reporting any ADRs.

To conclude, Dr. Chavez presented patient cases that prompted audience participation. How to approach counseling on these side effects and evaluating different approaches to treatment were discussed. Overall, this information encourages pharmacists to evaluate medications and patients on an individual basis and incorporate evidence based data in their clinical decision making.

Emergency Medicine Pearls 2019

Moderator: David E. Zimmerman, PharmD, BCPS, BCCCP

Angela Antoniello, PharmD
PGY1 Pharmacy Resident at Saint Barnabas Medical Center



Intranasal Lidocaine: Taking the Headache Away from Treating Migraines

Presenter: Hina Patel, PharmD, BCPS

When determining an appropriate agent for the treatment of migraine pain, oral or intravenous (IV) opioid-sparing medications are often utilized. However, when standards of care do not provide relief, providers are left to determine what other options may be available. When utilized alone or as an adjunct treatment to either prochlorperazine or metoclopramide, administration of localized lidocaine may demonstrate migraine relief. When applied via cotton-tip applicators or pump sprays intranasally (IN), the neuronal transmission of signals via the sphenopalatine ganglion, which is linked to the trigeminal nerve, is blocked. The onset of pain relief occurs in approximately 15 minutes and lasts for 30 minutes to two hours. Relative contraindications for this treatment include a history of epilepsy, penetrating head trauma, hemodynamic instability, and lidocaine allergy.

Dexmedetomidine: another use that's been right under your nose

Presenter: Danielle Burton, PharmD

Dexmedetomidine is an α-2 agonist with sedative, anxiolytic, and analgesic properties due to its receptor specificity in the spinal cord and central nervous system. It is commonly used for both perioperative anesthesia as well as sedation. Its role in procedural sedation alone or in combination with ketamine, propofol, midazolam, and other agents has been established through past research. In the emergency department, access for medication administration may especially be a barrier to treatment in pediatrics. IN administration is beneficial due to its wide absorption in a highly vascularized area, avoidance of first-pass metabolism, and its ability to avoid IV placement. The onset of IN dexmedetomidine is approximately 13 to 25 minutes, and it lasts for about 85 minutes. In pediatrics, studies have demonstrated that IN dexmedetomidine is a safe alternative to IN midazolam for procedural sedation when dosed at 1 to 4 micrograms per kilogram.

Droperidol Dropped, But Back Again!

Presenter: Clare McMahon, PharmD

Droperidol is a butyrophenone dopamine D_2 antagonist that is indicated for the treatment of headache, agitation, or nausea and vomiting. The addition of a black box warning based on MedWatch case reports for QTc prolongation in the early 2000s led to the declined use and subsequent discontinuation of this product. However, a 2015 study concluded that droperidol is safe and effective for rapid sedation in acute agitation. There is insufficient evidence to require EKG monitoring for doses under 2.5 mg, and intramuscular doses up to 10 mg appear to be as safe and effective as other medications used for this indication. As production has recently resumed after studies demonstrated safety in these specific doses, it is likely that droperidol will once again be utilized for acute agitation. Caution should be exercised in patients that are at a high risk for development of QTc prolongation.

KEEPING THE DOORS OPEN: USING METRICS AND BENCHMARKS TO SUSTAIN YOUR AMBULATORY CARE PRACTICE

CHRISTINA DEREMER PHARMD, BCPS, BCACP, FASHP
JEFF OLSEN PHARMD, MBA, BCPS, BCACP
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BY: RAHUL JACOB PHARMD
PGY-2 AMBULATORY CARE PHARMACY RESIDENT

Background

An Ambulatory Care Pharmacist (ACP) role is built on the foundation of trust and helping. The ACP is trained to be the voice of the patient and to improve their health through personalized care, education and empowerment. However within healthcare, metrics are the vocabulary of communication and the value of an ACP must be proven. Ambulatory care metrics and benchmarks are important to obtain reimbursement, illustrate pharmacist impact, determine resources needs, inform scalability of practice, communicate pharmacist productivity and identify best practices.

