



THIS MONTH'S CONTENTS

SUMMER SAFETY:

- ◆ RECREATIONAL WATER ILLNESSES (PG 1-2)
- ◆ SUNSCREEN SAFETY (PG 3)

UPDATES IN PEDIATRICS:

- ◆ SURFAXIN FOR RESPIRATORY DISTRESS SYNDROME

KID'S CORNER (PG 5)

RECREATIONAL WATER ILLNESSES (RWIs)

WRITTEN BY: KACY L. MULLIGAN, PHARMD CANDIDATE 2013

Recreational water illnesses are infections caused by contaminated water of swimming pools, hot tubs, lakes, rivers, fountains, or even water play areas. The germs that cause these illnesses are spread most often by swallowing water, however can also spread by inhalation of the aerosolized particles or even just contact with contaminated water. People who are at highest risk of contracting RWIs are young children, elderly, pregnant women, or those with weakened immune systems. Some of the most common RWIs are “*Crypto*,” *Legionella*, swimmer’s ear, and hot tub rash. Unfortunately, chlorinated water does not eliminate the risk of infection. In fact, it can take up to 11 days for chlorine to kill some of these infectious organisms.¹

“*Crypto*,” *Cryptosporidium* is a protozoan parasite that primarily attacks the host’s gastrointestinal tract causing severe diarrhea. *Crypto* is spread through ingestion of feces particles, particularly in the water. It is resistant to most effective concentrations of chlorine, and can take up to 11 days in chlorinated water to disinfect. Diarrhea is usually self-limiting, and can last up to two weeks.¹ Persistent diarrhea may lead to dehydration, malabsorption syndrome, cholecystitis, and even pancreatitis. Treatment of *Crypto* is primarily supportive. Fluid and electrolyte replacement therapy is appropriate due to losses from diarrhea. There is no pharmacological therapy that is consistently effective to eradicate the parasite, however the broad-spectrum antiparasitic drug Nitazoxanide is approved for use in immunocompromised patients. Over-the-counter antidiarrheals can be used for symptomatic treatment of the diarrhea in mild to moderate cases. Antiretroviral agents are recommended for use in HIV patients due to their antidiarrheal effects.²

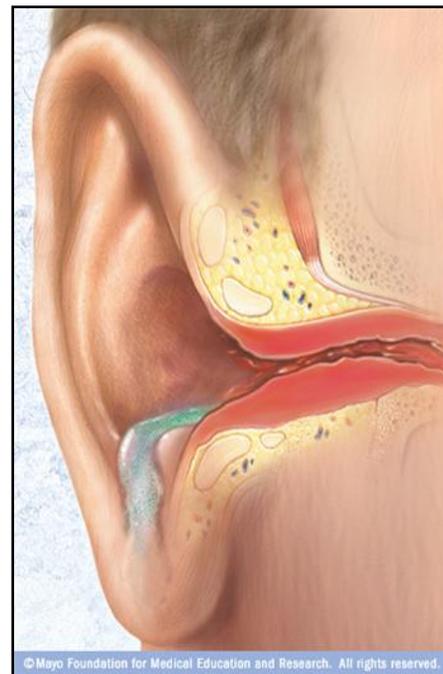
Legionella: *Legionella pneumophila* is a gram-negative bacillus that is naturally found in aquatic environments, especially warm water, and soil. It cannot be spread from person to person, but is spread by inhalation of aerosolized particles of contaminated water. This most commonly happens by breathing in the steam from a hot tub. It is important to make sure hot tubs are properly and regularly cleaned before using. Hot temperatures do not kill *Legionella*, so it is critical to make sure the chlorine, bromine, and pH levels are appropriate.¹ The most common complication from *Legionella* is Legionnaires’ disease, a severe type of pneumonia that can lead to death if not treated promptly. Pharmacologic therapy includes a respiratory fluoroquinolone (moxifloxacin, gemifloxacin, or levofloxacin) or azithromycin for 10 to 21 days. Nonpharmacologic treatment includes airway support, antipyretics, and fluid management.³

Promoting safe and effective pediatric medication therapy through advocacy, education & volunteerism.

