Pharmacy Happenings

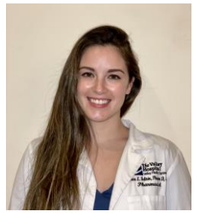
We are proud to announce our newest **Board Certified Pharmacists**! Certification by the Board of Pharmacy Specialties requires specified hours of practice and a rigorous exam, enabling pharmacists to improve patient outcomes through specialty care. Pharmacists Board Certified in Pharmacotherapy earn the designation "BCPS." To learn more about pharmacist board certification, visit ***https://www.bpsweb.org/***

Here are our newest board certified pharmacists, joining an already prestigious list in our health-system:

Aviva Farbowitz
PharmD, BCPS

Alexandra Kovary
PharmD, BCPS

Veronica Prisco
PharmD, MHS, BCPS

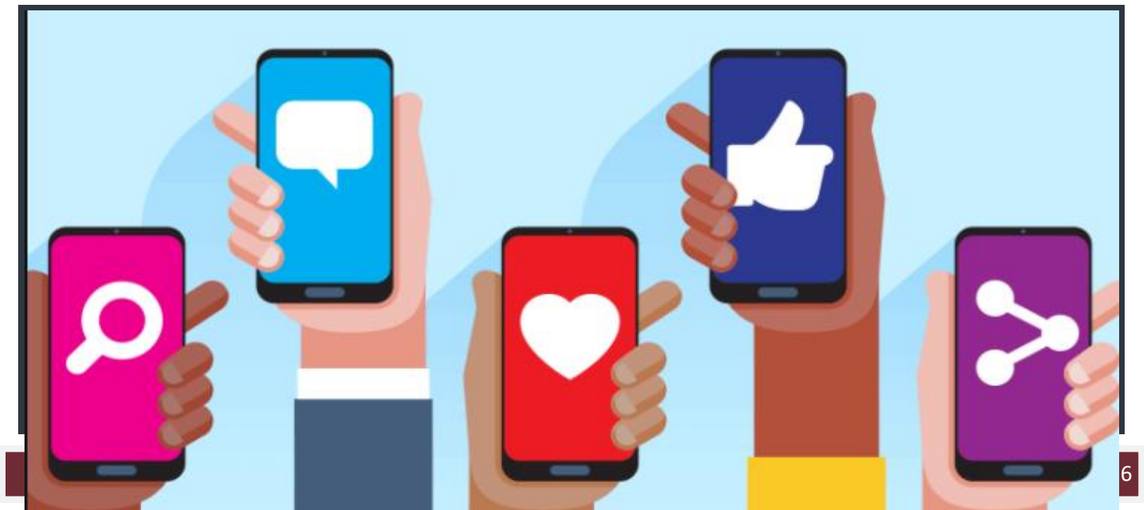


On the web

Visit our updated pharmacy residency website, which includes a 3 min 10 sec video highlighting our residency program: ***https://www.valleyhealth.com/services/pharmacy-residency-programs***

PGY1 Pharmacy Resident **Joanne Son, PharmD,** presented a community outreach program on CBD oil. You can watch this informational and relevant presentation on Valley's Youtube channel: ***https://www.youtube.com/watch?app=desktop&v=OM7fZ_IuwDk***

The pharmacy department joins other health-system team members in a Youtube video welcoming the COVID19 vaccine into our hospital! ***https://youtu.be/bbUkTPPMcic***



Journal of
The Valley
Hospital Pharmacy

Volume
20-21
Winter

Pharmacy Focus

Formulary Update

Clevidipine (Cleviprex®)

Clevidipine is an **ultra-short acting dihydropyridine calcium channel blocker** that may be beneficial for patients with acute ischemic stroke (AIS) patients who are eligible for emergency reperfusion therapy except have an elevated blood pressure. Recent updates in the AHA/ASA guidelines for the early management of AIS indicate clevidipine is a **treatment option for arterial hypertension in patients with AIS** who are candidates for emergency reperfusion therapy. Current formulary alternatives include nicardipine and labetalol. Although clevidipine is more costly than nicardipine, there are benefits considering clevidipine is premixed and more easily accessible. It is estimated that 4 stroke patients per year would require clevidipine treatment here at The Valley Hospital. As of November, clevidipine is now approved **on formulary for both cardiac surgery and acute ischemic stroke patients.**

Baricitinib (Olumiant®)

Baricitinib is currently FDA-approved to treat rheumatoid arthritis but it is added to our formulary for **off-label use in COVID-19 as an adjunct to remdesevir**. It is a Janus kinase (JAK) inhibitor, which may reduce cytokine storm associated with COVID-19. Baricitinib is for treatment of suspected or laboratory confirmed COVID-19 in:

- Hospitalized adults
- Pediatric patients 2 years of age or older
- Patients requiring supplemental oxygen, invasive mechanical ventilation, or extracorporeal membrane oxygenation (ECMO).

