



**IN THIS ISSUE....**

**UPDATES IN PEDIATRICS:**

- ◆ COMMUNITY ACQUIRED PNEUMONIA GUIDELINES (P. 1)
- ◆ PEDIATRIC DOSING OF IBUPROFEN (P. 2)
- ◆ NEW DRUG APPROVED FOR LENNOX-GASTAUT SYNDROME (P. 4)

OFFICIAL NEWSLETTER OF THE STUDENT SOCIETY OF PEDIATRIC ADVOCATES

## GUIDELINES FOR COMMUNITY ACQUIRED PNEUMONIA<sup>1</sup>

KAYLEIGH MARX, PHARM.D. CANDIDATE 2012, ASHLEY H. CRIBB, PHARM.D. CANDIDATE, 2012

On August 30<sup>th</sup>, 2011, the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America published the first ever, evidence-based guidelines for the management of community-acquired pneumonia in pediatrics. These guidelines were created with a goal of reducing morbidity and mortality in this population and are an excellent resource for healthcare providers in multiple settings.

### Empiric Therapy for Pediatric Community-Acquired Pneumonia (CAP)<sup>a</sup>

| Site of Care                          | Presumed Bacterial Pneumonia                                                                                                                                                                                                                                                                                           | Presumed Atypical Pneumonia                                                                                                                                                                                            | Presumed Influenza Pneumonia                                                                                                                                                   |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outpatient                            | <p>&lt; 5 years old (preschool)</p> <p><b>DOC:</b><br/>Amoxicillin<sup>b</sup></p> <p><b>Alternative:</b><br/>Amoxicillin clavulanate</p>                                                                                                                                                                              | <p><b>DOC:</b><br/>Azithromycin</p> <p><b>Alternatives:</b><br/>Clarithromycin or Erythromycin</p>                                                                                                                     | <p>Oseteltamivir</p>                                                                                                                                                           |
|                                       | <p>≥ 5 years old</p> <p><b>DOC:</b><br/>Amoxicillin<sup>b</sup></p> <p><b>Alternative:</b><br/>Amoxicillin clavulanate</p>                                                                                                                                                                                             | <p><b>DOC:</b> Azithromycin</p> <p><b>Alternative:</b><br/>Clarithromycin Erythromycin Doxycycline for children &gt; 7 years</p>                                                                                       | <p><b>DOC:</b> Oseteltamivir or zanamivir (&gt; 7 years old)</p> <p><b>Alternatives:</b><br/>IV peramivir, IV oseteltamivir IV zanamivir (available for compassionate use)</p> |
| Inpatient <sup>d</sup> (for all ages) | <p><b>Fully immunized</b> with conjugate vaccines for <i>Haemophilus influenzae</i> type b and <i>Streptococcus pneumoniae</i>; local penicillin resistance in invasive strains of pneumococcus is minimal</p> <p><b>DOC:</b> Ampicillin or penicillin G</p> <p><b>Alternatives:</b><br/>ceftriaxone or cefotaxime</p> | <p><b>DOC:</b> Azithromycin (in addition to B-lactam, if diagnosis of atypical pneumonia is in doubt)</p> <p><b>Alternatives:</b><br/>clarithromycin erythromycin doxycycline (&gt;7 yrs) levofloxacin<sup>c</sup></p> | <p>As above</p>                                                                                                                                                                |
|                                       | <p><b>Not fully immunized</b> for <i>H. influenzae</i> type b and <i>S. pneumoniae</i>; local penicillin resistance in invasive strains of pneumococcus is significant</p> <p><b>DOC:</b> Ceftriaxone or cefotaxime</p> <p><b>Alternatives:</b><br/>Levofloxacin</p>                                                   | <p>As above</p>                                                                                                                                                                                                        | <p>As above</p>                                                                                                                                                                |

A: DOES NOT INCLUDE MANAGEMENT OF NEONATES AND YOUNG INFANTS THROUGH THE FIRST 3 MONTHS, IMMUNOCOMPROMISED CHILDREN, CHILDREN RECEIVING HOME MECHANICAL VENTILATION, AND CHILDREN WITH CHRONIC CONDITIONS OR UNDERLYING LUNG DISEASE (SUCH AS CF).  
 B: TWICE DAILY DOSING OF AMOXICILLIN OR AMOXICILLIN CLAVULANATE MAY BE EFFECTIVE FOR PNEUMOCOCCI THAT ARE SUSCEPTIBLE TO PENICILLIN.  
 C: FOR CHILDREN WHO HAVE REACHED GROWTH MATURITY OR WHO CANNOT TOLERATE MACROLIDES  
 D: ADDITION OF VANCOMYCIN OR CLINDAMYCIN FOR SUSPECTED CA-MRSA IS PERMITTED

*Streptococcus pneumoniae* is the most common pathogen responsible for pediatric CAP. Other pathogens include Group A *Streptococcus* and *Haemophilus influenzae*.



