

# Wyoming Drug Utilization Review

## Antibiotic Stewardship in Ambulatory Care

Brandon Anderson, PharmD Candidate, May 2015

The health care field is slowly creeping up on a major crisis: the emergence of total antibiotic resistance. Before the development of antibiotics, many people died from infectious disease. Today, almost every pathogen has developed resistance to at least one antibiotic.<sup>1</sup> Antibiotic resistance increases the risk of morbidity and mortality from infectious disease.<sup>2</sup> The World Health Organization has identified bacterial resistance as one of the most serious health issues of our time.<sup>3</sup>

The development of new antibiotics is not keeping up with the pace of evolving bacterial resistance.<sup>4</sup> Is the pendulum starting to swing back toward the pre-antibiotic era because of the rise of antibiotic resistance? There are two options in preventing further antimicrobial resistance: development of new antibiotics and practicing antibiotic stewardship.<sup>5</sup> Antibiotic stewardship has been more prevalent in the hospital setting, while the outpatient setting has been neglected, even though the majority of antibiotics prescribed are in the outpatient setting. The excessive use of antibiotics in ambulatory care has led to an increase of antimicrobial resistance among community-acquired bacterial infections.<sup>6</sup> Antibiotic stewardship is a set of initiatives made by health care organizations to promote the responsible use of antibiotics.<sup>3</sup> One of the goals of these initiatives is to preserve the efficacy

of current antibiotics. One strategy in antibiotic stewardship is reducing the number of unnecessary antibiotics. Another strategy is clinician and patient education. Quality improvement strategies have been shown to reduce antibiotic resistance rates and decreased the prescribing rate of antibiotics by 25%.<sup>6</sup> This article focuses on four disease states where antibiotic stewardship has an impact: sinus infections, otitis media, the common cold, and bronchitis.

One of the biggest variables in antibiotic resistance is antibiotic exposure. The chances of the pathogen mutating so the antibiotic is no longer effective increases with each exposure.<sup>2</sup> Bacteria and other infectious pathogens replicate at a very high rate, and the higher replication rate, the higher chance the pathogen is going to develop resistance.<sup>7</sup> One essential step in prevention is to minimize the unnecessary use of antibiotics.

In a recent publication of the top five activities that should be implemented in the primary care setting to promote better health, the second activity on the list is: “do not routinely prescribe antibiotics for acute mild and moderate sinusitis.”<sup>8</sup> Sinusitis is one of the most common reasons for an office visits.<sup>9</sup> Approximately 20 million cases of sinusitis occur each year in the US, and it accounts for 15-21% of all antibiotics prescribed in the outpatient setting.<sup>9</sup> Sinusitis can be caused by either bacteria or a virus, and distinguishing between the two is challenging.<sup>9</sup> Bacterial sinusitis can be caused by many different organisms including *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis*.<sup>10</sup> However, sinus cavity cultures are positive only two-thirds of the time.<sup>10</sup> Bacterial sinusitis is more likely when the symptoms have lasted for more than one week. Patients with bacterial sinusitis will have a longer duration, more severe symptoms, and abnormal findings on radiographs.<sup>10</sup> The use of antibiotics in acute sinusitis has been well studied and reviewed. The difference in cure rates between placebo and antibiotics was 7-14% higher in the antibiotic group

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in one review.<sup>9</sup> Antibiotic treatment is recommended for acute sinusitis with severe or persistent moderate symptoms.<sup>9</sup> The recommended antibiotic regimen from Infectious Diseases Society of America (IDSA) is amoxicillin-clavulanate 500 mg/ 125 mg three times daily or amoxicillin-clavulanate 875 mg/ 125 mg twice daily for 5 to 7 days.<sup>11</sup> Upper respiratory tract virus infections have similar symptoms to acute sinusitis, but 90% of upper respiratory infections may be caused by viruses and antibiotics will not be effective in treating upper respiratory infection caused by a virus.<sup>9</sup>

