MEDICATION MATTERS

Pharmacy Newsletter



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News & Noteworthy:

Topping the Charts of High-Alert Medications

by Sheldon Powell, PharmD Candidate, and Jane Ching, Pharmacy Practice Resident

Medication errors can increase length of hospital stay, inpatient expenses, and rates of disability or death.¹ An error involving a high-alert medication can cause higher risk of patient harm and damaging effects. While these errors do not occur more frequently than other errors with other medications, they bear the risk of causing more harm to patients when errors occur.^{1,2}

During the recent American Society of Health-system Pharmacists Midyear Clinical Meeting in December 2016, medication safety specialist for the Institute of Safe Medication Practices (ISMP) Dr. Darryl Rich unveiled ISMP \mathfrak{F} list of the top 5 medication classes involved in medication errors in 2016.³ Data compiled from hospital medication error reports, risk assessments, and consumer and FDA reports identified opioids (n = 142 cases), antibiotics (n= 94), antipsychotics (n = 77), antithrombotics (n = 66), and insulins (n = 42) as the most frequent classes. Except antipsychotics, these medication classes mirror the classes most commonly associated with adverse events (i.e., medication errors, near misses, and adverse drug reactions) at University Hospital of Brooklyn.

(Continued on page 2)

Pharmacy & Therapeutics Committee Updates

by Jane Ching, Pharmacy Practice Resident

Meeting Months: October 2016 through January 2017

Policies and Protocols:

- (New) % nitial Immunosuppression and Postoperative Medication Guide+for periand post-operative medication orders for new adult kidney transplant recipients.
- ♦ (New) Protocol for [®] ilution of Omnipaque[®] for CT Studies+in a pilot program through the Emergency Department
- (New) Policy % harmaceutical Oversight of Drugs Acquired by Non-Pharmacy Departments+
- (New) Procalcitonin Testing Guidelines
- (New) Late Onset Neonatal Sepsis Protocol
- (Updated) % dult Initial Empiric Therapy in Sepsis Patients+for Emergency Department patients
- (Updated) Policy & Mandling Multi-dose Vials and Medications+

Formulary Changes:

- Pyrimethamine (Daraprim[®]) tablets, which now cost \$900 per tablet, will be replaced with pyrimethamine oral suspension at only \$50 for a 30-day supply.
- A new formulation of dantrolene sodium (Ryanodex[®]) will replace the older powder formulation Dantrium[®] for the emergency condition malignant hyperthermia due to greater ease and convenience of storage and preparation. More information on Ryanodex[®] is provided on page 3.
- ◆ Addition of fosfomycin (Monural[®]), an oral antibiotic
- ◆ Addition of ciprofloxacin otic (Otiprio[®]) 6% Suspension
- Removal of the enteral feeds Osmolyte 1.0[®] and Osmolyte 1.5[®] from the Food and Nutrition formulary due to lack of usage

Research Corner: Evaluation of Asymptomatic Bacteriuria Management at SUNY Downstate Medical Center

by Jane Ching, Pharmacy Practice Resident, and Stanley Moy, Antimicrobial Stewardship Pharmacist Presented at the American Society of Health Pharmacists Midyear 2016 Clinical Meeting. December 2016. Las Vegas, NV

Background: Asymptomatic bacteriuria (ASB) is defined as the presence of bacteria in the urine without signs and symptoms suggestive of a urinary tract infection (UTI).¹ Recommendations from Infectious Diseases Society of America (IDSA) guidelines state that pyuria (presence of white blood cells) in urine is not an indication for antimicrobial treatment.² While antimicrobial therapy for ASB improves short-term microbiologic outcomes, it is also associated with higher rates of resistance, adverse effects, and healthcare costs.³ A retrospective chart review was conducted at SUNY Downstate Medical Center for the purpose of assessing compliance with IDSA guideline recommendations in management of ASB.

Methods: Patients \geq 18 years old with a positive urine culture (single urine specimen that yielded an organism in quantitative counts >10⁵ cfu/mL) between January 2016 to August 2016 were included in the study. The primary outcome measured incidence of ASB treatment upon positive urinalysis (UA) and post-urine culture.

Results: Empiric antibiotic therapy was initiated in 54% of ASB patients upon positive UA, with two-thirds of patients prescribed ceftriaxone. After urine culture susceptibility data was available, the incidence of patients being treated increased from 54% to 71%. Approximately 80% of patients on ceftriaxone had antibiotics changed to a different beta-lactam or a fluoroquinolone. Nineteen patients had indwelling catheters and of those, only one-third had their Foley catheter removed. Overall, 11 patients without symptoms and without pyuria in urine still received antimicrobial therapy.