Guidelines for the management of CAP are not only a useful tool for clinicians in both the inpatient and outpatient setting; they also provide an excellent opportunity for pharmacists to encourage antibiotic stewardship as we work towards a healthier pediatric community.

1. Bradley JS, Byington CL, Shah SS, Alverson B, Carter ER, Harrison C, Kaplan SL, Mace SE, McCracken GH, Moore MR, St Peter SD, Stockwell JA, Swanson JT. The Management of Community-Acquired Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America, *Clinical Infectious Diseases*, August 30, 2011.

## IBUPROFEN IN PEDIATRICS

KRISTIN ALSPAUGH, PHARM.D. CANDIDATE 2014

Ibuprofen is an affordable, over-the-counter medication that is readily available to the community population. It is available in a number of formulations either by itself or combined with other drugs. Knowledge of indications, warnings/precautions, and dosing is vital to a pharmacist’s ability to effectively counsel their patients about ibuprofen.

### Indications

Ibuprofen is indicated in a variety of conditions including as an anti-inflammatory, analgesic and antipyretic. Most parents find ibuprofen useful in treating their children’s fever, headache, sore throat, sore muscles, sunburn, and toothache. Off-label uses include juvenile rheumatoid arthritis, patent ductus arteriosus and prevention of adverse reactions with DTP vaccination.

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## IBUPROFEN IN PEDIATRICS, CONT.

### Warnings

While ibuprofen is generally considered safe, there are important risks associated with its use (Refer to Table 1).

| Table 1: Ibuprofen Warnings/Precautions |                                                                                                                                                  |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Gastrointestinal                        | <ul style="list-style-type: none"> <li>⌋ Gastric bleeding</li> <li>⌋ Ulceration</li> <li>⌋ Perforation of the stomach or intestines</li> </ul>   |
| Allergic                                | <ul style="list-style-type: none"> <li>⌋ Rash</li> <li>⌋ Urticaria</li> <li>⌋ Pruritus</li> <li>⌋ Facial Swelling</li> <li>⌋ Wheezing</li> </ul> |
| Hematologic                             | <ul style="list-style-type: none"> <li>⌋ Mild inhibition of platelet aggregation</li> </ul>                                                      |
| Renal                                   | <ul style="list-style-type: none"> <li>⌋ Hematuria</li> <li>⌋ Proteinuria</li> <li>⌋ Nephrotic Syndrome</li> </ul>                               |
| Cardiovascular                          | <ul style="list-style-type: none"> <li>⌋ Thrombotic Events</li> <li>⌋ Myocardial Infarction</li> <li>⌋ Stroke</li> </ul>                         |

Parents should be advised to contact their child’s doctor if:

- ◆ Child is under a doctor’s care for any serious condition or is taking any other drug
- ◆ Child does not get any relief from symptoms within the first 24 hours of treatment, or pain or fever gets worse
- ◆ Stomach upset gets worse or lasts
- ◆ Redness or swelling is present in the painful area
- ◆ Sore throat is severe, lasts greater than 2 days or occurs with fever, headache, rash, nausea or vomiting
- ◆ An allergic reaction occurs. Seek medical help immediately.

### Pregnancy

While considering the proper use of ibuprofen in children is important, it is also important to consider unborn children. Pregnant women should be counseled to avoid ibuprofen, especially during the third trimester. Ibuprofen can prematurely constrict or close the ductus arteriosus, which can lead to serious fetal and neonatal complications. These complications include oligohydramnios, hyperbilirubinemia, pulmonary hypertension, necrotizing enterocolitis and intraventricular hemorrhage.

### Dosing

Ibuprofen is available in variety of different concentrations and formulations. As a result, parents should be counseled to pay close attention to the medication labels in order to avoid under or over-utilization. Parents should be advised not to combine other products that contain ibuprofen, aspirin or naproxen sodium. Parents should use the lowest effective dose for the shortest duration consistent with individual treatment goals. Dosing should be based on weight rather than age (Refer to Table 2). Dosage adjustment may be required for patients with renal impairment.

