Continued from page 5: Managing hypomagnesemia

Table 1. Options for magnesium replacement

	Route of administration for magnesium supplement	*Dose*	*When to recheck serum magnesium level*
Mild or moderate hypomagnesemia; asymptomatic; 1.2 - 1.5 mg/dL ***Empirically replace when replacing K+ or Ca++***[5]	Oral	Sustained release magnesium oxide 400 mg twice to three times daily.[1,2] Continue therapy for 3 to 5 days.[5] IF UNABLE TO TAKE PO: 2 gm magnesium sulfate in 100 mL D5W IV over 10 minutes twice to three times daily[6]	Check prior to each dose[8]
Severe and/or symptomatic hypomagnesemia; less than 1.2 mg/dL[1,5,6]	IV or IM	**Option 1** (preferred) IV bolus followed by IV infusion 1 to 2 g of magnesium sulfate in 100 mL of D5W over 5 to 15 min[1,2] followed by a continuous infusion 4 to 6 g/day for 3 to 5 days in normal renal function (CrCl more than 30 mL/min/1.73 m^2)[1,7] (10 gm magnesium sulfate in 1 L D5W)[5] **Option 2** IV bolus repeat infusions 2 gm magnesium sulfate in 100 mL D5W over 10 minutes every 6 hours[6] **Option 3** IM (not preferred due to pain)[7] 1 gm magnesium sulfate in 2 mL D5W (magnesium 50%)[5]	Check prior to each dose (at least daily)[8]

Editorial Staff

Editors in Chief: Maria Leibfried, Pharm.D. BCNSP; Carlo Lupano, RPh, MBA, FASHP
Editorial Director: Ron Krych, RPh, MPA
Editorial Advisor: Tomas Hiciano, RPh, MS
Editors: Alexandra Kovary, Pharm.D., BCPS; Veronica Prisco, Pharm.D., BCPS
Contributors:
Barbara Abboud, PharmD, MBA
Mohammed Basuf, Pharm.D.
Ibeth Garcia, BS, MPH, FDU Pharm.D. Candidate
Maria Leibfried, Pharm.D., BCNSP
Shruti Patel, CPhT, FDU Pharm.D. Candidate
Aarezo Riaz, PharmD
Neha Siddiqui, PharmD

www.valleyhealth.com/pharmacy

Journal of The Valley Hospital Pharmacy

Pharmacy Focus

Volume 21-22 Fall-Winter

Formulary Update

Brilliant Blue G (BBG)

Brilliant Blue G (BBG) is a drug for **staining the internal limiting membrane (ILM) of the eye**. Brilliant Blue is injected onto the internal retinal surface, enabling the ILM to be clearly stained and distinguished from unstained retina which facilitates removal. Brilliant Blue G is indicated for improving visualization of the membrane of the retina. The drug is injected directly in a Balanced Salt Solution (BSS)-filled vitreous cavity.

Tofacitinib (Xeljanz®)

Tofacitinib is an oral tablet to be used as **adjunct therapy for COVID-19 pneumonia** for patients who are not responding to steroid therapy and are severely hypoxemic. The clinical trials for this medication point to this medication as an appropriate adjunct therapy option in addition to standard COVID-19 treatment. Referencing the Pfizer trial, Tofacitinib had a statistically significant and medium size effect on reducing the overall incidence of death or respiratory failure in patients. Currently, The Valley Hospital **also has tocilizumab on formulary** to be used in COVID-19 treatment, however, tocilizumab cannot be currently obtained.

