Missouri Society of Health-System Pharmacists Newsletter January/February 2017

Regulatory Update

Bert McClary

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Board of Pharmacy

The following topics were among those discussed during the January 18 meeting:

- A brief presentation by MSHP regarding a possible legislative proposal to expand pharmacist authority to prescribe.
- A new sterile compounding inspection form was approved.
- An Executive Order from Gov. Greitens requires all proposed rules to be returned to the agencies for resubmission and places restrictions on new rules. BOP proposed rules affected include medication therapy services (MTS), compounding and technicians.
- The format for a joint Patient Safety Conference will be discussed with other participating agencies.
- A DEA Diversion Conference will be scheduled soon for Kansas City.
- Language for the Class B Hospital Pharmacy Guidance document was reviewed.
- Mandatory rule review included recommendations for further review of Pharmacy Standards of Operation relative to remote supervision of technicians and Automated Dispensing Systems relative to health system physician clinic stock.

BOP Hospital Advisory Committee

The HAC holds public meetings, but attendance at telephone conferences is limited. Contact BOP for attendance information. November and January telephone conference meetings included discussion of:

- Class B rule topics relative to emergency department dispensing by pharmacists, Class B facility standards and pharmacy access by non-pharmacists.
- Class B Guidance document topics relative to labeling requirements, MTS protocol order require
- ments and MTS protocol application in licensed hospital premises clinics.
- MTS rules relative to their application in hospitals and health systems.
- Distribution to LTCFs owned/operated by hospitals or health systems from hospital pharmacies.

Planned future agenda topics include

- Complete review of current MTS rules relative to hospitals and health systems.
- Review of the draft concept language for a Class N (Health Care Facility) Automated Dispensing System rule.
- Discussion of technician education, training, competency and roles.

February/March MSHP Member Checklist:

- ☐ Register for the MSHP & ICHP Annual Conference: March 31-April 1 2017 at The Gateway Center
- ☐ Register for an Evening at Ballpark Village: Friday March, 31st 2017
- ☐ Vote on MSHP ballots for future MSHP Officers
- ☐ Submit an article for the upcoming MSHP newsletter, Deadline: March 13th, Topic: Specialty Pharmacy
- ☐ Pharmacy Directors or Staff: Register for the Reverse Exhibit at the MSHP Annual Conference

BOP Technician Working Group

The Technician Working Group has met three times in 6 months. During the first two meetings extensive discussion included current rules and practice activities, and recommendations for new categories of registration. During the last meeting on January 27, discussion centered on recommendations for a general definition, education and training requirements and specific activities of each category.

The recommended categories are:

- Registered Pharmacy Support Staff
- Registered Pharmacy Technician
- Registered Advanced Pharmacy Technician

Category definitions are based on general statements, avoiding specific activities in the statutory language and allowing the Board to determine specific activities by rule. The advanced technician will generally be based on advanced technical skills required; levels of risk, independence and responsibility; and participation in clinical support and direct patient care activities.

Education and training is proposed to include requirements for core subject content, didactic and experiential components, minimum hours, and competency testing.

Certification by certain nationally recognized providers is proposed for the advanced technician, with special considerations for nuclear pharmacy technicians.

MSHP Public Policy Committee

The Public Policy committee meets by telephone conference the first Thursday of each month at 4:00 pm. Contact Chair Brian O'Neil at bconeil@cmh.edu for agenda notices.

Open discussion recently has included:

- Prescription monitoring programs and other controlled substances security and recordkeeping issues.
- Review of MSHP Strategic Plan relative to the Public Policy Committee
- MTS statute and rules. The committee discussed the possible legislative proposal regarding MTS prescribing authority and recommended a joint effort with the Practice Advancement Initiative.
- Technician education and training
- HB 332 Vaccine product restrictions

MSHP Practice Advancement Initiative

During November and December several MSHP members discussed the possibility of introducing legislation to improve pharmacist MTS activities. The Public Policy Committee and the Collaborative Practice Subcommittee of the PAI jointly held an invited forum on January 3 at UMKC to formulate a plan of action. Participants were primarily representatives or members of MSHP, the Missouri Pharmacy Association (MPA), UMKC, StLCOP and BOP.

The current pharmacy practice act allows pharmacists to provide MTS through physician/pharmacist protocols, and joint rules between BOP and the Board of Healing Arts interpret this allowance to include modification of medication therapy.

A notable section in the law states that pharmacists shall not "independently prescribe pharmaceuticals." This phrase inhibits pharmacists in the provision of efficient patient care by prohibiting the authority to sign a written prescription or to modify controlled substances medications.