Doses should be evenly divided throughout a 24 hour period and given every 6 to 8 hours, up to 4 times a day. Dosages are:

- 12 years of age and older: 1,200mg in 24 hours
- 6 months to 11 years of age: 30mg/kg in 24 hours

Children 12 and over that can swallow tablets can use ibuprofen tablets instead of the chewable or suspension formulations.

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Table 2: Pediatric Ibuprofen Dosing

| Weight                        | Age         | Dose form             |                        |                             |                          |
|-------------------------------|-------------|-----------------------|------------------------|-----------------------------|--------------------------|
|                               |             | 50 mg chewable tablet | 100 mg chewable tablet | Oral suspension (100mg/5mL) | Oral drops (50mg/1.25mL) |
| 12 to 17 lb (5.5 to 7.7 kg)   | 6 to 11 mo  | Ñ                     | Ñ                      | Ñ                           | 1.25 mL (50 mg)          |
| 18 to 23 lb (8.2 to 10.5 kg)  | 12 to 23 mo | Ñ                     | Ñ                      | Ñ                           | 1.875 mL (75 mg)         |
| 24 to 35 lb (10.9 to 15.9 kg) | 2 to 3 y    | Ñ                     | Ñ                      | 5 mL (100 mg)               | Ñ                        |
| 36 to 47 lb (16.3 to 21.4 kg) | 4 to 5 y    | 3 tablets (150 mg)    | Ñ                      | 7.5 mL (150 mg)             | Ñ                        |
| 48 to 59 lb (21.8 to 26.8 kg) | 6 to 8 y    | 4 tablets (200 mg)    | 2 tablets (200 mg)     | 10 mL (200 mg)              | Ñ                        |
| 60 to 71 lb (27.3 to 32.3 kg) | 9 to 10 y   | 5 tablets (250 mg)    | 2.5 tablets (250 mg)   | 12.5 mL (250 mg)            | Ñ                        |
| 72 to 95 lb (32.7 to 43.2 kg) | 11 y        | 6 tablets (300 mg)    | 3 tablets (300 mg)     | 15 mL (300 mg)              | Ñ                        |

REFERENCES:  
 1. AUER, M. "PRENATAL DIAGNOSIS OF INTRAUTERINE PREMATURE CLOSURE OF THE DUCTUS ARTERIOSUS FOLLOWING MATERNAL DICLOFENAC APPLICATION." *ULTRASOUND OBSTET GYNECOL.* (2004): 513-516. WEB. 20 NOV. 2011. <[HTTP://ONLINELIBRARY.WILEY.COM/DOI/10.1002/UOG.1038/PDF](http://onlinelibrary.wiley.com/doi/10.1002/uog.1038/pdf)>.  
 2. [HTTP://ONLINE.FACTSANDCOMPARISONS.COM/MONODISP.ASPX?MONOID=FANDC\\_HCP12287&QUICK=429136%7C5&SEARCH=429136%7C5&ISSTEMMED=TRUE#FIRSTMATCH](http://online.factsandcomparisons.com/monodisp.aspx?monoid=fandc_hcp12287&quick=429136%7c5&search=429136%7c5&isstemmed=true#firstmatch)

## NEW TREATMENT, ONFI™, APPROVED BY FDA FOR LENNOX-GASTAUT SYNDROME

MORGAN TREPTE PHARM.D. CANDIDATE 2012

Lennox-Gastaut syndrome (LGS) is a type of epilepsy experienced by pediatric patients. The seizures typically start before the age of four. Patients with the syndrome may experience many different types of seizures: tonic, atonic, atypical, and myoclonic. Episodes of the seizures may vary in both length and frequency. Consequences of LGS include abnormal behavior and the impairment of both mental and physical development. Some potential causes of Lennox-Gastaut syndrome are perinatal asphyxia, CNS infections, and head traumas. However, approximately 30% of the time the exact cause cannot be identified.<sup>1</sup>

There currently is no cure for LGS, but treatment focuses on the use of various combinations of anti-epileptic medications such as valproate (Depakene®), lamotrigine (Lamictal®), felbamate (Felbatol®), and topiramate (Topamax®). Over time, different combinations may have to be tried as tolerance can develop or the seizures can become uncontrolled again.<sup>1</sup>

The newest medication to receive FDA approval (on October 21, 2011) for use as adjunctive therapy in patients with Lennox-Gastaut syndrome is Onfi™ (clobazam).