The most common infection in which children receive antibiotics is otitis media.<sup>12</sup> The three most common bacteria that cause otitis media are: *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis*.<sup>12</sup> Acute otitis media is most likely a sequelae of a viral upper respiratory tract infection. This infection leads to eustachian tube inflammation or dysfunction and movement of secretions into the ear. Around 66% of otitis media is caused by a combination of bacterial and viral pathogens, 27% attributed to bacteria alone, and 4% attributed to virus alone. Nonsevere infection was defined as the presence of otalgia and a temperature of less than 39°C during the preceding 24 hours.<sup>12</sup> The watchful waiting recommendation was based on the results of clinical trials showing that some children with otitis media improved spontaneously. The AAP guidelines recommend initial observation in patients at least 6 months of age for 48 to 72 hours, and the use of analgesics for patients with uncomplicated otitis media who have not had a prior episode in the past 30 days, and who do not have immunodeficiencies.<sup>13</sup> Spontaneous improvement should be seen within 48 to 72 hours. Antibiotics are indicated in patients who do not improve within 48 to 72 hours, have a complicated infection, or who are immunodeficient.<sup>13</sup> The first-line antibiotic is amoxicillin 80 to 90 mg/kg/day in two divided doses in children two months or older.<sup>13</sup>

Bronchitis accounts for greater than 36 million office visits annually, and is one of the three most commonly diagnosed illnesses in the ambulatory care setting in addition to hypertension and diabetes.<sup>14</sup> Bronchitis is typically viral in origin and is classified as an acute

upper respiratory infection. The common viral etiologies include: influenza A and B, parainfluenza virus, respiratory syncytial virus, coronavirus, adenovirus and rhinovirus. Fewer than 10% of infections are caused by bacteria. Sputum cultures are challenging to obtain, and are not recommended because they are not reliable in guiding treatment strategies. Although viruses are the most common etiology, between 65% and 80% of patients receive antibiotics. Current guidelines recommend against the use of antibiotics in healthy adults with bacterial bronchitis. Pneumonia, which presents similarly to bronchitis but with vital sign abnormalities or asymmetrical lung sounds, should be ruled out before bronchitis is diagnosed. Acute bronchitis is typically self-limiting. The common cold and bronchitis share many characteristics, making the differential diagnosis difficult.<sup>14</sup> The common cold is a viral infection of the upper respiratory tract that is usually self-limiting. Antibiotics are prescribed around 30% of the time, although antibiotics are ineffective.<sup>15</sup> It is the most frequent human illness affecting approximately 25 million people annually in the US.<sup>15</sup>

Antibiotics will not treat viral infections, and prescribing antibiotics during a viral infection leads to an increase in antibiotic resistance rates. Although it may be hard to distinguish viral from bacterial infections, the literature suggests that most of these infections will subside on their own. Antibiotic resistance is on the rise and without the development of new antibiotics, antibiotic stewardship is an option to slow down the rate of antibiotic resistance. Sinusitis, otitis media, the common cold, and bronchitis are all common reasons why patients are seen by physicians and have a role in antibiotic stewardship; reducing the use of antibiotics prescribed because they are typically viral in etiology and subside spontaneously. Without smarter use of current antibiotics, bacterial resistance will catch up with the lack of new antibiotic development and may lead us back to the pre-antibiotic era.

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## P & T Committee Meeting Update

The P&T Committee met for its quarterly business meeting on February 18, 2015.

Highlights of this meeting include:

The RFP for PBM services will be released before the end of March. The current contract ends June 30, 2016.

The retrospective DUR process has been changed to provider-centric reports. It is hoped that this will provide valuable data to prescribers while decreasing the volume of letters received from the DUR program.

Butrans patches will be limited to a maximum 20 mcg/hour due to the potential for QTc changes at higher doses.

Esbriet, Ofev, Akynzeo and Viekira will be limited to their approved indications. In addition, the clinical

criteria for the Hepatitis C class will be applied to Viekira.

Lemtrada, Belsomra, and Hysingla will be non-preferred in their respective classes.

Afrezza will require prior authorization and requests will be reviewed on a case by case basis.

The proposed prior authorization criteria will be posted for public comment at [www.uwyo.edu/DUR](http://www.uwyo.edu/DUR). Comments may be sent by email to [alewis13@uwyo.edu](mailto:alewis13@uwyo.edu) or by mail to: Wyoming Drug Utilization Review Board, Dept. 3375, 1000 E. University Avenue, Laramie, WY 82071. Comments should be received prior to March 31, 2015 for prior authorization criteria.

The next P&T Committee meeting will be held May 14, 2015 in Cheyenne. An agenda will be posted approximately two weeks prior to the meeting.

### References

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### 2015 P & T Committee Meeting Dates

**Thursday, May 14, 2015**

**Thursday, August 13, 2015**

**Thursday, November 12, 2015**

Meetings are held at Laramie County Community College, 10 am - 1 pm. Room number and agenda will be posted approximately 2 weeks before meeting date on our website: [www.uwyo.edu/DUR](http://www.uwyo.edu/DUR).

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