It is necessary to provide the authority to prescribe drugs and controlled substances in the pharmacy practice act, and in turn provide prescriptive authority for controlled substances in the state controlled substances act. State controlled substances authority is required for a mid-level practitioner to obtain a federal DEA controlled substances registration.

The statute also requires a medical prescription order for a specific patient from the protocol physician for a pharmacist to provide MTS. This requirement also inhibits the efficient initiation of pre-approved protocols

for certain patient populations by adding an unnecessary step.

The group proposed tentative language that removes the independent prescribing statement in favor of a statement that allows the pharmacist to prescribe drugs and controlled substances. The proposed language also removes the requirement of the prescription order to initiate a protocol.

The group will continue to refine the language and develop support from other health care organizations, individuals, and legislators. The group will also monitor and support various federal and state provider status initiatives, including the re-introduced federal Congressional bills and programs through MoHealthNet (Medicaid).

The revised language will not only allow a pharmacist to practice at the top of his/her license, but also to practice at the top of his/her competency.

An Evening at Ballpark Village

When: Friday, March 31, 2017

What is included?

- Bus ride to and from the event (Seating is limited. Please register by Friday, March 24th to reserve your seat on the bus)
- Heavy hors d' oeuvres
- Beverage
- Music
- Giveaways
- Fun

Cost: *Pharmacists*- $75, *Pharmacy Technician/Resident/Student*- $35

Wear your favorite team Jersey

Not a baseball fan? Wear any team jersey or casual attire

Call Jim Andrews at 314-416-2246 for questions
Register by completing flyer sent by MSHP through email

A special thank you to PharMEDium for sponsoring this fun even in support of the ICHP Pharmacy Action Fund (PAC) and MSHP R&E foundation.

Affiliate Chapter News and Events

Saint Louis Society of Health-System Pharmacists (STLSHP)

Upcoming Events:
February 23rd: Sponsored Program

StLSHP is currently seeking nominations for the positions of president-elect and treasurer! Both of these positions are StLSHP executive board members, serving from July to June. Keep a look out for a voting ballot in the near future.

Membership Spotlight:
Congratulations to Katie Tellor on her recent publication in Pharmacotherapy titled Comparison of the Safety and Effectiveness of Apixaban versus Warfarin in Patients with Severe Renal Impairment. Preliminary results of this analysis were presented at the KCHP/MSHP 2016 Annual Meeting in Kansas City, MO.

Congratulations to Emily Owen, Gabrielle Gibson and Hannah Pope on presenting their research abstracts at the Society of Critical Care Medicine Annual Congress 2017.

President: Mike Daly, PharmD, MSCI, BCPS (Michael.Daly@ssmsluh.com)

Mid-Missouri Society of Health-System Pharmacists (MMSHP)

Upcoming Events:
February 23rd: Sponsored Program
Topic: CORE (C1 esterase inhibitor ON-demand REplacement) Therapy for HAE
Speaker: Adrian M. Casillas, MD
Location: Umbria Rustic Italian
Time: 6:30 PM

March 9th: Sponsored Program

April: Sponsored Program, date TBD

May/June: Pharmacy resident CE programs, dates TBD

President: Jordan Anderson, PharmD, BCPS, BCPPS (AndersonJord@health.missouri.edu)

Affiliate Chapter News and Events

Greater Kansas City Society of Health-System Pharmacists (GKCSHP)

Upcoming Events:

Mark your Calendar for ***February 16th, March 16th, April 20th, May 18th*****:** Location and Topics TBA

Don't forget about 2017 GKCSHP meetings starting in February. All meetings will be scheduled the third Thursday of every month. Stay Tuned for topics for the presentations.

February Program:
Topic/Speaker: TBD
Location: Lidia's
Time: 6:30 PM

March Program:
Topic: Kcentra
Speaker: Morey Blinder
Location: Nara
Time: 6:30 PM

Annual GKCSHP Awards:
Pharmacist of the Year: Andrew Smith- UMKC/Truman Medical Center
Student of the Year: Elizabeth Ronson- UMKC Class of 2017
Technician of the Year: Ladonna Baylis- Truman Medical Center

Congratulations to all the Award Winners!

Member Spotlight:

Congratulations to Erin Pender, Kerra Cissne, and Allegra Durant on presenting their research abstract as a Research Snapshot Presentation at the Society of Critical Care Medicine Annual Congress 2017. Their research title is A Nursing Survey of Protocol-Based Pain, Sedation and Delirium Management in an Intensive Care unit.

President: Erin Pender, PharmD, BCPS, BCCCP (erin.pender@tmcmed.org)

Featured Articles

Alprazolam-Free: What Now?