It can take up to 11 days for chlorine to kill [some] infectious

RECREATIONAL WATER ILLNESSES, CONT.

Swimmer's Ear: Swimmer's ear is an infection of the outer ear canal that is caused by water collecting in the canal, causing irritation, and thus promoting bacterial growth. Symptoms of swimmer's ear include itching, redness, swelling, pain, or pus draining from the inner ear. If you can tug the outer ear *without* pain, it is most likely a middle ear infection as opposed to swimmer's ear.¹ To prevent infection, earplugs or shower caps are effective barrier methods. To remove water after swimming or bathing, use a towel or hair dryer to gently dry the ear. Never place Q-tips or fingers inside the ear.⁴ There is nothing over-the-counter to *treat* swimmer's ear.



Over-the-counter products such as AURO-DRI® only contain drying aids (alcohol) to help *prevent* infection. If pain lasts more than 3 days, prescription eardrops containing acidic solution, a steroid, or an antibiotic should be used. These may include Polymyxin B Sulfate, ofloxacin, or VoSol® otic solution.⁵

Hot Tub Rash: Hot tub rash, or dermatitis, often occurs after exposure to contaminated hot tub or swimming pool water for an extended period of time. The most common irritant is *Pseudomonas aeruginosa*. Symptoms include red, bumpy, itchy spots that are worse along bathing suit lines. The bumps can progress into blisters around hair follicles that may be filled with pus. The rash may appear within minutes to days of exposure and usually resolves within a week without any pharmacological treatment.¹ Over-the-counter anti-itch treatment, such as hydrocortisone cream or 1% acetic acid soaks, is recommended to help with mild discomfort. If the rash persists longer than a week, physician referral is necessary and oral ciprofloxacin may be prescribed.⁶ It is recommended to limit the amount of time spent in hot tubs, disinfect the water regularly, and to promptly change out of bathing suits following use.

References

1. CDC. Recreational Water Illnesses. Atlanta: , 2011. Web. <<http://www.cdc.gov/healthywater/swimming/rwi/>>.
2. "Cryptosporidiosis." DISEASEDEX™. Micromedex®. Web. 15 Apr 2012. <http://www.thomsonhc.com/micromedex2/librarian/ND_T/evidenceexpert/ND_PR/evidenceexpert/CS/6AA974/ND_AppProduct/evidenceexpert/DUPLICATIONSHIELDSYNC/FCDI1E8/ND_PG/evidenceexpert/ND_B/evidenceexpert/ND_P/evidenceexpert/PFActionId/evidenceexpert.IntermediateToDocumentLink?docId=CR3008A&contentSetId=136&title=Cryptosporidiosis&servicesTitle=Cryptosporidiosis>.
3. "Legionella Infection." DISEASEDEX™. Micromedex®. Web. 15 Apr 2012. <[http://www.thomsonhc.com/micromedex2/librarian/ND_T/evidenceexpert/ND_PR/evidenceexpert/CS/D2B7FF/ND_AppProduct/evidenceexpert/DUPLICATIONSHIELDSYNC/6502CD/ND_PG/evidenceexpert/ND_B/evidenceexpert/ND_P/evidenceexpert/PFActionId/evidenceexpert.IntermediateToDocumentLink?docId=CR2920A&contentSetId=136&title=Legionella infection&servicesTitle=Legionella infection](http://www.thomsonhc.com/micromedex2/librarian/ND_T/evidenceexpert/ND_PR/evidenceexpert/CS/D2B7FF/ND_AppProduct/evidenceexpert/DUPLICATIONSHIELDSYNC/6502CD/ND_PG/evidenceexpert/ND_B/evidenceexpert/ND_P/evidenceexpert/PFActionId/evidenceexpert.IntermediateToDocumentLink?docId=CR2920A&contentSetId=136&title=Legionella%20infection&servicesTitle=Legionella%20infection)>.
4. "Swimmer's Ear." MayoClinic. N.p., 2010. Web. 15 Apr 2012. <<http://www.mayoclinic.com/health/swimmers-ear/DS00473/DSECTION=treatments-and-drugs>>.
5. "Otitis Externa." DISEASEDEX™. Micromedex®. Web. 15 Apr 2012. <[http://www.thomsonhc.com/micromedex2/librarian/ND_T/evidenceexpert/ND_PR/evidenceexpert/CS/26DF20/ND_AppProduct/evidenceexpert/DUPLICATIONSHIELDSYNC/9FF375/ND_PG/evidenceexpert/ND_B/evidenceexpert/ND_P/evidenceexpert/PFActionId/evidenceexpert.DisplayClinicalReviewDocument?docId=CP1861A&contentSetId=135&title=Otitis externa&servicesTitle=Otitis externa](http://www.thomsonhc.com/micromedex2/librarian/ND_T/evidenceexpert/ND_PR/evidenceexpert/CS/26DF20/ND_AppProduct/evidenceexpert/DUPLICATIONSHIELDSYNC/9FF375/ND_PG/evidenceexpert/ND_B/evidenceexpert/ND_P/evidenceexpert/PFActionId/evidenceexpert.DisplayClinicalReviewDocument?docId=CP1861A&contentSetId=135&title=Otitis%20externa&servicesTitle=Otitis%20externa)>.
6. "Folliculitis." DISEASEDEX™. Micromedex®. Web. 15 Apr 2012. <http://www.thomsonhc.com/micromedex2/librarian/ND_T/evidenceexpert/ND_PR/evidenceexpert/CS/CBBD77/ND_AppProduct/evidenceexpert/DUPLICATIONSHIELDSYNC/282188/ND_PG/evidenceexpert/ND_B/evidenceexpert/ND_P/evidenceexpert/PFActionId/evidenceexpert.IntermediateToDocumentLink?docId=CR1880A&contentSetId=136&title=Folliculitis&servicesTitle=Folliculitis&topicId=treatmentSection>.