"Ambulatory Care Pharmacist's do great work and it is important to be able to translate these meaningful results to the appropriate stakeholder "

Metrics and Benchmarks

The most apparent outcome measures include clinical markers such as percentage of patients that have attained goal BP and HgbA1c. Other clinical markers include event occurrence, statin use, readmission rates, medication adherence, disease progression, screening completion and mediation therapy problems. Various studies have evaluated and proven the increased impact of clinical pharmacists on efficiency metrics including time to target, provider time saved, time per encounter, patient access to care and interventions made. Often ACP's are requested to offset a portion of their salary through financial metrics. These metrics can include cost of per member per month (PMPM) reduction, incentive contribution, cost savings, revenue generated, return on investment and using shared appointments to increase RVU's obtained.

Lastly a huge component of metrics that is often overlooked is satisfaction. This satisfaction does not refer to just patients' but also providers' experience with the collaboration. In the current structure of primary care, it is pivotal to gain provider buy-in and support in order to elevate the practice of an ACP. Quantifying this satisfaction through patient experience surveys, provider surveys, stories, and burnout reduction will also help illustrate value.

Speaking the Language

Now that we have identified a variety of metrics, it is vital to be able to translate these meaningful results to the appropriate stakeholders. For example, when advocating for physician support quality/disease state, burnout survey and increased wRVU's will be the focus. When delivering value statements to C-suite executives however the concentration will be on increased access to care, increased patient satisfaction, decreased readmissions and increased wRVU's. Leveraging health plan support is also obtainable with similar metrics.

What's New in Critical Care Pharmacy Practice?

Presented at ASHP Meeting by: Scott Bolesta Pharm.D., BCPS, FCCM, FCCP (Wilkes University), William Dager Pharm.D., BCPS, FASHP, FCCM, FCCP, MCCM (University of California, Davis Medical Center), Robert MacLaren Pharm.D., M.P.H., FCCM, FCCP (University of Colorado School of Pharmacy), Gilles L. Fraser Pharm.D., B.S.Pharm., MCCM (Maine Medical Center)
Summarized by: Harleen Gill, PharmD, PGY-1 Pharmacy Resident

The recommendations from the 2018 Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation, Delirium, Immobility and Sleep Disruption in Adult Patients in the ICU (PADIS) were reviewed and evaluated. Pain is a prevalent issue in ICU patients which should be assessed using the Critical Care Pain Observation Tool (CPOT). For management of pain various pharmacologic therapies are recommended such as opioids, acetaminophen, ketamine and neuropathic agents depending on the type of pain. Analgosedation is a term mentioned in the guidelines stating that pain should be adequately treated before sedation. In terms of sedation, there is a continued emphasis on avoiding deep sedation because studies have shown shorter time to extubation and reduced tracheostomy rates with lighter levels of sedation. Therefore, patients should be titrated to light levels of sedation and have daily sedation vacations to reassess their need for sedation. Dexmedetomidine and propofol are both preferred over benzodiazepines. Delirium occurs in about 50% of ICU patients and is associated with longer hospital stays and increased mortality in some studies. Risk factors for developing delirium include age, blood transfusions, continuous benzodiazepine infusions, and pre-ICU emergency surgery or trauma. The speakers briefly mentioned a story about one of their patients who developed delirium in the ICU and the patient remembers thinking that the hospital staff were all chickens drawing his blood and pecking at him since they all came in with yellow gowns as the patient was on contact precautions. It is important that all critically ill patients should be regularly assessed for delirium with the Confusion-Assessment Method for ICU (CAM-ICU). In terms of prevention of delirium, the guidelines do not recommend using haloperidol, atypical antipsychotics, dexmedetomidine, statins, or ketamine. The literature does not clearly support the use of antipsychotics for treatment of delirium either. The ABCDEF bundle should be used for managing ICU patients overall. The acronym stands for Assess/prevent/manage pain, Both spontaneous awakening trials and spontaneous breathing trials, Choice of analgesia and sedation including depth of sedation, Delirium: assess prevent, and manage, Early mobility and exercise, Family engagement and empowerment. This bundle has been shown to improve all outcomes including mortality, ICU and hospital discharge, time on ventilator, coma, delirium, ICU readmission and discharge except for pain. Pain was reported more frequently, but that is attributed to the fact that patients are more awake and experiencing and reporting more pain. Overall, the speakers suggest utilizing this multi-component bundle in all ICU patients on a daily basis to help improve outcomes.

