PATIENT INFORMATION:  
Recreational Swimming Safety

Waterborne Illness  

Swimming Pools and Treated Water Sites  
Bacteria that cause illness are found in places like swimming pools, hot tubs, and waterparks. Illness from swimming in treated water sites can happen at any time, but may be more common in summer. Swimming pools and waterparks are very busy during the summer, which can mean more germs and more chances to come in contact with them.

Bacteria in treated water can cause diarrhea, stomachache, fever, and vomiting.

Freshwater Swimming  
Bacteria in freshwater lakes are often different than those found in swimming pools. Illness from freshwater swimming usually happens between June and August. The chances of getting sick are lower in freshwater swimming sites, but it can still happen, especially where the water is warm and stable. If you become sick, then let your doctor know that you recently went swimming in a freshwater recreation site.

Illness from swimming in freshwater:  
- Cyanobacteria: rash, skin irritation or swelling, skin sores, stomachache, cough, wheezing, fever, headache, eye irritation, ear irritation  
- Leptospirosis (bacteria found in mammals’ urine): fever, headache, muscle aches

Prevention of Waterborne Illness  
Even though pools have disinfectants like chlorine in them, bacteria do not die right away. Therefore, everyone should take steps to keep from getting sick and from getting others sick.  
- Avoid getting water in your mouth, since only a small amount can make you sick.  
- Take bathroom breaks often, and avoid swimming when you have diarrhea to prevent germs and waste from getting in the water.  
- Check the chlorine levels and pH of pools you swim in. Test strips can be found at many stores. The chlorine level should be 1-3 mg/L, and the goal pH is 7.2-7.8.  
- Rinse your body before and after swimming.  
- Wash your hands well before eating after touching the water.

Drowning Risks and Prevention  
Drowning accidents can occur in both freshwater swimming areas and swimming pools. The drowning risks of freshwater sites include:  
- No lifeguard on duty  
- Not knowing when the water becomes too deep to touch the bottom  
- Currents and changing weather

Accidents in the water can have very serious consequences including brain damage and death. Remember, 10 drowning accidents happen every day in the US. There are steps you can take to prevent drowning.  
- Learn to swim, and do not allow others to swim beyond their level.  
- Learn CPR.  
- If there is no lifeguard, then choose an adult to watch young swimmers.  
- Enter freshwater settings feet first and be aware of drop-offs and currents.  
- Fence off backyard swimming pools.

By Jessi Cahoon, PharmD Candidate

References on Page 5
Continuity of Patient Care at Hospital Discharge

Hospital discharge is a very important step in the continuity of patient care. Common problems that lead to issues with continuity of care include:1-3

- patients misunderstanding their medication regimen
- patients not taking medications as prescribed
- poor communication between the hospital, primary care physician, and patient
- delay or failure to fill prescriptions

Discharged patients, who do not understand their new medications or changes in their medications, are at an increased risk of readmission, adverse events, and other medical errors.1-3 Providing patients with proper medication counseling is paramount to increase understanding at discharge to reduce these risks and improve outcomes. Pharmacists should counsel patients by reviewing their reconciled list of medications and expressing the importance of taking their medications. The pharmacist should go over how to properly take the medications, explain why the patient is taking the medications, and encourage the patient and family members to ask questions.1,3

Patients’ medications should be reconciled at hospital admission and discharge.1 Reconciliation of medications will lead to fewer errors and less confusion for doctors and patients. Patients should be given the reconciled list of their medications that includes their new medications, old medications they are to continue taking, and old medications they will no longer be taking. The pharmacist should go over this list with the patient to prevent confusion.1

Patients are often hospitalized without the knowledge of their primary care physician.1 Not realizing that the patient has been hospitalized recently and may have been started on new medications can lead to duplicate therapies, adverse events, drug interactions, or other medication errors. The patient’s primary care physician should be informed of the hospitalization and the plan for discharge and follow-up. Providing the patient’s primary care physician with this information will prevent future errors and confusion.1