SURVIVING SPRING & SUMMER: MANAGING ALLERGIES & ENSURING SUN SAFETY

WRITTEN BY: LINDSEY ELLIS, PHARMD CANDIDATE 2013

Spring is an exciting and beautiful time of year. Kids are finishing up the school year, families are planning summer vacations, and flowers are blooming. Spring is also allergy season, which is not quite as fun. An estimated 40% of children have allergic rhinitis. Allergic rhinitis is most prevalent in the southern part of the United States. This condition is better known by the collection of its symptoms, mostly in the nose and eyes, which occur when you breathe in something you are allergic to, such as dust, dander, insect venom, or pollen.¹ Symptoms can include itching of eyes, nose, and palate of mouth; burst of repetitive sneezing; profuse watery running nose; nasal congestion; red, irritated eyes; fatigue; irritability; and confusion.² There are many different medications that can be used for relief from these symptoms, but antihistamines and nasal corticosteroid sprays are the most common.

Antihistamines relieve symptoms of sneezing, running nose, and itching. There are two different types of oral antihistamines: first generation, which have a side effect of drowsiness and sedation, and second generation which have less drowsiness associated with them. First generation antihistamines are mostly used at nighttime and when sleeping is an option. To note, first generation antihistamines are not recommended for children under the age of six. Second generation antihistamines are better for daytime use since they will not interfere with daily activities. Antihistamines also come in the form of eye drops. These are best to use when itchy eyes are the main symptom. Below are two charts showing these different antihistamines. The top chart lists the first generation medications followed by the second generation medications. The second chart lists two different ophthalmic (or eye drop) antihistamines.