By Joshua Holland, PharmD, BCPP
Masters in Mental Health Counseling Candidate, 2017

Recently, more attention has been given to the opioid epidemic within the United States and the role that the healthcare system has played in the perpetuation of this problem. The CDC recently came out with evidence-based guidelines to help prescribers utilize this category of medications in the most effective and safest way possible.[1] It is hard to refute the effectiveness of an opioid for treating pain, but we are finally able to put numbers to the potentially devastating negative effects of these medications, especially in regards to addiction and overdose.[1] In my opinion, the situation is similar for benzodiazepines and the treatment of anxiety. Like pain, anxiety is at times a valuable mechanism for survival; however, if it is too intense or prolonged, it can cause deterioration of an individual's physical and mental health.

One of the problems with treating and managing pain and anxiety is dealing with the subjectivity of both. From my experience, it has been difficult to find a treatment balance between providing adequate care through medication (benefits) without exposing the individual to harmful effects (risks/side effects). It can be hard to determine sometimes if a benzodiazepine will be helpful or harmful. However, amongst the benzodiazepines, alprazolam has proven to be more dangerous and likely to be abused. [2,3,4] Alprazolam also has a kinetic profile more conducive to being abused, with a quick onset and short duration of action (Table 1). Anecdotally, I have found that patients will request it more frequently, and I have been told that it has a higher street value than the other benzodiazepines. For these reasons, the

CoxHealth inpatient psychiatric facility went alprazolam-free in May 2015. Now other clinics in Springfield, Missouri have also taken this same course of action.

Because of these decisions, I have had patients and physicians ask me to explain the rationale behind going alprazolam-free and what can be done moving forward. I provide them with two possible courses of action: patients can be switched to a different benzodiazepine (Table 1) or they can take this opportunity to try and get off of benzodiazepines completely. This transition can be a tough and frustrating task as patients may have to deal with physical and psychological dependence to these medications. Psychological dependence can be harder to spot than physical dependence (withdrawals). Psychological dependence happens when the patient has identified the use of the medication with relief of symptoms so much so that it becomes the primary or only coping skill. Patients with psychological dependence will display increased anxiety and agitation upon even the possibility of their medication being reduced or discontinued. They may also say things like, "I need my alprazolam or otherwise I can't handle my anxiety" or "I will go crazy if I don't have my alprazolam." The presence of

dependence can make the process more complicated, but with patience and a focus on collaboration, pharmacists can help patients achieve equal if not better anxiety management.

Below are some of the topic points that I focus on when talking with patients and healthcare professionals about benzodiazepines. These points will also be helpful in working with patients who are physically or psychologically dependent.

Listen to concerns.

It always helps to listen first. This not only works on building good rapport with the patient, but it helps save time by truly being able to focus on what the patient is concerned about. Patients may also identify areas or problems in their personal life that can be addressed such as financial concerns, relationship issues, etc. It helps sometimes to identify anxieties that can be dealt with through problem solving rather than with a medication. Listening will also help the pharmacist identify possible opportunities where motivational interviewing can be applied to help encourage the patient towards self-identified goals.

Promote safety.

Sometimes patients may feel like they are being judged or punished when medications that are controlled substances are being denied, decreased, or changed. I remind patients that most decisions made in regards to medications have to do with safety and efficacy, and safety is more important than efficacy. For a medication to be prescribed, the physician needs to be able to trust that a patient is able to be safe with the medication. If the patient has displayed behavior that shows that they cannot be trusted, the medication may not be prescribed even if it is effective. This puts the responsibility back on the patient and away from others in regards to their behavior. I remind patients that trust takes time and that trust is more likely to occur with a physician that they have worked with for years. I stress the importance of finding one physician and one pharmacy that they like and working almost exclusively with them if possible.

Another important area of safety that I address with patients is the fact that benzodiazepines work on the same chemical in the brain as alcohol (GABA).[5] This class of medications works by increasing the phasic firing of GABA-A receptors; whereas, alcohol works by increasing the tonic firing of the GABA-A receptor.[5] Individuals who struggle with alcoholism may not be good candidates to be on benzodiazepines. Also, individuals who have struggled with alcoholism in the past need to be warned that these medications may also be a concern for abuse in the same way for them as alcohol. Many individuals use alcohol to self-medicate for anxiety and to "numb" their emotions. I have found it to be helpful to understand the neurobiology involved with addiction, and I have included an article in the references section that provides a good summary on this topic.[6]

Educate about alternative treatments.

I find that most concerns come from a lack of knowledge about benzodiazepines as well as treatment for anxiety. Benzodiazepines are typically meant to be used for only 6 months or

less when prescribed for anxiety disorders.[7] This is to help decrease the anxiety level enough to develop alternative coping skills or for maintenance medications to work fully. As pharmacists, it is my belief that it is just as much our job to educate patients about lifestyle modifications as it is to educate them about medications, especially if the lifestyle modifications are evidence based.