Patients often report delays in prescription fills after hospital discharge.1,5 One study found that only 40% of patients filled their prescriptions on the day of their discharge.2 Patients’ delay in filling prescriptions after discharge leads to increased medication errors and readmission rates.1,5 In two studies, patients who delayed filling their prescription for clopidogrel after stent placement were at a greater risk for adverse events, including death and MI.5 The risk for adverse events and readmission increased as the delay in filling prescriptions increased.4,5

Possible solutions for delays in prescription fills:1,5

- providing a sufficient amount of the new medications at discharge, especially antibiotics and cardiovascular medications
- understanding ease of access to a pharmacy for the patient
- understanding the patient’s affordability issues with the medication
- increasing the patient’s understanding of the importance of their medications

With the rise in the importance of continuity of care, every hospital should examine their procedure for hospital discharge and evaluate what improvements need to be made. This article has highlighted a few of the major points that can improve patients’ continuity of care.

By Traven Moulton, PharmD Candidate

REFERENCES:


Cannabinoid Hyperemesis Syndrome

Cannabinoid hyperemesis syndrome (CHS) is associated with long-term cannabis use, both medicinally and recreationally, despite being used for appetite stimulation and to treat nausea. While a relationship between long-term cannabis use and CHS has been identified, the duration or amount of cannabis use that induces CHS is unknown. 

Patients with CHS experience intractable vomiting which waxes and wanes over several months accompanied by hydrophilia, presenting as excessive hot water bathing, and severe abdominal pain. CHS consists of three phases: prodromal, hyperemetic, and recovery. The prodromal phase, characterized by morning nausea and loss of appetite, can last for months to years before patients present with symptoms. In the hyperemetic phase, patients typically experience symptoms for 24-48 hours, during which they spend an excessive amount of time bathing in hot water for symptom resolution. During the recovery phase, patients slowly return to normal eating and bathing patterns over several months, with potential for subsequent relapse following recurrent cannabis use.

A case series identified 98 patients in whom cannabis use was the only identified explanation for their episode of nausea and vomiting. Of these 98 patients, 84 experienced severe abdominal pain in addition to nausea and vomiting, although the type and location varied widely among the patients. Fifty-two patients reported symptomatic relief with hot water bathing, while only five patients reported this practice was not beneficial (no data was available for the other 41 cases). Of the ten patients available for follow-up, six reported complete resolution of episodes of nausea and vomiting after abstaining from cannabis use for 1-3 months.

Another case series identified 44 patients, 42 of whom smoked daily, presenting with CHS after smoking marijuana for an average of 9.8 years. Forty-three of the patients reported symptomatic relief with excessive hot water bathing, while none of the patients treated with anti-emetic medications reported relief.

In a case report, a 43-year-old male experienced symptom relief 2-3 weeks after abstaining from cannabis use. The patient resumed cannabis use and symptoms returned, but the symptoms resolved after discontinuing cannabis use for the second time. The patient reported a four-year history of CHS coupled with a 28-year history of smoking 0.5-1 grams per day.

Proposed criteria for diagnosis include the following: long-term cannabis use on at least a weekly basis, episodes of cyclic vomiting, symptomatic relief with hot water bathing, and resolution of episodes secondary to abstaining from cannabis use. Lack of abnormalities on laboratory tests, substantial weight loss, having normal bowel movements, and the presence of symptoms in the morning has also been associated with CHS, but is not diagnostic.

Administration of intravenous fluids to prevent dehydration is the mainstay of treatment for CHS. To prevent esophageal and stomach injury, proton pump inhibitors are utilized in CHS treatment as well. Antiemetic medications appear to lack efficacy in patients with CHS; however, two case reports demonstrated beneficial antiemetic effects with lorazepam in CHS patients. Patients presenting with severe abdominal pain reported benefit from opioid therapy, but these agents can worsen nausea, thus caution must be used with their administration. Patients should be educated about abstaining from cannabis products for prevention of further episodes. Time to complete resolution of episodes is highly variable, but can take several months.