Antihistamines ³	Children 2 -5 years old Dose	Children 6 -12 years old Dose
Bromphenir amine Maleate (JTan PD)	Not recommended for children less than 6 years old	2 mg (2mL) every 4-6 hours (max daily dose of 12 mg)
Chlorpheniramine Maleate (Chlorphen)	Not recommended for children less than 6 years old	2 mg every 4 -6 hours (max daily dose of 12 mg)
Diphenhydramine HCl (Benadryl)	Not recommended for children less than 6 years old	12.5-25 mg every 4-6 hours (max daily dose of 150 mg)
	Children 2 -5 years old Dose	Children 6 -11 years old Dose
Cetirizine (Zyrtec)	2.5 mg or 5 mg once daily or 2.5 mg twice daily	5 or 10 mg once daily
Loratadine (Claritin)	5 mg once daily	10 mg once daily
Fexofenadine (Allegra)	30 mg every 12 hours (max daily dose of 60 mg)	30 mg every 12 hours (max daily dose of 60 mg)

Ophthalmic Antihistamines ³	Doses
Pheniramine/ Naphazoline (Opcon-A, Visine-A)	6 years old and older: 1-2 drops into affected eye up to 4 times daily
Ketotifen	3 years old and older: 1 drop into affected eye twice daily every 8-12 hours

Promoting safe and effective pediatric medication therapy through advocacy, education & volunteerism.

Allergic rhinitis is most prevalent in the southern part of the United States.

SURVIVING SPRING & SUMMER, (CONT.)

Additionally, Corticosteroid nasal sprays work by reducing swelling and mucus in the nose.⁴ They also can help to relieve some other bothersome nasal symptoms. If your child’s allergy symptoms include congestion, runny nose, sneezing, itching, or swelling of the nose then these sprays could be beneficial in reducing symptoms. Unlike the antihistamines mentioned earlier, these medications require a prescription from your doctor. These medications also require more time (may take up to two weeks) for symptoms to resolve and show best results when used on a daily basis during allergy season. The chart below lists two of the most common corticosteroid nasal sprays.

Corticosteroid Nasal Sprays ³	Doses
Nasonex	2-11 years old: 1 spray in each nostril once daily
Flonase	4 years and older: 1 spray in each nostril once daily (max 2 sprays in each nostril daily)

In addition to the medications listed above avoiding things that trigger allergies can also help with symptoms.² These things may include, but are not limited to, house-dust mites, pollen, molds, pet dander, cockroaches, and plants. HEPA filters can be used in homes to remove pollen, mold spores, and pet allergens from the air. They do not remove house-dust mites, which require weekly vacuuming to remove.

Another important thing to be aware of as the weather begins to warm up is sun protection. The sun gives off harmful rays called UVA and UVB rays. These both can cause sunburns, premature aging, and skin cancer.⁵ It is important to keep children younger than 6 months out of the sun. For older children sunscreen should be used when outside.

There are a few important details to check for when choosing and applying sunscreen. The first step is to look at SPF. SPF 15-50 can reduce risks of sunburn, skin cancer, and early aging. SPF 40 covers 97.5% of the sun's UVA rays. After choosing an SPF 15 or greater you should check for the spectrum of the sunscreen. It is best to use sunscreen that is broad spectrum. This type will protect against UVA in addition to UVB rays. Finally when using sunscreen apply it liberally to all exposed areas 15 minutes before sun exposure and reapply at least every 2 hours. If your child is in water or sweating it should be reapplied more often. It should also be reapplied immediately after each towel drying.

As the weather warms up it is important for children to enjoy playing outside. The use of sunscreen, allergy medications and non-pharmacological habits can help your children enjoy the nice weather and fun activities that come with the spring season without the discomfort sunburn or allergies.

References:

1. . "MedLine Plus: Trusted Health Information for You." *Allergic Rhinitis*. U.S. National Library of Medicine, 21 3 2012. Web. 18 Apr 2012. <http://www.nlm.nih.gov/medlineplus/ency/article/000813.htm>
2. Krinsky, Daniel L. , Rosemary R. Berardi, et al. *Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care*. 17th. Washington, DC: American Pharmacists Association, 2012. 180-198. Print.
3. Lexi-Comp Online, Pediatric Lexi-Drugs Online, Hudson, Ohio: Lexi-Comp, Inc.; 2012, 18 April 2012.
4. . "MedLine Plus: Trusted Health Information for You." *Nasal Corticosteroid Sprays*. U.S. National Library of Medicine, 21 3 2012. Web. 18 Apr 2012. <<http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000404.htm>>.
5. Krinsky, Daniel L. , Rosemary R. Berardi, et al. *Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care*. 17th. Washington, DC: American Pharmacists Association, 2012. 707-722. Print.