Stress ulceration is also commonly seen in ICU patients. Physiologic stress can lead to mucosal ischemia, which then can cause impaired hydrogen ion removal, impaired defense mechanisms, and impaired blood flow leading to stress ulceration. The goals of stress ulcer prophylaxis include preventing gastrointestinal bleeding, reducing mortality and morbidities associated with bleeding, minimizing adverse events, and optimizing cost-effectiveness. The literature shows that H2RAs and PPIs reduce acid exposure and may limit reperfusion injury. The 1999 ASHP guidelines state that patients that will be mechanically ventilated for greater than 48 hours or if they are coagulopathic (platelets <50,000; INR >1.5; aPTT>2x control) should receive stress ulcer prophylaxis.

Other indications where prophylaxis can be given if more than two risk factors are present are history of GI ulceration or bleed in the past year, ICU length of stay greater than 1 week, hydrocortisone >250 mg/day (or equivalent), traumatic brain injury, major burn injury, shock, trauma, transplant, and acute hepatic or renal failure. In terms of choosing an agent for stress ulcer prophylaxis, the literature is mixed for supporting the use of PPIs and H2RAs. A meta-analysis conducted in 2016 showered that there was no difference in pneumonia, C. difficle infections, or mortality between PPIs and H2RAs. Gastric pH> 4 for greater than 12 hours is associated with more gram-negative microbial growth in the stomach which is why infections such as pneumonia and C. difficile can be seen with this acid suppressive agents. However, each patient must be carefully evaluated in the ICU to determine whether the benefits of prevention of an upper GI bleed outweigh the potential risks associated with these agents. Stress ulcer prophylaxis is not recommended for patients in a non-ICU setting and should therefore be discontinued for patients once they are leaving the ICU or once they are extubated and no longer meet prophylaxis criteria.

The last topic discussed was the management of heparin induced thrombocytopenia (HIT) in critically ill patients. The four T's (thrombocytopenia, timing of onset, thrombosis, and other causes of platelet fall) should be assessed in patients suspected of HIT. If the value for this pretest probability estimate for HIT is high, then the patient may have HIT and treatment options should be discussed in addition to discontinuation of all heparin agents. When switching from heparin the direct thrombin inhibitors argatroban, bivalirudin, and fondaparinux can be considered. Bivalirudin has the most evidence to support its use especially in patients with acute coronary syndrome. When picking an agent for HIT all of the patients underlying disease states, liver and renal function should be considered. In terms of duration of treatment for isolated HIT generally about 4 weeks of therapy are recommended. If thrombosis was present with HIT, then duration of treatment should be extended to about 3 months of therapy.

Navigating Diabetes Clinical Guidelines: A Patient-Centered Roadmap

CE Speakers: Diana Isaacs, PharmD, BCPS, BCACP, BC-ADM; Kristi W. Kelley, PharmD, BCPS, BCACP, BC-ADM, CDE

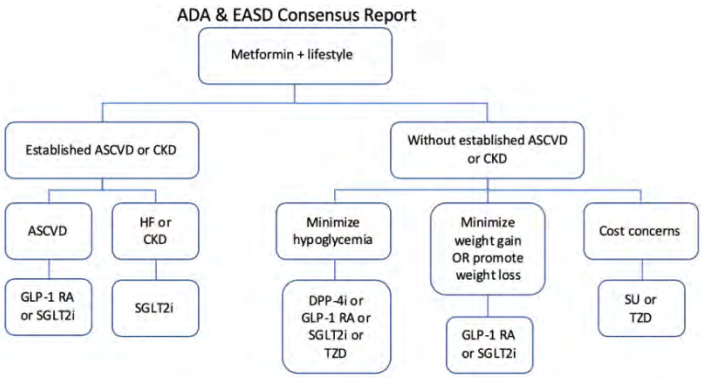
By: Andrew Tsai
PGY-1 Pharmacy Resident
Robert Wood Johnson University Hospital Somerset