In the future, CHS may become more prevalent due to the production of more potent cannabinoids, as well as a rise in reported daily users; the number of users increased by 2.2 million between 2006 and 2012. Therefore, the ability to recognize the signs and symptoms and properly diagnose CHS is crucial in reducing unnecessary healthcare costs and providing adequate patient care.

By Lauren Stauffer, PharmD Candidate

References on Page 5
What is norovirus?
Norovirus, commonly referred to as the stomach flu, is the most common stomach bug in the United States.

Norovirus causes 58% of food poisoning cases in the United States each year. There is an estimated 19-21 million cases of norovirus in the United States each year, costing about $2 billion.

After being infected, it takes 24-48 hours to begin to show symptoms of norovirus.

If norovirus is the stomach flu, does the flu vaccine protect me?
No, the vaccine covers only influenza, which is a respiratory illness not a stomach bug.

How do I get norovirus?
The most common sources of norovirus include:
- uncooked or improperly prepared food
- surfaces that come in contact with food and sick people
- other people who have been exposed to norovirus

How can I prevent norovirus?
- Cook all food properly especially fruits, vegetables, and seafood.
- Wash hands multiple times throughout the day.
- Clean any surfaces that come in contact with uncooked food or sick people.

Symptoms of norovirus:
Symptoms of norovirus last for 1-3 days and include:
- stomach pain
- nausea and vomiting
- diarrhea
- fever
- body aches
- headache

Risk Factors for norovirus
- Living with children who go to daycare
- Living in crowded areas such as in nursing homes, on cruise ships, or in hotels
- Having a weak immune system

What to do if you think you have norovirus?
Norovirus cannot be treated with antibiotics. Go to your doctor if symptoms last longer than 3 days or if you become dehydrated.

Signs of dehydration include:
- dry mouth
- decrease need to go to the bathroom
- dizzy feeling when standing up

Can I go to work after I start feeling better?
Because you may still be contagious, you should stay home from school and work for three days after symptoms go away.

For more information, visit the Centers for Disease Control and Prevention Web site at http://www.cdc.gov.

By Lauren Stauffer, PharmD Candidate

REFERENCES:


Swimming Safety References (cont. from page 1)


MTM (cont. from page 7)


Hypervitaminosis D

Vitamin D plays an essential role in calcium homeostasis and bone mineral metabolism, especially for fracture prevention, and routine vitamin D supplementation is recommended in the majority of patients. Vitamin D maintenance therapy with a dosing range of 800 IU to 1200 IU daily is considered safe and effective for maintaining adequate vitamin D serum levels in healthy individuals regardless of sun exposure and fortified foods. The recommended vitamin D level in adult patients is 30 to 50 ng/mL, and the upper limit of normal is 100 ng/mL. Levels consistently over 150 to 200 ng/mL are potentially toxic and can lead to hypervitaminosis D. Monitoring vitamin D levels is expensive for the patient and cannot be justified as follow-up on a regular basis. High doses of vitamin D to correct or prevent deficiency should be avoided.

Vitamin D toxicity occurs primarily from over-supplementation rather than fortified foods and sun exposure. Supplementation of greater than 10,000 IU per day, which is the upper limit of tolerability, can lead to toxic levels within 3 to 4 months. Hypervitaminosis D is rare and takes several weeks to months to develop. Hypervitaminosis D causes hypercalcemia which leads to soft tissue calcification as well as renal and cardiovascular damage. Symptoms of hypervitaminosis D include nausea, vomiting, constipation, fatigue, and weight loss.