Dapagliflozin (Farxiga®)

Dapagliflozin is an oral tablet approved by the FDA for **treatment of heart failure with reduced ejection fraction** (HFrEF) and for patients with **type 2 diabetes mellitus**. Dapagliflozin is an inhibitor of sodium-glucose cotransporter 2 (SGLT2). By inhibiting SGLT2, dapagliflozin reduces reabsorption of filtered glucose, thereby promoting urinary glucose excretion. It also reduces sodium reabsorption and increases the delivery of sodium to the distal tubule. This may influence several physiological functions including, lowering both preload and afterload of the heart and downregulation of sympathetic activity, and decreased intraglomerular pressure, which is believed to be mediated by increased tubuloglomerular feedback. The most common adverse effects include female genital mycotic infections, nasopharyngitis, and urinary tract infections. **Empagliflozin tablets (Jardiance®), another SGLT2 inhibitor approved for use in patients with HFrEF, is on formulary as well.**

Drug Info Corner

Ibeth Garcia, BS, MPH
FDU PharmD Candidate 2022

***Question:* Can the Covid vaccine be administered to patients with Guillain-Barre?**

***Response*:** Guillain-Barre Syndrome (GBS) is a **rare, autoimmune disorder** where a person's own immune system attacks the nerves.[1] In mild cases it can cause brief muscle weakness and in severe cases, paralysis, where the person is unable to breathe independently. Fortunately, most people recover fully, but some will continue to have some degree of muscle weakness.[1,2] The **cause of GBS is not well understood**, but it has been known to develop after infection from certain viruses and bacteria, such as Campylobacter jejuni (causes gastroenteritis), cytomegalovirus, and Epstein Barr virus.[1]

GBS was **first linked to vaccines after the 1976 swine flu vaccine** program, where increased reports arose soon after administration. This resulted in the FDA listing **GBS as a possible rare side effect of all flu vaccines** thereafter and initiating a reporting program called VAERS to help track incidences of rare side effects. **Other vaccinations** that carry a possibility of GBS include shingles, tetanus, and typhoid-containing vaccines.[1]

There have been **Vaccine Adverse Event Reporting System (VAERS) reports of GBS after administration of COVID-19 vaccines.**[3,5,6] The FDA has only been able to verify cases after administration of Janssen's COVID-19 vaccine, a vector vaccine, and has since listed GBS as a very rare side effect of it.[3] Similar warnings have not been issued for the mRNA vaccines, Pfizer-BioNtech and Moderna as of October 2021.

CDC guidelines suggest that people with autoimmune conditions, including GBS, can receive an FDA authorized COVID-19 vaccine.[4] Although there is a risk for a GBS flare-up, the risk of severe symptoms from COVID infection is higher if unvaccinated. The only contraindications to COVID-19 vaccination currently are:[4]

- History of severe allergic reaction after previous dose
- Immediate allergic reaction of any severity after a previous dose
- Diagnosed allergy to any component of a COVID vaccine.

The CDC's Advisory Committee on Immunization Practice (ACIP) best practices for immunization also support that a **history of GBS is not a contraindication to COVID-19 vaccination** and only issue a precaution for GBS with influenza and tetanus-containing vaccines.[4]

For patients who have a history of or current GBS and are considering a COVID-19 vaccine, it is not contraindicated. However, it is recommended to have a discussion with their providers to determine which COVID-19 vaccine is best suited for them based on the benefits and risks.[4]

To report a reaction to a vaccine, go to VAERS at https://vaers.hhs.gov/

References: *1.* Center for Disease Control and Prevention. Guillian Barre Syndrome and Vaccines. https://www.cdc.gov/vaccinesafety/concerns/guillain-barre-syndrome.html. Accessed October 13, 2021. 2. National Institute of Neurological Disorders and Stroke. Guillian Barre Syndrome Fact Sheet. https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Guillain-Barr%C3%A9-Syndrome-Fact-Sheet. Accessed October 13, 2021. 3. Center for Disease Control and Prevention. U.S COVID-19 Vaccine Product Information. https://www.cdc.gov/vaccines/covid-19/info-by-product/index.html. Accessed October 13, 2021. 4. Center for Disease Control and Prevention. Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States. https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fvaccines%2Fcovid-19%2Finfo-by-product%2Fclinical-considerations.html. Accessed October 20, 2021. 5. United States Department of Health and Human Services (DHHS), Public Health Service (PHS), Centers for Disease Control (CDC) / Food and Drug Administration (FDA), Vaccine Adverse Event Reporting System (VAERS) 1990 - 10/15/2021, CDC WONDER On-line Database. Accessed at http://wonder.cdc.gov/vaers.html on Oct 23, 2021. 6. U. S. Food and Drug Administration. Center for Drug Evaluation and Research. (2004). Coronavirus Update. Washington, DC. https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-july-13-2021. Accessed October 23, 2021.