At ASHP Midyear 2019, I had the opportunity to attend a continuing education (CE) session regarding the current management of patients with diabetes. With new clinical data and evidence from unique drug classes being released regularly, diabetes guidelines are often revised to reflect updated clinical practice recommendations and advances in treatment.

Before speaking about these updates, Dr. Diana Isaacs first highlighted some of the important findings from recent clinical trials. With newer agents like the glucagon-like peptide-1 receptor agonists (GLP-1 RA), there are additional benefits expanding upon decreases in HbA1c. Most importantly, there is a decrease seen in cardiovascular events through various mechanisms such as increased ischemia tolerance in the heart and increased plaque stability in the peripheral arteries. Aside from cardiovascular benefits, there is emerging evidence of valuable renal effects from GLP-1 RA use, including reductions in albumin excretion. In the REWIND trial, dulaglutide lowered the incidence of major adverse cardiovascular events when compared to placebo. PIONEER-6, a noninferiority trial comparing oral semaglutide to placebo, reported that the oral GLP-1 RA did not have a worse cardiovascular risk profile.

Another class of medications being brought to the forefront of diabetes management, sodium-glucose co-transporter-2 inhibitors (SGLT2i) have also exhibited similar cardiovascular and renal benefits. In addition to decreasing preload and afterload on the heart, SGLT2 inhibitors can help manage other cardiovascular risk factors including blood pressure, weight, and glucose control. In the CREDENCE trial, canagliflozin had a 30% lower relative risk in terms of the composite outcome of end-stage kidney disease, doubling the serum creatinine, or renal or cardiovascular death compared to placebo. Not only do SGLT2 inhibitors assist with diabetes management, but the drug class may also be carving out a significant role in heart failure management as well. DAPA-HF revealed a reduction in the risk of worsening heart failure or death from cardiovascular causes among those who received dapagliflozin than among those who received placebo. Interestingly, these benefits were similar in patients with or without diabetes.

As the American Diabetes Association's Standards of Care is considered a living document, the guidelines incorporate all of the most up to date information. Given the positive results of recent trials, new recommendations call for the increased use of two drug classes to treat specific patient populations. While metformin is still considered first-line, patients with established cardiovascular disease or kidney disease may achieve greater benefits from additional agents such as GLP-1 RA or SGLT2 inhibitors.



Call or Fold on Triple Therapy Post Stent? Antithrombotic Strategies to Avoid a Bust

Authored by:
Sunny Sheth, PharmD
Newark Beth Israel Medical Center

Speakers:
Christopher Betz, PharmD, BCPS, FASHP, FKSHP
Snehal Bhatt, PharmD, AACC, BCPS, FASHP

Background:

Triple therapy refers to the concurrent use of an anticoagulant with dual antiplatelet therapy (DAPT). Triple therapy is most commonly prescribed to patients with atrial fibrillation (AF), who have also undergone percutaneous coronary intervention (PCI) with stent insertion for management of their acute coronary syndrome (ACS).

Recommendation for Anticoagulation in AF:

Patients with AF are at a very high risk of suffering from a stroke. As per 2019 AHA/ACC/HRS Focused Update on AF, anticoagulation is recommended for patient with CHA_2DS_2-VASc ≥ 2 as a prophylaxis for stroke prevention. This recommendation assumes that the expected benefit > bleeding risk.