Conclusion: The results of the study showed that despite guideline recommendations, patients are still being initiated on antibiotics for ASB. Limitations of the study include the fact that this is retrospective study with small sample size and there was also reliance on documentation in the medical progress notes for mention of UTI symptoms. However, there is a tendency to respond to positive cultures, which leads to inappropriate antibiotic treatment. Future directions include implementing an in-hospital protocol providing guideline recommendations on treatment of UTIs and ASB including guidance on when to order UA or urine cultures.

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(Continued from page 1) Topping the Charts of High-Alert Medications

In the ISMP review, the most common reason for errors with opioids, antipsychotics, antithrombotics, and insulins was errors in dosing; while the most common reason for errors with antibiotics was wrong drug.

Preventive strategies to reduce errors should be multi-faceted and tailored to each medication class to help mitigate such errors. Tallman lettering is one of the techniques used on look-alike sound-alike drugs so they will not get confused for the wrong medication. Restricted access and storage of these drugs can also contribute to the reduction of medication errors.⁴ Discussions among multidisciplinary teams can raise awareness of errors that have occurred and facilitate implementing policies that could aid in reducing these events.⁵

ISMP Identified Reasons for Adverse Events (2016)

Medication Class	Wrong Drug	Wrong Dose	Wrong Patient	Other*
Narcotics/Opioids	39%	47%	1%	12%
Antibiotics	44%	34%	4%	4%
Antipsychotics	32%	43%	9%	10%
Antithrombotics	17%	54%	17%	4%
Insulins	33%	53%	8%	5%
All Drugs	35%	31%	11%	22%

*= Wrong: Route, Quantity, Instructions

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MEDICATION MATTERS

New Drug Primer: Dantrolene Sodium (Ryanodex[®])

by Nubriel Hernandez, PharmD Candidate, and Jane Ching, Pharmacy Practice Resident

Dantrolene sodium (Ryanodex[®]) is indicated for treatment of malignant hyperthermia (MH), which is a potentially fatal emergency that may occur after an individual is exposed to the neuromuscular blocker succinylcholine or volatile anesthetics. MH is characterized by uncontrolled release of calcium from skeletal muscle that leads to uncontrolled muscle contractions. Dantrolene prevents release of myoplasmic calcium by inhibiting ryanodine receptors and thereby prevents further muscle contraction and damage.

This new formulation is easier to store and prepare as compared to the traditional powder formulation Dantrium[®]. For the same 70-kg patient, Dantrium[®] requires 9 vials to be reconstituted at 8 minutes per vial, whereas Ryanodex[®] only requires only one vial that can be reconstituted in about 20 seconds. In an emergency, sometimes every second counts.

UHB Indications and Doses:

- Treatment of malignant hyperthermia in conjunction with appropriate supportive measures: IV push at minimum dose of 1 mg/kg. Doses may be repeated up to a maximum cumulative dose of 10 mg/kg.
- Prevention of malignant hyperthermia in patients at high risk: 2.5 mg/kg IV push over 1 minute, 75 min pre-surgery

Contraindications and Precautions:

- Contraindications: None
- Precautions: Muscle weakness . patients should not ambulate without assistance until normal strength and balance are restored

Adverse Reactions:

- Loss of grip strength and weakness in the legs
- Drowsiness and dizziness, nausea, thrombophlebitis
- Tissue necrosis secondary to extravasation, urticaria, erythema, and injection site reactions



Nurses Want To Know ...

Q: Why are some medications labeled "Hazardous Drugs"? Are they chemotherapy? A: Unlike high-alert medications, which may result in a greater risk of harm to a patient when errors occur with these medications, hazardous drugs are medications with potential risks to health-care professionals through exposure over time. Depending on the medication, risks may include localized skin reactions, cancers, infertility, or birth defects.

The hospital list of hazardous drugs is based on recommendations from the National Institute for Occupational Safety and Health. Antineoplastic agents are labeled in HealthBridge as "Chemotherapy/Hazardous Drug," and these require chemotherapy personal protective equipment (PPE). Non-antineoplastic hazardous drugs are labeled only as "Hazardous Drugs". Examples include immune suppressants, some anti-infectives and some seizure medications. It is also recommended that PPE be worn when preparing or administering these medications. See policy "Reducing Occupational Exposure to Hazardous Drugs" (SAF-24) for more details.

Spotlight on Safety: Showdown of Doses versus Days

by LilyAnn Jeu, Medication Safety/Internal Medicine Clinical Pharmacist

What's wrong with this order?

ceFAZolin IVPB - - [Ordered as ANCEF IVPB.] 1 Gram(s) IV Intermittent Infusion Every 8 Hours Infuse Over 30 Minute(s) For 2 Days Pharm Note x3 doses Nurse Instructions x 3 doses Medication orders must clearly indicate an endpoint in terms of number of doses or duration of orders. When schedules do not coincide, patients are placed at risk for extra doses or inadequate therapy.