It is a **once daily oral tablet** administered for 14 days or until hospital discharge, whichever is first. Dose depends on patient's age, weight, and renal function.

Bamlanivimab

Bamlanivimab is a recombinant, neutralizing human IgG1 monoclonal antibody (mAb) designed to block viral attachment by binding to the receptor binding domain of the spike protein of SARS-CoV-19, therefore reducing viral replication. It received **Emergency Use Authorization** on Nov. 9, 2020 to use in the **treatment of mild to moderate COVID-19** in patients at least 12 years or older weighing at least 40 kg with a positive COVID-19 test, who are at ***high-risk*** for progressive to severe COVID-19 and/or hospitalization. This is a **single dose of 700 mg given via IV infusion** over 60 minutes recommended to be given as soon as possible following a positive viral test and within 10 days of symptom onset.

Drug Info Corner

Neha Siddiqui, Pharm.D.
PGY1 Pharmacy Resident

Question: Is there a role for gabapentin in acute alcohol withdrawal syndrome and alcohol use disorder?

Answer: **Gabapentin** is indicated for post-herpetic neuralgia in adults, adjunctive therapy in the treatment of partial onset seizures, with and without secondary generalization, and in adults and pediatric patients 3 years and older with epilepsy. Gabapentin (Neurontin®) is **structurally related to the neurotransmitter GABA**. GABA (gamma-aminobutyric acid) is an inhibitory neurotransmitter that is very widely distributed in the neurons of the cortex. However, gabapentin and its metabolites do not bind to $GABA_A$ or $GABA_B$ receptors or influence the degradation or uptake of GABA. The mechanism by which gabapentin exerts its analgesic and anticonvulsant effects is unknown.[1]

Alcohol use disorder (AUD) is the third leading modifiable cause of death in the United States.[2] Alcohol is a depressant that one's body begins to rely on over the course of months to years of drinking. The brain eventually stops producing certain chemicals that it receives from alcohol, becoming dependent on the drug. **Alcohol is an indirect GABA agonist** and believed to mimic GABA's effect in the brain by binding to GABA receptors and inhibiting neuronal signaling. When patients with long-term alcohol exposure suddenly cease alcohol intake, clinical signs and symptoms of alcohol withdrawal syndrome result from a combination of reduced GABA-ergic activity and enhanced glutamatergic activity. This can cause **withdrawal symptoms such as headache, fever, nausea, irregular heartbeat and hallucinations**. Alcohol withdrawal syndrome is mediated by a variety of mechanisms. The brain maintains neurochemical balance through inhibitory and excitatory neurotransmitters. Alcohol enhances the effect of GABA and $GABA_A$ neuroreceptors, resulting in decrease overall brain excitability.[3]

Gabapentin is used off-label to treat alcohol-related withdrawal, cravings, anxiety, and insomnia. It has demonstrated efficacy for mild alcohol withdrawal and early abstinence. Gabapentin can help improve sleep, cravings, and mood. The **dose is usually 600-1800 mg/day by mouth in three divided doses** for alcohol use disorder. It can cause dizziness, somnolence, ataxia, or gait disorder. Gabapentin is a safe, readily available, and effective drug for alcohol-use disorder treatment, specifically for the abstinence maintenance phase.[4] In conclusion, gabapentin reduces alcohol consumption and craving, which may help patients to maintain abstinence.

For patients with alcohol withdrawal syndrome at The Valley Hospital, the current medications given to patients depend on their Clinical Institute Withdrawal Assessment (CIWA) Form for Alcohol and medications in the protocol include benzodiazepines. The benzodiazepines of choice are lorazepam and chlordiazepoxide. Other medications for supportive care include thiamine, a multivitamin, folic acid, and acetaminophen.

Patients that may benefit from the addition of gabapentin during admission include patients that need:

- Lower doses of benzodiazepines due to excessive use, tolerance, or intolerable side effects
- Improvement in sleep
- An additional anxiolytic and sedative as gabapentin is an agent that potentially can target symptoms analogous with alcohol withdrawal symptoms when the use of benzodiazepines becomes a safety concern.