Recommendation for DAPT in ACS:

Patients with ACS are at a very high risk of suffering from recurrent ischemic event or stent thrombosis (in patients with stent placement). As per 2016 ACC/AHA DAPT Focused Update, patient should receive aspirin 75mg to 100mg indefinitely along with PGY12 inhibitor for at least 12 months.

PGY12 inhibitors include 3 agents namely, clopidogrel, prasugrel and ticagrelor. Guidelines recommend preference of ticagrelor and prasugrel over clopidogrel based on evidence available from large scale trials. Prasugrel would not be considered in patients with history of stroke or TIA. Continuation of DAPT can be considered in patients undergoing stent implantation if ischemic risk > bleeding risk.

Clinical Conundrum:

Balancing ischemic risk with bleeding risk with the use of triple therapy is the major issue faced by the physicians in treating patients with AF and ACS undergoing PCI due to increased bleeding risk.

Evaluation of Ischemic and Bleeding Risk:

Patient specific risk factors should be evaluated to identify if triple therapy is warranted. Use of risk scores such as HAS-BLED bleeding risk score, CHA_2DS_2-VASc score and DAPT score will help identify patients in whom ischemic risk > bleeding risk.

Evidence from Trials: Dual Therapy is Safer

Study	Bleeding Dual Therapy (%)	Bleeding Triple Therapy (%)	Thrombotic Events Dual Therapy (%)	Thrombotic Events Triple Therapy (%)
WOEST	19.5	44.9	11.1	17.6
PIONEER	16.8	26.7	6.5	6.0
RE-DUAL	20.2	25.7	11.8	12.8
AUGUSTUS	13.8	18.7	15.7	13.9

Consensus Recommendation Based on Evidence:

As per 2019 AHA/ACC/HRS Focused update on AF, clopidogrel is preferred over prasugrel in triple therapy. DOAC* is also preferred over warfarin except in patients with moderate to severe mitral stenosis or mechanical heart valve

Default: Clopidogrel for 12 months + DOAC

High ischemic risk: Aspirin for 1 month + Clopidogrel or Ticagrelor for 12 months + DOAC

High bleeding risk: Clopidogrel for 6 months + DOAC

*DOAC: Direct Oral Anticoagulants

Mind the Gap: Filling in the Holes of All Things Pain

Presenters: Lee Kral, PharmD, CPE; Tanya Uritsky, PharmD, BCPS, CPE; Maria Foy, PharmD, BCPS, CPE

Summarized by: Marina Pittiglio, PharmD
PGY-2 Critical Care Pharmacy Resident
Community Medical Center

Presenters during this CE presentation at 2019 ASHP Midyear discussed multiple pain management topics regarding opioid conversions and selection of analgesic agents for complex pain disease state management.

Long Term Opioids Adverse Effects

- Immunosuppression (morphine and fentanyl)
- Hormonal changes
- Increased risk of fracture
- Constipation complications
- Risk of overdose
- Respiratory depression

Buprenorphine Dosing- Transmucosal Film

- MEDD <30 mg: 75 mcg once daily or every 12 hours
- MEDD 30-89 mg: 150 mcg every 12 hours
- MEDD 90-160 mg: 300 mcg every 12 hours
- MEDD >160 mg: buprenorphine may not provide adequate analgesia- consider alternative agent

****MEDD = morphine equivalent daily dose**

Opioids, Adjuvants and Conversions:

There is more than one fentanyl conversion ratio out there with the traditional ratio of fentanyl to morphine being 1:2. However, recent publications have been using a ratio of 1:2.4. When performing fentanyl conversions it is important to consider your patient population and round down if necessary. Atypical antiepileptic agents are not generally recommended as first line, but have been shown to have a role in less common neuropathic pain.