With the advancement of neuroimaging, scientists have been able to measure and document the benefits of some non-pharmacological methods to manage anxiety. Meditation, mindfulness, deep breathing, prayer, etc. have been proven to cause changes to the brain that decrease anxiety and increase mental wellness.[8,9] Exercise, yoga, and stretching have also been found to be beneficial for both physical and mental health. For individuals with the diagnosis of PTSD, benzodiazepines are actually contraindicated due to a higher likelihood of abuse, and the fact that they interfere with the individual's ability to reprocess the event(s).[7,10] Therapies like eye movement desensitization and reprocessing (EMDR) and exposure therapy have been found to be proven evidence-based treatments with positive outcomes.[10] The article in the reference section on EMDR goes into the neurobiology of how and why EMDR works if interested in learning more about this treatment.[10]

Benzodiazepine Equivalency Chart*		
Drug	**Duration of Action**	**Approx. dose equiv. (mg)**
Alprazolam	Short	0.5 to 1
Chlordiazepoxide	Long	25
Clonazepam	Long	0.5 to 1
Clorazepate	Long	15
Diazepam	Long	10
Lorazepam	Intermediate	1 to 2
Temazepam	Intermediate	20

Patients should also be counseled that antidepressants such as SSRIs, SNRIs, and TCAs are 1st line options for treatment of anxiety disorders.[5,7] Serotonin has regulating effects on the amygdala that help decrease the frequency and intensity of anxiety over time.[5] However, they will take at least 2 to 6 weeks to work fully as the brain needs time to adjust, and the improvement will be slower than with benzodiazepines.[5,7] These are important counseling points to discuss with patients as it helps the patient have realistic expectations of when they can start to see some improvement in anxiety symptoms.

Table 1

*Compiled from 2 citations.[11,12]

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Addressing Substance Use and Recovery in Pharmacy Practice

Misty L. Gonzalez, PharmD, BCPP

A not uncommon, but infrequently discussed issue affecting society is addressing the impaired healthcare professional. The incidence of substance use disorders within the healthcare field is believed to be higher than that of the general population (Jungnickel, 2010). Healthcare professionals, particularly pharmacists, physicians, and nurses are vulnerable to developing substance use disorders.

Table 1. Signs and Symptoms of Substance Use Disorders in Pharmacists

- Changes in mood or personality
- Frequent absences, illnesses, tardiness
- Interest in working with narcotics
- Frequent or extended absences from workstation
- Increased medication errors
- Unkempt appearance or hygiene
- Decrease in work performance
- Excessive ordering of narcotics
- Over-reactions to critiques

According to the 2003 National Institute on Drug Abuse (NIDA) report, 8% to 12% of healthcare professionals had chemical dependencies (Young, 2003). As many as 40% of practicing pharmacists have reported non-medical use of prescribed drugs (Dabney, 2001) (McAuliffe, 1987) (Kenna, 2003). A study by McAuliffe, et al., indicated two thirds of pharmacy students surveyed reported lifetime use of a controlled

substance without a prescription and nearly half of students surveyed reported use a controlled substance without a prescription within the past year (McAuliffe, 1987).

Many pharmacists with substance use disorders function well in their daily practices, but they may exhibit some characteristic features of impairment. These signs and symptoms of substance use disorders are outlined in Table 1 (Terrie, 2006; ISMP, March 2016). Impaired pharmacists may be discovered during site inspections through their state's board of pharmacy, through workplace investigation when reports indicate possible drug diversion, or by law enforcement when engaging in illegal activity related to substance use (Terrie, 2006).

When a pharmacist has been identified as having a substance use disorder, they need treatment referral to achieve recovery. It is optimal for individuals to seek help before legal and professional licensure ramifications develop. Long-term follow up to reduce relapse is necessary. These individuals should not practice pharmacy until recovery from the substance use disorder is achieved (Milenkovich, 2013). Once a pharmacist demonstrates a commitment to a substance-free lifestyle, return to pharmacy practice is possible.

Sustained recovery from substance use disorders is as high as 85% for pharmacists (Terrie, 2006), which the highest among healthcare professionals. Recognizing the signs and symptoms of a substance use problem and acknowledgement that a substance use problem exists are crucial steps in the road to recovery. Predisposing factors for developing a substance use disorders include early age of first use, male gender, family history, access to prescription drugs, and a stressful work environment (Al-Shatnawi, 2016). Typical manifestations of a stressful work environment include, but are not limited to, long work days, levels of increased responsibility, skipped meals, and skipped breaks (Al-Shatnawi, 2016).