Managing hypomagnesemia

Shruti Patel, CPhT, FDU PharmD Candidate 2023

Magnesium is the second-most abundant cation in the body (potassium is first!)[1] Hypomagnesemia, defined as a **serum magnesium (Mg++) concentration less than 1.4 mg/dL,** occurs in up to 20% of hospitalized patients and 25% in outpatients with diabetes. If untreated or/and undetected, hypomagnesemia can cause serious cardiovascular and neuromuscular conditions such as atrial fibrillation, cardiac ischemia, seizures, coma.[2]

Hypomagnesemia is caused due to:[2]

- Drug-induced (loop and thiazide diuretics, proton pump inhibitors, amphotericin B)
- Alcohol use disorder
- Starvation
- Gastrointestinal or renal loss
- Critically ill patients receiving total parenteral nutrition (TPN)
- Hypokalemia

Determining etiology of hypomagnesemia is important to ensure proper patient management. Monitoring of magnesium levels during treatment is essential because hypomagnesemia can cause other electrolyte abnormalities especially hypocalcemia due to a decrease in parathyroid hormone.[2]

Hypomagnesemia severity is classified as mild, moderate, and severe:

Mild: Serum Mg++ 1.6 - 1.9 mg/dL[8]
Moderate: Serum Mg++ 1.2 - 1.5 mg/dL[1,8]
Severe: Serum Mg++ less than 1.2 mg/d[1,5,6]

Principles of magnesium replacement:

Magnesium supplementation is administered orally, intravenously, or intramuscularly.
Reduce doses by 50% in patients with renal dysfunction.
It takes several days for total body magnesium to be replaced and for that to be reflected in the serum levels.[7,8]
Along with checking magnesium levels, **check phosphate, calcium, and potassium** because these are affected with changes in magnesium levels.[1-3]

See page 6 for a guide on replacing magnesium.

References:

1. Martin KJ, González EA, Slatopolsky E. Clinical Consequences and Management of Hypomagnesemia. *Journal of the American Society of Nephrology*. 2008;20(11):2291-2295. doi:10.1681/asn.2007111194.
2. Giragosian A. Hypomagnesemia. Stat Pearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK500003/. Published September 6, 2020. Accessed July 8, 2021.
3. Fulop T. Hypomagnesemia treatment & management. Medscape. https://emedicine.medscape.com/article/2038394-treatment#d10 Accessed Nov. 29, 2021.
4. Global RPh. Magnesium supplements. https://globalrph.com/drugs/magnesium-supplements/ Accessed Nov. 29, 2021.
5. Lewis III JL. Hypomagnesemia. Merck Manual. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypomagnesemia Accessed Nov. 29, 2021.
6. Farkas J. Hypomagnesemia. In: The Internet Book of Critical Care. Aug 2019. https://emcrit.org/ibcc/hypomagnesemia/ Accessed Nov. 29, 2021.
7. Karosanidze T. Magnesium – so underappreciated. *Practical Gastroenterology*. 2014 Jan:24-34. https://med.virginia.edu/ginutrition/wp-content/uploads/sites/199/2014/06/Karosanidze-Jan-2014.pdf
8. Yu ASL. Hypomagnesemia: Evaluation and treatment. *Up-to-date.* May 21, 2021. https://www-uptodate-com.libaccess.fdu.edu/contents/hypomagnesemia-evaluation-and-treatment?search=hypomagnesemia&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H3 Accessed Nov. 29, 2021.