**STUDENT  
SOCIETY OF  
PEDIATRIC  
ADVOCATES**

*UPCOMING EVENTS:*

**NEXT MEETING:  
TUESDAY,  
JANUARY 17<sup>TH</sup> AT  
6:00 PM**

**COME HEAR FROM  
PEDIATRIC  
PHARMACISTS AND  
PHARMACY  
RESIDENTS ABOUT  
THEIR  
EXPERIENCES IN  
CLINICAL  
PRACTICE.**

**UGA DANCE  
MARATHON & MCG  
MIRACLE  
DETAILS TBA**

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COM**

Clobazam is a benzodiazepine that has been used in other countries for over 30 years for the treatment of anxiety and epilepsy. The most commonly reported adverse events associated with the use of clobazam included drowsiness, sedation, and lethargy. Clobazam can be prescribed to children  $\geq 2$  years of age. The daily dose (divided into two doses per day) is weight based and individually titrated based on safety and efficacy.<sup>2</sup> Clobazam comes in 5mg, 10mg, and 20mg tablets that can be given whole or crushed into applesauce.<sup>3</sup>

Concerning drug interactions, clobazam is primarily metabolized in the liver via the CYP450 system (particularly CYP3A4, CYP2C19, and CYP2B6). CYP2C19 is also involved in the metabolism of the primary, active metabolite of clobazam, N-desmethyloclobazam. Additionally, clobazam is an inhibitor of CYP2D6. The half life of clobazam is 36 to 42 hours and the half life of N-desmethyloclobazam is 71 to 82 hours. Dosing adjustments are recommended in the elderly, patients with mild to moderate hepatic impairment, and patients that are known to be poor CYP2C19 metabolizers.<sup>2</sup>

Other warnings/precautions to be aware of with clobazam include a drug interaction with alcohol and the potential to develop withdrawal symptoms with abrupt discontinuation. In the presence of alcohol, the blood levels of clobazam can be increased by approximately 50%. Also, to avoid the development of withdrawal symptoms, the dose of clobazam should slowly be titrated down prior to discontinuation of the medication.<sup>3</sup>

Full prescribing information can be found at:  
[http://www.accessdata.fda.gov/drugsatfda\\_docs/label/2011/202067s000lbl.pdf](http://www.accessdata.fda.gov/drugsatfda_docs/label/2011/202067s000lbl.pdf)

**Table 1. Recommended Total Daily Dosing by Weight Group<sup>3</sup>**

|                 | <b><math>\leq 30</math>kg Body Weight</b> | <b><math>&gt; 30</math>kg Body Weight</b> |
|-----------------|-------------------------------------------|-------------------------------------------|
| Starting Dose   | 5mg                                       | 10mg                                      |
| Starting Day 7  | 10mg                                      | 20mg                                      |
| Starting Day 14 | 20mg                                      | 40mg                                      |

References:

- [1. http://www.ninds.nih.gov/disorders/lennoxgastautsyndrome/lennoxgastautsyndrome.htm](http://www.ninds.nih.gov/disorders/lennoxgastautsyndrome/lennoxgastautsyndrome.htm)
- Ta-Chen Wu, Senior Clinical Pharmacologist, Angela Yuxin Men, Team Leader, Division of Clinical Pharmacology 1, Office of Clinical Pharmacology, Office of Translational Sciences, CDER, FDA. FDA Approval of ONFI™ (clobazam) for Adjunctive Therapy for the Treatment of Seizures Associated with Lennox-Gastaut Syndrome (LGS). ACCP News from the FDA. 2 November 2011.
- [3. http://www.accessdata.fda.gov/drugsatfda\\_docs/label/2011/202067s000lbl.pdf](http://www.accessdata.fda.gov/drugsatfda_docs/label/2011/202067s000lbl.pdf)

## **SSPA IN ACTION!**

STUDENTS FROM SSPA WERE INVOLVED WITH DAWGTOBERFEST IN ATHENS ON OCTOBER 19<sup>TH</sup>, PROMOTING PEDIATRIC WELLNESS THROUGH EDUCATION AND IMMUNIZATION AWARENESS.

STUDENTS ALSO VOLUNTEERED AT THE BARNEY'S COMMUNITY HEALTH FAIR IN AUGUSTA ON NOVEMBER 11<sup>TH</sup>, PROMOTING PEDIATRIC VACCINATION, NUTRITION AND VITAMIN EDUCATION, AND HEALTH AWARENESS.