Access to narcotic drugs alone is not sufficient to account for potential substance use. Access to drugs creates the opportunity for diversion, but it is the combination with other risks that increases the vulnerability of the profession. Many pharmacists who have a substance use disorder fear that if their behavior is discovered they will be punished. Because of this many are discouraged from Seeking help for their disorder (Merlo, 2012). Pharmacists would benefit from education about confidential supportive resources available, for themselves, or to help an affected colleague.

There are several resources to support pharmacists in overcoming substance use disorders. Recovery is a realistic goal with proper intervention and treatment. Many state boards of pharmacy recognize the significant risks of pharmacists working while impaired, and have established Pharmacist Recovery Networks (PRN). Pharmacist Recovery Networks (PRNs) are a confidential, non-punitive alternative to formal disciplinary action that are available in many states. PRNs assist in recognition and treatment

substance use disorders for pharmacists, pharmacy students, pharmacy technicians, and other healthcare professionals. Participants in these programs can expect confidentiality, evaluation by an addiction medicine specialist, support in locating treatment centers, referral to Alcoholics Anonymous (AA) or Narcotics Anonymous (NA) meetings specific for healthcare professionals, and rehabilitation that continues after treatment to help the pharmacist re-enter the profession, when possible.

A total of 42 of 50 states currently have an active PRN program in place to assist pharmacists in recovery. Most PRNs consist of a multidisciplinary treatment team trained in substance use disorders who can provide legal and treatment referrals, monitor recovery, and offer various means of support. State PRN programs can be located by going to www.usaprn.org and clicking on the state PRN information tab and then clicking on your corresponding state. Participants may be self-referred to the program, referred by a colleague, or referred by the board of pharmacy. PRNs may advise on professional licensure issues including voluntary relinquishment of the pharmacy license until the pharmacist ready to re-enter pharmacy practice. Common PRN services are described in Table 2. Connecticut, Delaware, Georgia, Iowa, Maryland, Nevada, New York, North Carolina, Oklahoma, South Dakota, Tennessee, Utah, and Virginia all have PRNs that are free standing from the state boards of pharmacy. Massachusetts and Texas both have PRNs that are coordinated through the state board of pharmacy. Hawaii, Missouri, Montana, Oregon, and Vermont do not currently have active PRNs. If one is fortunate be licensed in one of the many states with an active PRN program, this may help serve as a resource to facilitate recovery.

Each state has individual procedures for addressing impairment. When a pharmacist is discovered to have a substance use issue by a regulatory agency, they are often not allowed to practice pharmacy in any state and may face licensure suspension or revocation. Self-reporting to PRN or similar treatment program helps pharmacists address the disease of addiction and may prevent disciplinary action through early intervention. There are a number of additional addiction and recovery resources available to pharmacists and other health professionals, which are listed in Table 3. For many, the most difficult step is overcoming professional shame, and seeking help (Milenkovich, 2013).

Many pharmacists may be placed in uncomfortable situations in which they suspect a colleague is practicing while impaired. These individuals carry an ethical requirement to act on these suspicions and properly report the concern. A person that is practicing while impaired might have a personality change, mood swings, frequent absences from work, long disappearances from the work area, increases in

Table 2. Common PRN Assistance Services

- 24 hour toll free hotline
- Assist in evaluation upon initial referral to program
- Clinical case management by a case manager
- Community outreach programs
- Documentation of compliance with agreement
- Educational programs on the topic of substance use to the individual
- Educational programs on the topic of substance use to the public
- Group Counseling
- Individual Counseling
- Monitoring during profession reentry
- Networking opportunities with colleagues in recovery
- Preparation of reports to the State Board of Pharmacy
- Support reentry to the profession
- Treatment referral
- Urine drug screening

medication errors, and trouble concentrating. It is equally important for a pharmacist to able to recognize what to do if he or she has a substance use disorder. The most important step is realizing that a problem exists. This can be done by examining his or her own family history, current stress level, any changes in work habits or mood. If it is determined that these changes or factors have put the individual at risk or if there already is a problem, it is important to contact a manager, treatment provider, or PRN.

An impaired pharmacist may be able to retain his or her license through a PRN program once stable recovery is achieved through the services offered (Merlo, 2012). Conditions for returning to pharmacy practice may include at least 6 months in individual/group treatment program, attending daily AA/NA recovery meetings for 3 months or as determined by treatment provider, submitting to random drug screens, finding a recovery sponsor, abstinence substances of abuse, and providing progress reports to employer or board of pharmacy (Cross, 2015). Impaired pharmacists need long-term care and follow-up support to reduce the likelihood of relapse. One must acknowledge addiction as a chronic disease, which requires continued abstinence and a comprehensive aftercare plan.