Medication	Daily Dose	Side Effects
Carbamazepine	100 mg BID, titrate by 100-200 mg/week; max 400 mg TID	Dizziness, blurred vision, hepatotoxicity, rash, hyponatremia
Oxcarbazepine	75 mg BID, titrate by 75 mg-150 mg/week; max 600 mg BID	Dizziness, blurred vision, hyponatremia
Lamotrigine	25 mg BID, titrate by 25 mg/week; max 200 mg BID	Rash
Baclofen	10 mg TID, double to 20 mg TID; max 20 mg QID	Sedation, weakness

When selecting initial muscle relaxant to start in patients, it is important to consider the mechanism of action and sedation potential of each medication. It is also important to evaluate their efficacy in regards to clinical trials. Baclofen has the lowest sedation potential, tizanidine and cyclobenzaprine are both highly sedative and carisoprodol is highly addictive and sedating. NSAID selection is based on GI, cardiac and renal status. Buprenorphine is an excellent analgesic at low doses but can be difficult to convert to in practice (see dosing conversion to the left).

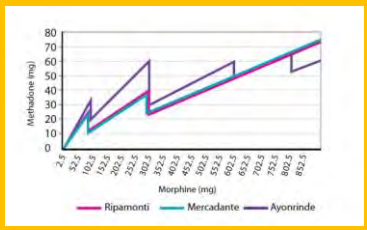
Unique Disease States with Complex Pain Management:

Complex Regional Pain Syndrome (CRPS) is a pain condition with autonomic and inflammatory changes resulting in severe intractable pain. For diagnosis of CRPS you need at least one additional symptom in 3 out of 4 categories (sensory, vasomotor, motor/trophic, and sudomotor/edema). Ketamine despite lack of evidence of benefit for many pain conditions has moderate evidence of efficacy in CRPS. Fibromyalgia is the presence of widespread chronic pain with unknown causality. Utilization of biopsychosocial model with focus on reducing fear of pain and increase understanding of how chronic pain works can be an effective pain reduction strategy for fibromyalgia patients. Sickle cell disease is an inherited disorder that causes red blood cells to develop into a sickle shape and these patients can have acute pain crisis (acute vaso-occlusive crisis) that requires urgent acute pain management. IV opioids are recommended to be used for sickle cell crisis pain when unrelieved with oral analgesics and NSAIDs can be considered in those with good renal function.

Treating Chronic Non-Cancer Pain in an Era of Guidelines and Fatal Drug Interactions

Presenters: Ernest Dole, Pharm.D., FASHP; Jeffrey Fundin, Pharm.D., DAIPM, FASHP, FCCP, FFSMB
Summarized by: Drew Valentino, PharmD, PGY-I Pharmacy Resident,
Robert Wood Johnson University Hospital, New Brunswick

Dr. Dole and Dr. Fundin presented a CE lecture at ASHP Midyear 2019 in Las Vegas where they discussed the consequences and impacts of the updated CDC guidelines and common flaws pitfalls in calculating MMEs (morphine milligram equivalency).



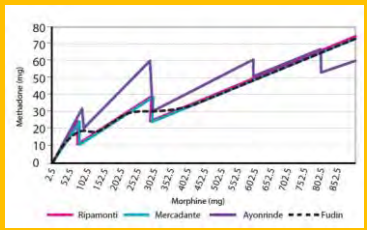


Figure 1 (Top) - showing methadone (mg) versus MMEs
Figure 2 (Bottom) - showing the Fundin equation applied

Impact of CDC Guidelines:

When the updated pain management guidelines were published by the CDC in 2016, they suggested a maximum of 90 morphine milligram equivalent (MMEs) per day for patients. Prescribers began tapering chronic pain patients from pain management regimens that they had been otherwise stable on for years, resulting in five to seven million patients experiencing pain due to the forced reduction of pain medications. The presenters argue that the CDC is suggesting a "one dose fits all" approach to chronic nonmalignant pain management and that because of their guidelines, there is uncalled for stigma associated with exceeding 90 MMEs per day. The recommended maximum morphine equivalent doses have fluctuated over the years and vary between organization and state. The CDC is now in the process of establishing a new task force to clarify its recommendations on opioid prescribing in response to criticisms from both prescribers and patients following criticism from prescribers and patients alike.