In this case, the physician ordered one dose every 8 hours for 2 days, which generated 6 %asks+on the Worklist Manager (a.k.a., electronic medication administration record). However, in the Pharm Note and Nurse Instructions, the physician also typed notations for only 3 doses. This patient received 4 doses for this order, with the potential for 2 more.

While one extra dose may not seem like a lot, inappropriate overuse of antimicrobials among numerous patients may contribute to antimicrobial resistance for patients in general. In addition, some hospital quality measures (such as the Surgical Care Improvement Project Core Measure Set) require antibiotics to be discontinued within specific time frames. Violations of recommendations may jeopardize hospital payment for care.



Clinical Pearls: Rosuvastation Use in Severe Renal Impairment by Yanmen Yang, Pharmacy Practice Resident

Current available literature regarding rosuvastatin dosing in severe renal impairment, or chronic kidney disease (CKD) stages 3-5 (CrCl < 30 mL/min/1.72 m²), is limited to a maximum daily dose of 10 mg as recommended by the manufacturer.¹ For patients who meet criteria for high-intensity statin therapy, this recommendation may be suboptimal in reaching the target 50% low-density lipoprotein (LDL) reduction.² In addition, lipid management guidelines are incongruent in their recommendations. While the Kidney Disease: Improving Global Outcomes (KDIGO) recommends a conservative approach to using clinically studied doses for CKD, the American College of Cardiology/American Heart Association (ACC/AHA) recommends using standard high-intensity statin doses, equating to rosuvastatin 20-40 mg daily.³

Although rosuvastatin has minimal renal clearance, the concern for an increased risk of adverse effects is present in patients with severe CKD as a 3-fold increase in the rosuvastatin serum concentrations. A meta-analysis of 25 studies that included 19,621 subjects showed no significant difference in rates of myalgia, creatine phosphokinase (CPK) levels, or alanine aminotransferase (ALT) levels in 1:1, 1:2, or 1:4 dose comparisons of rosuvastatin to atorvastatin. Rosuvastatin showed increased LDL reduction with 1:1 or 1:2 dose ratio and no difference in 1:4 dose ratio compared with atorvastatin.⁴ Similarly, Kostapanos *et al.* observed that rosuvastatin was found to have a side effect profile reflective of the statin drug class and remains well tolerated.⁵

Based on these studies, equivalent rosuvastatin therapy interchange may be appropriate during hospitalization for patients with severe CKD although caution should be used with higher doses of 40 mg daily as it has been associated with renal failure.⁵ Patients should be monitored for symptoms of myalgia, further decline in renal function, and elevation of CPK levels (if patients become symptomatic). Patients not tolerating rosuvastatin may require a dose reduction or discontinuation during the hospitalization. Regardless, all patients should be instructed to resume the tolerated home statin therapy post-discharge.

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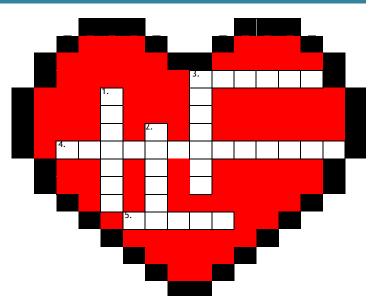
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Answers to Crossword Puzzle:

Down:1. Urgency2. Angina3. StatinsAcross:3. Sodium4. ACE Inhibitors5. Fatty

Crossword Puzzle: Heart Health

by Jane Ching, Pharmacy Practice Resident



<u>Down</u>

- 1. A blood pressure of 180/120 mm Hg or more without target organ damage is known as % ypertensive ____+.
- 2. Chest pain is also known as <u>%</u>
- 3. _____ decrease LDL cholesterol and triglycerides, yet increase HDL cholesterol.

<u>Across</u>

- 3. The American Heart Association recommends limiting ______ to 2,000 mg per day.
- 4. _____block production of angiotensin II, leading to vasodilation and reduction of blood pressure.
- The American Heart Association recommends eating fish at least twice a week as a source of omega-3 ______ acids.

ନ୍ଧର Team Tip of the Day

Upon Patient Transfer ... Save Time, Save Money, Save Lives

Except oral and injectable vials/ampules of controlled substances, send all medication doses, inhalers, eye drops, and topical products to the next inpatient location in a sealed security bag.

Label bag with patient name, second identifier, and new location.

Sending medications with patients reduces waste and delays in continuing care.

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Medication Matters is the triannual pharmacy newsletter at SUNY Downstate Medical Center, published every February, June and October. Please submit any suggestions or comments to ljeu@downstate.edu.