Over-supplementation with vitamin D-containing foods may lead to toxicity, although the occurrence is extremely rare. Although low to moderate levels of UV light exposure from the sun stimulates vitamin D synthesis, there are no known cases of prolonged sun exposure leading to vitamin D toxicity. Intense and prolonged sun exposure can destroy vitamin D in the skin.

Foods that naturally contain vitamin D include fatty fish, fish liver oil, and egg yolks. Unlike other counties such as Canada, vitamin D fortification in foods in the United States is voluntary. Milk and margarine are commonly fortified and usually contain 35 to 45 IU per 100 mL and 530 IU per 100 g, respectively.

One review evaluated ten case reports of patients with features of hypercalcemia and found that nine of the patients had an elevated vitamin D serum level (>150 ng/mL) as the primary cause. Other sources of hypercalcemia such as multiple myeloma, renal disease, and hyperparathyroidism were ruled out in all cases. All of the patients had a history of vitamin D supplementation for various indications including osteoporosis, backache, and general weakness. Evidence of renal failure was positive in eight of the patients. Patients were treated with saline diuresis alone or in combination with other therapy such as steroids, bisphosphonates, or calcitonin. Overall, seven patients recovered from the acute renal failure, and five recovered from hypercalcemia.

Although hypervitaminosis D is rare, it is often misdiagnosed as hypercalcemia. Vitamin D supplementation is beneficial for bone health, but information on excessive vitamin D supplementation leading to toxicity is limited. Due to self-medication with OTC vitamin D supplements, education regarding the proper use of vitamin D is recommended to avoid cases of hypervitaminosis D.

By Levi Shypkowski, PharmD Candidate

References on Page 5
PATIENT INFORMATION:
Medication Therapy Management

What is Medication Therapy Management?
Medication therapy management (MTM) is a meeting, or meetings, between you and a pharmacist to help you reach your treatment goals. The pharmacist will review all of your prescription and nonprescription medications, supplements, and herbal or natural products.

Why is MTM helpful?
Over the course of one year, MTM services have been shown to improve clinical outcomes, reduce the risk of side effects, and decrease total healthcare costs by more than $3500 dollars per person.

Am I a candidate for MTM?
Anyone who takes prescription or nonprescription medications, supplements, or natural/herbal products can benefit from MTM services. The more medications you take, the more you will benefit from MTM services. The risk for adverse events and other medication errors increases as the number of medications a person is taking increases.

How do I schedule an MTM?
MTM services are provided by pharmacists in many different care settings. Set up an MTM appointment by contacting your local pharmacy or your personal physician. Your pharmacist may provide the MTM or have you meet with a designated MTM pharmacist.

How should I prepare for an MTM?
Let your physician know that you are having an MTM done. For your MTM, you will need to bring your:
- Prescription medications
- Nonprescription medications
- Supplements
- Herbal/natural products
- Health records
- Physician’s contact information
- Any other information you think may be important

What to expect during your MTM
- Every MTM is different and individualized based on the patient. Certain things may not need to be covered for some people while others may need a more comprehensive MTM consultation.
- MTM services can range from 30 minutes to 2 hours in length.
- The pharmacist will go over your medications with you, checking for interactions, proper dosing, and any side effects.
- The pharmacist may take your blood pressure or perform other important tests depending on your health, your medications, and your illnesses.
- The pharmacist will outline solutions for any problems with your current medicines and create a plan for any changes that need to be made.
- The pharmacist will create a personal medication record (PMR) for you.
- The PMR will include everything you are taking and will have instructions on proper dose, how and when to take each item, and other information about your medications.
- The pharmacist will contact your primary care physician if any problems are found and if any changes are needed.
- The pharmacist may refer you to your physician or another healthcare professional if necessary.
- Future appointments may be scheduled based on your medication-related needs.

By Traven Moulton, PharmD Candidate

REFERENCES:
3. Isetts BJ, Schondelmeyer SW, Artz MB, et al. Clinical and economic outcomes of medication therapy man-

References continued on Page 5