Promoting safe and effective pediatric medication therapy through advocacy, education & volunteerism.

Both UVA and UVB rays can cause sunburns, premature aging, and skin cancer.

UPDATES IN PEDI ATRICS

SURFAXIN®: THE FUTURE OF RESPIRATORY DISTRESS SYNDROME TREATMENT

WRITTEN BY: SHREENA PATEL AND LINDSEY WHITWORTH, PHARM. D. CANDIDATES 2013

Promoting safe and effective pediatric medication therapy through advocacy, education & volunteerism.

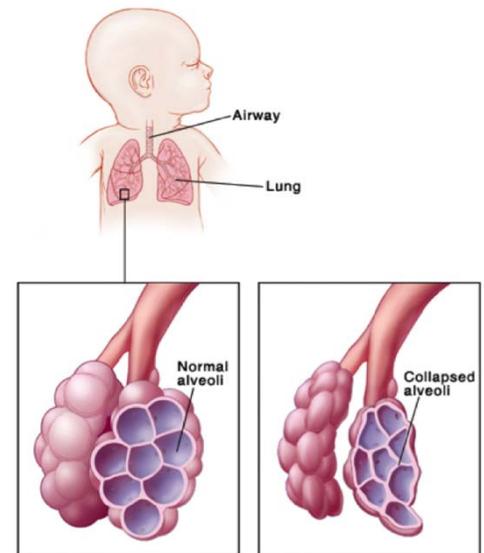
If left untreated, RDS can cause complications such as pulmonary hemorrhage, hypertension, failure to thrive, and in severe

Respiratory distress syndrome (RDS) is a condition characterized by disordered breathing. RDS commonly occurs in neonates, with the highest rates occurring in babies delivered at 28 weeks gestation or less. In addition to premature birth, decreased perfusion to the baby during labor or presence of diabetes in the mother, also pose as risks for developing RDS¹. The correlation between RDS and prematurity exists due to the inability of the neonate's lungs to produce a protective substance known as surfactant. In the absence of surfactant, surface tension builds and results in alveolar collapse, which leads to poor oxygenation; therefore, most neonates with RDS will present with labored breathing, hypoxemia and respiratory acidosis within hours after birth¹.

If left untreated, RDS can cause complications such as pulmonary hemorrhage, hypertension, failure to thrive, and in severe cases, death¹.

Several treatment options are available for RDS, including: mechanical ventilation, continuous positive airway pressure machine (CPAP), oxygen therapy, or exogenous surfactant administration¹. These treatments serve to promote lung inflation, thereby increasing oxygen supply to the neonate. Additionally, prophylactic therapy may be administered to mothers of high-risk infants; prophylaxis includes corticosteroids, which serve to increase surfactant secretion and promote pulmonary maturation in the fetus¹. While a defined standard of care for RDS does not exist, the American Academy of Pediatrics recognizes that use of exogenous surfactant replacement therapy has a positive impact on morbidity and mortality associated with RDS³. Currently both synthetic and animal-derived forms of surfactant are available on the market. Colfosceril (Exosurf®) is an example of a synthetic surfactant; however, it is no longer marketed in the United States. Examples of natural surfactants include: beractant (Survanta®), poractant alpha (Curosurf®), and calfactant (Infasurf®).

Synthetic forms contain phospholipids while natural forms contain phospholipids along with surfactant proteins (SP). SPs play a critical role in reducing alveolar surface tension, as they allow the surfactant to spread evenly along the air-liquid interface and maintain surfactant stability⁴.



www.mounnityny.org/assets/image

SURFAXIN: THE FUTURE OF RESPIRATORY DISTRESS SYNDROME TREATMENT, CONT.