Early addition of high-dose gabapentin has also been shown to stabilize patients' withdrawal-related symptoms faster and shorten hospital length of stay.[4]

References: 1. NEURONTIN® (gabapentin) HIGHLIGHTS OF PRESCRIBING INFORMATION. (2017, October). Retrieved from https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/020235s064_020882s047_ 021129s046lbl.pdf 2. Mason BJ, Quello S, Goodell V, Shadan F, Kyle M, Begovic A. Gabapentin treatment for alcohol dependence: a randomized clinical trial. JAMA Intern Med. 2014;174(1):70-77. doi:10.1001/jamainternmed.2013.11950 3. Patel R, Dickenson AH. Mechanisms of the gabapentinoids and α 2 δ-1 calcium channel subunit in neuropathic pain. Pharmacol Res Perspect. 2016;4(2): e00205. Published 2016 Feb 27. doi:10.1002/prp2.205 4. Levine AR, Carrasquillo L, Mueller J, Nounou MI, Naut ER, Ibrahim D. High-Dose Gabapentin for the Treatment of Severe Alcohol Withdrawal Syndrome: A Retrospective Cohort Analysis. Pharmacotherapy. 2019; 39(9): 881-888. doi:10.1002/phar.2309

Pharmacy residents present at American Society of Health-System Pharmacists national conference

ashp MIDYEAR2020 Clinical Meeting & Exhibition

Poster title: Assessing and improving adherence to second dose of shingles vaccination in adult patients in a community pharmacy. Barbara Abboud, PharmD, MBA, PGY1 Community-based Pharmacy Resident

Shingles is a viral infection caused by Varicella-Zoster virus, the same virus that causes chickenpox. Since its approval for patients 50 years of age and older in 2017, the recombinant zoster vaccine (Shingrix®) has become the preferred shingles vaccine by the Advisory Committee on Immunization Practice (ACIP). Shingrix® is given in two doses, the second dose being administered anytime between two to six months after the first dose. The purpose of this quality improvement project was to evaluate patients that received at least one dose of Shingrix® in our community pharmacies to determine adherence to the second dose of Shingrix®, and provide intervention as appropriate to increase adherence. Reports were run on the pharmacy outpatient computer system to identify patients that had at least one dose of product name "Shingrix," which included all the National Drug Codes (NDC) available of Shingrix® vaccine. Patients were excluded if they were under the age of 50 years old or if they received the first dose within two months of evaluating the report, indicating they are too early to receive the second dose at the time of data analysis. Our findings indicated that the majority of patients were adherent with their second dose. Most of the patients that got only one dose of Shingrix® at our pharmacy did receive the second dose at another pharmacy. Phone call-interventions made by pharmacists improved adherence in a community-based setting leading to engagement with our health-system and generate revenue.

Poster title: Medication use evaluation: tocilizumab (Actemra ®) in COVID-19 patients. Neha Siddiqui, PharmD, PGY1 Pharmacy Resident

Tocilizumab or Actemra® is an interleukin-6 (IL-6) receptor blocker which was under the investigational use in the treatment of COVID-19. IL-6 may play a key role in driving the inflammatory immune response that causes acute respiratory distress syndrome in patients critically ill from COVID-19. The Valley Hospital, as we know, is a large community hospital in northern New Jersey that was the epicenter of the COVID-19 outbreak in the United States in early 2020. This medication use evaluation for tocilizumab serves to evaluate cytokine storm markers in patients diagnosed or suspected with COVID-19 who utilized tocilizumab and to identify the potential adverse reaction of new onset infection in COVID-19 patients after receiving tocilizumab. Patients were selected from The Valley Hospital EMR MediTech. A drug utilization report was conducted from March 15, 2020 to June 15, 2020 to flag all patients with an order for tocilizumab. Patient charts were reviewed, and data was collected on the information listed below. Indication and dose of administered tocilizumab was classified as appropriate if the patient met the indications as per The Valley Hospital's protocol for tocilizumab use in SARS-CoV-2 patients. A cytokine storm is non-specific to COVID-19 and can be related to other conditions such as sepsis which is important to note, and tocilizumab was no longer being used in current practice for the treatment of COVID-19, however recently it has been discovered that it may be effective for COVID-19 patients. Tocilizumab is still under investigation regardless.