Nationally there remains continued need for development of, and access to substance-use evaluation, referral programs, and interventions to facilitate recovery for healthcare professionals. Emphasis should be placed on education, prevention, and early detection to address behaviors that may jeopardize the quality of care given to patients (ISMP, March 2016). There is room for growth in systems for preventing and detecting drug diversion and available workplace support for individuals battling prescription drug dependency. Employers should expect diversion, and take necessary precautions to prevent it (ISMP, March 2016). All healthcare workers should be educated to recognize potential signs and symptoms of impairment in coworkers. Concerns of diversion should be reported through a confidential process. Employees and employers need education on recovery resources to refer a colleague or self-refer if impairment is possible. It is important to take care of ourselves by addressing impairment

before taking on the healthcare responsibility in which the pubic entrusts in us.

Table 3. Pharmacist Addiction & Recovery Resources

- USA Pharmacist Recovery Network (PRN), www.usaprn.org
- International Doctors in Alcoholics Anonymous, www.idaa.org
- American Pharmacists Association Pain, Palliative Care and Addiction SIG, www.pharmacist.com/pain-palliative-care-and-addiction-sig-1
- Narcotics Anonymous, www.na.org
- Alcoholics Anonymous, www.aa.org
- Substance Abuse and Mental Health Services Administration, www.samhsa.gov
- American Society of Addiction Medicine, www.asam.org
- National Institute on Drug Abuse,

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January/February 2017

Differentiating Long-Acting Injectable Antipsychotics

Zachary Righter, PharmD Candidate

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Note: Tables included in separate appendix

History and Background

In the 1950's, the discovery of antipsychotic medications completely changed the field of psychiatry and the treatment of psychiatric disorders. The revolution of antipsychotic medications brought about a significant improvement in care and quality of life for many individuals. In the mid 1980's, the formulation of long-acting injectable (LAI) antipsychotics have once again impacted the management of psychiatric conditions. To date, two first-generation antipsychotics (haloperidol and fluphenazine) and four second-generation antipsychotics (aripiprazole, olanzapine, paliperidone, and risperidone) all have LAI formulations commercially available.

Antipsychotic medications have FDA approval for the treatment of schizophrenia, schizoaffective disorder, and bipolar affective disorder (BPAD). LAI antipsychotics have shown benefit in these disease states and may be preferred over oral antipsychotics in some populations due to convenience. The LAI antipsychotics have less variability in peak/trough levels, which can improve tolerability. Oral antipsychotics are dosed at least once per day, and sometimes may be dosed even more frequently. In many individuals with thought process disorders, adherence is difficult, so the utilization of LAIs can help. Specifically, LAI antipsychotics can relieve the burden of taking a daily medication and may improve medication adherence rates.[1] LAIs can be dosed every 2-6 weeks, or even up to every 12 weeks depending on the medication. Package inserts contain instructions for missed and/or late doses for each specific medication.

When it comes to efficacy and tolerability of LAI antipsychotics compared to oral antipsychotics, the verdict from clinical studies still remains unclear. Some clinical studies have found that LAI antipsychotics had reduced hospitalization and re-hospitalization rates compared to oral antipsychotics.[1,2] However, one large meta-analysis found that LAI antipsychotics have shown no benefit over oral antipsychotics, in terms of safety and efficacy.[3] For the time being, it remains that LAI antipsychotics are non-inferior to oral antipsychotics in terms of safety and efficacy and may be preferred by many people.

Choosing an LAI

LAI antipsychotic medications come with a substantial cost to consider, with a range of $100-$8,000.[4] Table 1 describes estimations of the AWP per vial for each of the medications, according to Red Book Online.[4] One medication vial, depending on each specific medication, may provide one to three months of treatment for the person. Online resources such as www.needymeds.org , www.rxassist.org , and www.goodrx.com may be utilized as search engines to help find manufacturer sponsored patient assistance programs and the lowest cash price for a medication within a certain area. Additionally, it is recommended to check with each individual's insurance company, if applicable, to find out which, if any, LAI antipsychotic medications would be covered.

Choosing between the different LAI antipsychotics for a person depends on the individual's propensity for specific side effects, as the efficacy between LAI antipsychotics is very

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References:

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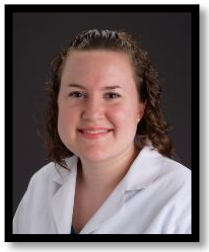
Missouri Society of Health-System Pharmacists Newsletter January/February 2017