Flaws in Calculations for Equianalgesic Opioid Doses:

Many prescribers and pharmacists use MMEs to convert a patient between various opioids. The presenters reinforced that these conversions are only valid for the analgesic effects of the medications, but do not speak to the potential for other side effects such as sedation or respiratory depression. Carefully pain stewardship must be utilized when switching between opioids that have active metabolites or are metabolized by enzymes known to exhibit pharmacogenetics variance, as the MMEs will not hold true for these patients. Additionally, the conversions are widely regarded as inaccurate when converting to or from fentanyl or methadone.

Methadone conversions are especially precarious; 33% of all prescription opioids deaths are attributable to methadone, yet they only comprise 2% of all opioid prescriptions, potentially capturing the difficulty in stabilization of methadone treatments. This is largely due to the lack of accepted conversions for methadone equivalence. Plotting the proposed methadone dose by MME using several various formulas (Figure 1) reveals large variation in the methadone dose prescribed. For example, a patient receiving 302.5 MME/day should receive between 25 – 60 mg methadone/day; but a patient receiving 310 MME/day should receive 25 – 30 mg methadone/day. This shows the wild, counterintuitive nature of these equations. Fundin et al has developed their own formula that fits a line to these existing models to smooth out the curve expressing the recommended dose of methadone (Figure 2). The presenters propose that this new formula better captures the true mg equivalence of methadone to MMEs.

Ethical Prescribing in the Era of Expensive Medications and Drug Shortage

Presenters: Genevieve Hayes, PharmD, MS Pharm, BCPS; Yoram Unguru, MD, MS, MA; Andrew Shuman, MD, FACS

Summarized by: Lalitha Sukumar, PharmD, PGY-I Pharmacy Resident, Clara Maass Medical Center

Drug shortages have become an ongoing public health crisis. There are very few therapeutic alternatives to drugs in short supply which makes it difficult for health care professionals to provide the best care to patients. In review of more than 6,000 hospitals across the U.S., it is estimated that drug shortages are costing facilities at least $359 million per year in additional annual labor expense alone. The panelists in this CE were from various institutions across the country and they provided their insight on strategies that could be employed to optimize the supply chain for essential medications and approaches for allocating limited medication supplies resulting from a manufacturing shortage.

Causes of Drug Shortages:

- Disruption in supply chain availability of actively marketed drugs
- Manufacturing and quality issues
- Natural disasters
- Product discontinuation
- Unforeseen increase in clinical demand
- Changes in clinical practice guidelines

Drug Shortage Resources:

- Wholesaler
- ASHP drug shortage website
- Manufacturer
- FDA website
- Pharmacy professional organization list server/forum

Mitigation Strategy Framework:

- Verify whether ASHP or FDA list the drug as shortage supply and obtain updates on the duration
- Implement one or more task forces or committees dedicated to addressing drug shortages and allocations
- Increase stock of medications that are anticipated to be limited in supply
- Anticipate drug needs for current and expectant patients and restrict use to populations deemed most in need
- If the preferred drug brand or strength is unavailable then contact manufacturers directly for alternate product sizes
- Borrow and share drugs with neighboring institutions
- Alternate dosing if possible to less frequent dosing
- If feasible, compound drug on own or acquire from a commercial compounding pharmacy
- Acquire drug via FDA from a non-US supplier
- If stability and sterility profile supports doing so, consider extending drug usage beyond the beyond use date

In regards to the management of high-cost medications, a systematic review process should be created. The medication should be restricted for approval due to cost, availability, stewardship, etc. It should be assessed for clinical effectiveness through randomized controlled trials. There should be a committee dedicated to determining if there are alternative therapies available. The timing and duration of the treatment should also be reviewed to determine if it could be deferred to the outpatient setting.

The number of new drug shortages in the U.S. continues to rise, and pharmacy teams within hospitals and health systems must deal with the impact of these shortages on a daily basis. It is imperative that we have a plan prepared in order to ethically provide a fair distribution of resources to our patients.