Poster title: Evaluation of remdesivir use in COVID-19 patients in a large community hospital. Joanne Son, PharmD, PGY1 Pharmacy Resident

The Valley Hospital was involved in the compassionate use of remdesivir, an investigational antiviral drug, during the COVID-19 outbreak in early 2020. When the Food and Drug Administration (FDA) approved emergency use authorization (EUA) of remdesivir to treat patients hospitalized with COVID-19, an interdisciplinary task force, which included pharmacists, created guidelines for use of remdesivir under the EUA to be implemented by The Valley Hospital. A retrospective chart review was conducted on all adult patients admitted to The Valley Hospital in Ridgewood, New Jersey who received remdesivir from May 1, 2020 through September 30, 2020. The purpose of this project was to evaluate the adherence to the criteria for usage of remdesivir under The Valley Hospital's EUA guidelines in patients diagnosed with COVID-19 and any adverse events associated with the use of remdesivir.

Glucagon-like 1 peptide (GLP-1) receptor agonist "PENS"

Sarah Haines, FDU PharmD Candidate 2021

GLP-1 receptor agonists are FDA approved as **adjunct therapy to diet and exercise for Type 2 diabetic patients.** This drug class improves glycemic control in adults by:

- decreasing glucagon secretion
- increasing glucose-dependent insulin secretion
- increasing pancreas beta cell growth/replication
- decreasing food intake
- slowing gastric emptying

Some **common adverse reactions** with GLP-1 receptor agonists include **nausea, diarrhea, vomiting**.

These drugs are **contraindicated** in patients with personal or family history of medullary thyroid carcinoma (MTC) and multiple endocrine neoplasia syndrome type 2 (MEN2).

While **this drug class is not on formulary at The Valley Hospital**, patients when admitted to the hospital may bring one of these prefilled "pens" in as a "patient own medication." These medications are subcutaneous injections but **are not insulin** and require special instructions on the time and frequency of injection.[1]

The most commonly used GLP1 agonists are listed in the **table on page 4**. It is important to note that **differences between the agents include:**

- if the pens are single-dose or multi-dose
- if the needle is included
- how long the pen is good for once it's opened
- storage requirements

References:
1. American Diabetes Association. Standards of medical care in diabetes – 2020. The Journal of Clinical and Applied Research and Education. 2020;43. Available at: https://care.diabetesjournals.org/content/diacare/suppl/2019/12/20/43.Supplement_1.DC1/DC_43_S1_2020.pdf Accessed July 7, 2020.
2. Byetta. FDA Package Insert. Amylin Pharmaceuticals, Inc. San Diego, CA. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2009/021773s9s11s18s22s25lbl.pdf Accessed July 7, 2020.
3. Ozempic. FDA Package Insert. Novo Nordisk, Inc. Plainsboro, NJ. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/209637lbl.pdf Accessed July 7, 2020.
4. Trulicity. FDA Package Insert. Eli Lilly and Company. Indianapolis, IN. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/209637lbl.pdf Accessed July 7, 2020.
5. Victoza. FDA Package Insert. Novo Nordisk, Inc. Plainsboro, NJ. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/022341s027lbl.pdf Accessed July 7, 2020.

Continued on page 4…..

… Continued from page 3. **Common GLP-1 receptor agonists as pens for injection[2-5]**

				
Brand name ***Generic name***	Byetta® Exenatide	Ozempic® Semaglutide	Trulicity® Dulaglutide	Victoza® Liraglutide
Pen sizes/doses	250 mcg/mL 5 mcg dose, 1.2 mL pen 10 mcg dose, 2.4 mL pen	2 mg/1.5 mL pen that delivers 0.25 mg or 0.5 mg per injection 2 mg/1.5 mL pen that delivers 1 mg per injection	0.75 mg/0.5 mL solution in single-dose pen 1.5 mg/0.5 mL solution in single-dose pen	6 mg/mL pen Delivers 0.6 mg dose Delivers 1.2 mg dose Delivers 1.8 mg dose
Single or multiple usage	Multiple	Multiple	Single	Multiple
Starting dose	5 mcg twice daily	0.25 mg once weekly	0.75 mg once weekly	0.6 mg once daily
Route of administration	Subcutaneous injection: abdomen, thigh, or upper arm			
Interval between injections	Inject 60 minutes prior to morning and evening meals (approximately 6 hours apart)	Once weekly with or without meals	Once weekly with or without meals	Once daily at the same time of day
Refrigeration/ Beyond use date (BUD)	Refrigerator BUD 30 days after first use	Room temperature or refrigerator BUD 56 days after first use	Room temperature: BUD 14 days Refrigerator: BUD Do not use past expiration date	Room temperature or refrigerator BUD 30 days after first use
Pen needle tip inclusion	No, must be purchased separately (prescription needed for needles)	Yes, 4 Novofine Plus needles are included	Yes, needle attached to pen	No, must be purchased separately (prescription needed for needles)