Consequently, the natural forms have shown a quicker onset of action as well as decreased mortality risk when compared with colfosceril⁴. However, the use of natural forms is not without risks; for instance, concerns of infection transmission, immunologic reactions, and inter-lot inconsistency exist.

RDS Signs and Symptoms ^{1,2}
• Cyanosis
• Apnea
• Tachypnea
• Shortness of breath
• Nasal Flare
• Oliguria
• Shallow breathing
• Intercostal retraction
• Grunting sounds while breathing

High Risk Neonates ²
• Sibling with a past history of RDS
• Cesarean delivery
• Meconium aspiration
• Pregnancy involving multiples
• Rapid labor
• Pulmonary infection (i.e. group B streptococcal pneumonia)
• Intrapartum asphyxia

The Food and Drug Administration (FDA) recently approved lucinactant (Surfaxin[®])-a new synthetic surfactant equipped with an SP mimic. In an announcement made on approval day, the FDA cited the results of a single study as the catalyst for their decision⁵. The study, published in *Pediatrics*, is a randomized, multicenter, double blind trial comparing lucinactant with colfosceril and beractant for prevention of RDS in 1,294 preterm babies⁶. The primary endpoints of the study included rates of RDS at 24 hours after birth, and mortality related to RDS at 14 days after birth⁵. Study results show that lucinactant had a significant positive impact on the rate of RDS at 24 hours compared to colfosceril, whereas, comparison with beractant at 24 hours did not show a significant difference in outcome⁶. However, lucinactant showed a significant reduction in mortality related to RDS at 14 days when compared to both colfosceril and beractant⁶.

Like all other surfactant products on the market, lucinactant must be administered through an endotracheal tube; this poses safety concerns, as intubation of premature infants is a risky procedure. Therefore, Discovery Labs advises that only clinicians experienced in intubation and ventilator management utilize the drug⁷.

In an effort to surmount the safety issues associated endotracheal administration, the company has manufactured an aerosolized form of lucinactant (Aerosurf[®]). A phase II trial was recently completed with Aerosurf[®]. The company hopes to begin phase III trials soon.

Resources:

1. "What is Respiratory Distress Syndrome?" *National Heart Lung and Blood Institute*. Department of Health and Human Services. January 24, 2012. Web April 12, 2012.
2. "Neonatal Respiratory Distress Syndrome" *MedlinePlus*. National Institutes of Health. May 9, 2011. Web April 12, 2012.
3. Lemons, James A., et. al. "Surfactant Replacement Therapy for Respiratory Distress Syndrome." *Pediatrics* 103.3 (1999): 684-685. Web Apr. 10, 2012
4. Donn, Steven M., and Sunil K. Sinha. *Pulmonary Surfactant Use in Pre-Term Infant-An Update*. Publication. Touch Briefings, 2008.
5. Food and Drug Administration. Department of Health and Human Services. *FDA Approves Surfaxin to Prevent Breathing Disorder in Premature Infants*. FDA. 06 Mar. 2012. Web. 12 Apr. 2012.
6. Moya, Fernando R., et. al. "A Multicenter, Randomized, Masked, Comparison Trial of Lucinactant, Colfosceril Palmitate, and Beractant for the Prevention of Respiratory Distress Syndrome Among Very Preterm Infants." *Pediatrics* 115.4 (2005): 1018-029. Web. 14 Apr. 2012.
7. "Discovery Labs." *Discovery Labs*. Web. 14 Apr. 2012. <<http://www.discoverylabs.com/surfaxin.php>>.

CELEBRATING SPRING AND SUMMER FUN!