MSHP Member Spotlight



Jordan Anderson
PharmD, BCPS, BCPP

Jordan Anderson is a Pediatrics Clinical Pharmacy Specialist at University of Missouri Health Center (UMHC). She currently practices in the pediatric intensive care unit and general pediatrics. In addition, at UMHC she serves as the PGY-1 Pharmacy Residency Program Coordinator. Jordan attended pharmacy school at the UMKC Satellite in Columbia and then did her PGY-1 Pharmacy Residency and PGY-2 Critical Care Pharmacy Residency at Kosair Children's Hospital in Louisville, Kentucky. She loves her job and thinks that it is very rewarding to take care of children. Pediatric pharmacy is highly challenging in regards to high variability of dosing and drug metabolism, as well as limitations with medication formulations and availability of primary literature. While it is very difficult to experience the loss of a patient, it is remarkable to witness the resilience of a these patients and the great obstacles that they overcome in acute and chronic illnesses. She currently serves as the MMSHP president and is also a member of the Pediatric Pharmacy Advocacy Group, Society of Critical Care Medicine, and American Society of Health-System Pharmacists. Outside of work she enjoys cooking and trying new restaurants with her foodie husband, traveling, reading, and spending time with her 9 month old son.

Upcoming Newsletter Topic for March/April Newsletter

Topic: Specialty Pharmacy

Submission Date: March 13th, 2017

Submit to Hannah Pope: Hannah.pope@bjc.org

Future Newsletter Topics & Deadlines:

May 8th
Pulmonary/Critical Care/Toxicology
July 10th
Pain Management
September 11th
Cardiology/Anticoagulation
November 13th
Infectious Diseases

Missouri Society of Health-System Pharmacists Newsletter January/February 2017

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Contact your fellow newsletter committee member for future 2017-2018 Membership Spotlights and Article Submissions!

Differentiating Long-Acting Injectable Antipsychotics

Zachary Righter, PharmD Candidate

Misty Gonzalez, PharmD, BCPP
Note: Tables included in separate appendix

History and Background

In the 1950's, the discovery of antipsychotic medications completely changed the field of psychiatry and the treatment of psychiatric disorders. The revolution of antipsychotic medications brought about a significant improvement in care and quality of life for many individuals. In the mid 1980's, the formulation of long-acting injectable (LAI) antipsychotics have once again impacted the management of psychiatric conditions. To date, two first-generation antipsychotics (haloperidol and fluphenazine) and four second-generation antipsychotics (aripiprazole, olanzapine, paliperidone, and risperidone) all have LAI formulations commercially available.

Antipsychotic medications have FDA approval for the treatment of schizophrenia, schizoaffective disorder, and bipolar affective disorder (BPAD). LAI antipsychotics have shown benefit in these disease states and may be preferred over oral antipsychotics in some populations due to convenience. The LAI antipsychotics have less variability in peak/trough levels, which can improve tolerability. Oral antipsychotics are dosed at least once per day, and sometimes may be dosed even more frequently. In many individuals with thought process disorders, adherence is difficult, so the utilization of LAIs can help. Specifically, LAI antipsychotics can relieve the burden of taking a daily medication and may improve medication adherence rates.[1] LAIs can be dosed every 2-6 weeks, or even up to every 12 weeks depending on the medication. Package inserts contain instructions for missed and/or late doses for each specific medication.

When it comes to efficacy and tolerability of LAI antipsychotics compared to oral antipsychotics, the verdict from clinical studies still remains unclear. Some clinical studies have found that LAI antipsychotics had reduced hospitalization and re-hospitalization rates compared to oral antipsychotics.[1,2] However, one large meta-analysis found that LAI antipsychotics have shown no benefit over oral antipsychotics, in terms of safety and efficacy.[3] For the time being, it remains that LAI antipsychotics are non-inferior to oral antipsychotics in terms of safety and efficacy and may be preferred by many people.

Choosing an LAI

LAI antipsychotic medications come with a substantial cost to consider, with a range of $100-$8,000.[4] Table 1 describes estimations of the AWP per vial for each of the medications, according to Red Book Online.[4] One medication vial, depending on each specific medication, may provide one to three months of treatment for the person. Online resources such as www.needymeds.org , www.rxassist.org , and www.goodrx.com may be utilized as search engines to help find manufacturer sponsored patient assistance programs and the lowest cash price for a medication within a certain area. Additionally, it is recommended to check with each individual's insurance company, if applicable, to find out which, if any, LAI antipsychotic medications would be covered.