Post-vaccine
Epinephrine & Diphenhydramine Dosing

Valley Health System

- Use DIPHENHYDRAMINE for mild symptoms of allergic reaction.
- Use EPINEPHRINE for moderate-severe symptoms of allergic reaction & call 911[1]

DIPHENHYDRAMINE (BENADRYL®)[2]

Diphenhydramine (Benadryl®) oral	25 mg/tablet or capsule 12.5 mg/chewable tablet 12.5 mg/5 mL liquid
Adults & children 12 years and older	25 mg x 1 dose[1,2]
Children 6 through 11 years	Dose is weight-based – see table[6]
Children 5 years and under	Dose is weight-based - AFTER consultation with on-site physician – see table[1,6] Use liquid only

Diphenhydramine dosing table[6]

Weight →	20 to 24 pounds (about 9 to 10 kilograms)	25 to 37 pounds (about 11 to 16 kilograms)	38 to 49 pounds (about 17 to 22 kilograms)	50 to 99 pounds (about 23 to 45 kilograms)	100 pounds or more (46 kilograms or more)
Children's Liquid Diphenhydramine (12.5 mg / 5 mL)	4 mL	5 mL	7.5 mL	10 mL	—
Children's Diphenhydramine Chewable Tablets (12.5 mg)	—	1 tablet	1 ½ tablets	2 tablets	4 tablets
Diphenhydramine Tablets (25 mg)	—	½ tablet	½ tablet	1 tablet	2 tablets
Diphenhydramine Capsules (25 mg)	—	—	—	1 capsule	2 capsules

EPINEPHRINE (EPIPEN®)[3]

Epinephrine (Epipen®) Yellow Box IM or SQ injection	0.3 mg/dose (0.3 mL)	**30 kg or greater** (66 pounds or greater) may repeat in 5 - 15 minutes[4,5]
Epinephrine pediatrics (Epipen Jr®) Green Box IM or SQ injection	0.15 mg/dose (0.3 mL)	**15-30 kg** (33-66 pounds) may repeat in 5 - 15 minutes[4,5]

References 1. TVH Post COVID19 Vaccination protocol and collaborative agreement. May 11, 2021. Pediatric ages 5-11 updated Nov. 2021. 2. Johnson & Johnson Consumer Inc. Benadryl Dosing Guide. BENADRYL®. https://www.benadryl.com/benadryl-dosing-guide. Accessed April 22, 2021. 3. Epinephrine (Epipen) Package Insert. Mylan Specialty. Revised 12/20/2020 4. EpiPen and EpiPen Jr dosage and administration. https://www.epipen.com/hcp/about-epipen-and-generic/dosage-and-administration accessed May 11, 2021. 5. NIAID-Expert Panel. Guidelines for the diagnosis and management of food allergy in the United States: Report of the NIAID Expert Panel. The Journal of Allergy and Clinical Immunology. 2010 Dec;126(6):Suppl S1-S58. 6. Diphenhydramine Dosing Table. American Academy of Pediatrics. Accessed 12/4/21.

Prepared by Mohommed Basuf, Pharm.D., and Maria Leibfried, Pharm.D.
The Valley Hospital Pharmacy Department
May 2021. **Updated Dec. 2021**

Flu Shot Peer-Vaccination Program

The Pharmacy Department once again partnered with Valley's Employee Health & Wellness Department as "flu champions" by providing **mini clinics to immunize the pharmacy staff** against flu. This program improves accessibility to flu shots and increases vaccination rates.

Our pharmacist immunizers

Deena Atlas, PharmD, Pharmacist, The Valley Hospital
Aviva Farbowitz, PharmD, Pharmacist, The Valley Hospital
Kerry Fine, PharmD, Pharmacist, The Valley Hospital
Jenn Nacion, PharmD, PGY1 Pharmacy Resident
Michele Pisacane, RPh, Pharmacist-in-Charge, Valley Health Pharmacy Ridgewood
Aarezo Riaz, PharmD, PGY1 Community-Based Pharmacy Resident

Support staff

Ibeth Garcia, BS, MPH, FDU PharmD Candidate
Maria Leibfried, PharmD, BCNSP
Martina Tadros, BS, FDU PharmD Candidate
Erin Tully, BS