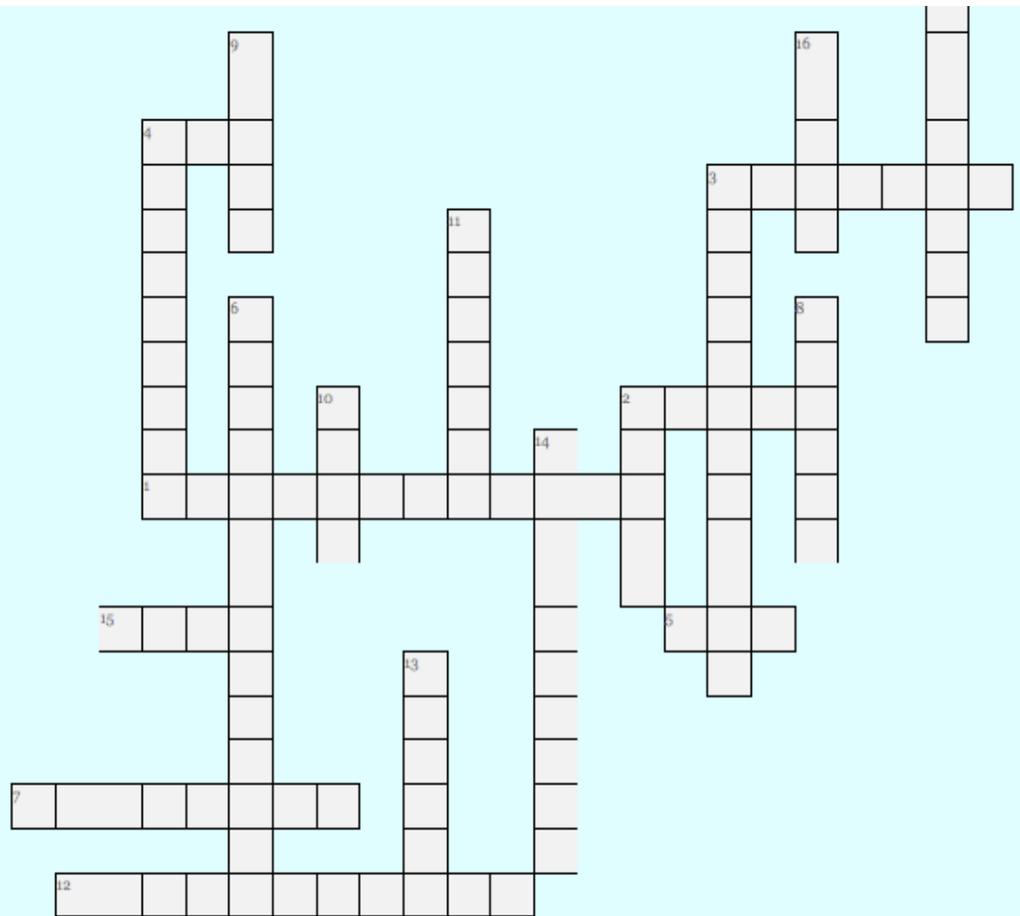
STUDENT
SOCIETY OF
PEDIATRIC
ADVOCATES

*Promoting
safe and
effective
pediatric
medication
therapy
through
advocacy,
education &
volunteerism.*

CHECK OUT THE
SSPA FACEBOOK
PAGE!

[HTTP://WWW.FACE
BOOK.COM/#!/STUD
ENTSOCIETYOFPE
DIATRICADVOCATESUGA](http://www.facebook.com/#!/Studentsocietyofpediatricadvocatesuga)

E-MAIL:
SSPAUGA@GMAIL.COM



Horizontal:

1. an infection of the outer ear canal caused by water collecting there
2. _____% of children suffer from allergic rhinitis
3. OTC products such as AURO-DRI contain _____
4. Apply sunscreen at least every ___ hours
5. Keep children younger than ___ months out of the sun
7. Sun safety is important for _____
12. Hot tub rash is commonly caused by _____
15. infections caused by contaminated water

Vertical:

2. _____ generation antihistamines are not approved in children under age of 6
3. Macrolide treatment for Legionella
4. Steroid nasal sprays may take up to _____ to start working
6. _____ nasal sprays work by reducing swelling and mucus in the nose
8. a protozoan parasite causing diarrhea
9. It is best to use a _____ spectrum sunscreen
10. SSPA's favorite summer volunteer event
11. April showers bring May _____
13. A common allergen trigger
14. gram-negative bacillus naturally found in aquatic environments
16. In like a lion, out like a lamb
17. a yellow flower that faces the sun