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Table 1. Comparison of LAI Antipsychotics								
Brand Name	**Haldol Decanoate**	**Prolixin Decanoate**	**Risperdal Consta**	**Invega Sustenna**	**Invega Trinza**	**Abilify Maintena**	**Aristada**	**Zyprexa Relprevv**
Generic name	haloperidol decanoate	fluphenazine decanoate	risperidone microspheres	paliperidone palmitate	paliperidone palmitate	aripiprazole extended release	aripiprazole lauroxil	olanzapine pamoate
Initial dose	10-20x previous daily oral dose; max 100mg initial dose. If initial conversion >100mg, administer 100mg first then the remaining balance in 3-7 days	12.5mg-25mg	25mg Needs Renal Dosing	234mg on day 1 then 156mg 1 week later Needs renal dosing	Only to be used after Sustenna has been established as adequate treatment for at least 4 months, with last 2 doses being the same dosage strength. Dose conversion = 3.5x Sustenna Dose	400mg	441mg 662mg 882mg	10mg/day PO = 210mg Q2wk or 405mg Q4wk 15-20mg/day PO = 300mg Q2wk
Maintenance dose	Based on response	Based on response	25-50mg	39-234mg	Based on response	300-400mg	441mg 662mg 882mg	10mg/day PO = 150mg Q2wk or 300mg Q4wk 15mg/day PO = 210mg Q2wk or 405mg Q4wk 20mg/day PO = 300mg Q2wk
Oral daily dose to IM conversion	10-20x previous daily oral dose	12.5mg decanoate every 2-4 weeks ≈ 10mg oral daily	Not specified	12mg = 234mg IM 6mg = 117mg IM 3mg = 39-78mg IM	Not specified	Not specified	10mg = 441mg 15mg = 662mg 20-30mg = 882mg	See Above
Frequency	4 weeks	2-4 weeks	2 weeks	4 weeks	3 months	4 weeks	4 weeks 882mg may be given every 6 weeks	2-4 weeks
Estimated AWP/vial	~$100-200/vial	~$50-150/vial	Ranges from ~$250-1,000 depending on the dose	Ranges from ~$500-3,000 depending on the dose	Ranges from ~$3,000-8,000 depending on the dose	~$1,700 per vial	Ranges from ~$1,300-2,600 depending on the dose	Ranges from ~$700-1,400 depending on the dose
Is overlap with oral med needed?	No, but can be used	No, but can be used	Yes, for 3 weeks after first injection	No	No	Yes, for 14 days after first injection	Yes, for 3 weeks after first injection	No
# days injection can be given before or after due date	Not specified	Not specified	3 days before or 3 days after due date (interval permitted in clinical trials)	2nd initial dose of 156mg can be given 4 days before or after 1 week time point; maintenance doses may be given up to 7 days before or after monthly time point	Initiate up to 7 days before or after the monthly time point of the next scheduled Sustenna dose; Maintenance doses can be given up to 2 weeks before or 4 weeks after the 3-month time point	No sooner than 26 days after the previous dose; may need PO supplementation if > 7 days late	No sooner than 14 days after previous injection; may need PO supplementation if ≥ 14 days late	Not specified

Brand Name	Haldol Decanoate	Prolixin Decanoate	Risperdal Consta	Invega Sustenna	Invega Trinza	Abilify Maintena	Aristada	Zyprexa Relprevv
Injection site (IM)	Gluteal (preferred) or deltoid	Gluteal (preferred) or deltoid	Deltoid or gluteal	Deltoid	Deltoid or gluteal	Gluteal	Gluteal for all doses, 441mg may be given in Deltoid	Gluteal
Stability after mixing (if applicable or available)	N/A	N/A	Once mixed in suspension, must be used within 6 hours. Shake the syringe to resuspend microspheres as settling will occur if not used immediately	Shake syringe vigorously, with the syringe tip pointing up, for at least 10 seconds; use immediately.	Shake syringe vigorously, with the syringe tip pointing up, for at least 15 seconds within 5 minutes prior to administration.	Use immediately once in syringe	Tap syringe 10 times, shake syringe vigorously for 30 seconds; if not used within 10 minutes, shake again	Once mixed in suspension in vial, must be used within 24 hours. Shake vial to resuspend prior to use. Once in syringe, must be used immediately.

Modified table orignally created by Brittany Parmentier, PharmD, BCPS clinical assistant professor, University of Texas at Tyler.

Table 2. Selected Receptor Binding Affinity (K_i)

Drug	Dopamine D_2	Serotonin 5-HT_{1A}	α-Adrenergic α_1	Histamine H_1	Muscarinic M_1
Haloperidol	4	> 1,000	530	1,400	13,000
Fluphenazine	0.6	2,829	9	67	< 10,000
Risperidone	3	260	2	4	> 1,000
Paliperidone	6.6	1,030	11	34	No Data*
Aripiprazole	3	2	26	67	> 1,000
Olanzapine	14	2,700	19	3.8	8

Modified from: Challenges and solutions in developing new medications for Schizophrenia. J Clin Psychiatry. 2010 Oct;71(10):1391-9. doi: 10.4088/JCP.10064ah1yel. Erratum in: J Clin Psychiatry. 2012 Mar;73(3):401.