Volume 1, Issue 3

SUMMER 2006

GET SMART COLORADO
USE ANTIBIOTICS WISELY

Provider Newsletter

A resource for Colorado health care providers about antibiotic resistance and efforts to promote the judicious use of antibiotics throughout the state.

Vaccines and Antibiotic Use

Newsletter topics are determined by Get Smart Colorado coalition partners. In this 'Back to School' issue, partners chose to focus articles on vaccines and influenza.

Vaccines and antibiotics are powerhouses in the prevention and treatment of disease. Their use or nonuse also affects antibiotic resistance. In fact, a federal Interagency Task Force declared preventing infection through the improved use of vaccines a top priority action item to combat antimicrobial resistance. In this issue, we'll take a look at some of what's new in the vaccine world as well as vaccines' role in affecting antibiotic resistance.

If you have topic suggestions for future newsletters, please let us know by email, getsmartcolorado@state.co.us or phone, 303-692-2459.

Effect of Pneumococcal Vaccine on Antibiotic Resistance—An article review

By Deb Aragon

The April 6, 2006 (Vol. 354, No. 14) issue of The New England Journal of Medicine published an article entitled '*Effect of Introduction of the Pneumococcal Conjugate Vaccine on Drug-Resistant Streptococcus pneumoniae.*' In this article, the authors examined the effect of the pneumococcal vaccine on invasive disease caused by resistant strains.

The authors used laboratory-based data from the Centers for Disease Control and Prevention's Active Bacterial Core surveillance program (of which, Colorado is a part, although Colorado data were not included in this study) to measure disease rates caused by antibiotic-nonsusceptible pneumococci from 1996 through 2004. Invasive disease was defined as disease caused by pneumococci isolated from a normally sterile site. Isolates were serotyped and tested for susceptibility.

The 7-valent pneumococcal conjugate vaccine was introduced for infants in the United States in 2000 and included seven serotypes, five of which were responsible for most penicillin-resistant infections. Rates of resistant disease caused by these serotypes fell 87% between 1999 and 2004. Interestingly, an increase was seen in disease caused by serotype 19A, one that is not included in the vaccine.

Further findings from the study include:

- Rates of invasive disease caused by penicillin-nonsusceptible strains and strains not susceptible to multiple antibiotics peaked in 1999 and decreased by 2004;
- Rates of invasive disease caused by penicillin-nonsusceptible strains decreased from 6.3 to 2.7 cases per 100,000, a decline of 57% [95% confidence interval (CI): 55-58%];
- Rates of disease caused by strains not susceptible to multiple antibiotics decreased from 4.1 to 1.7 cases per 100,000, a drop of 59% (95% CI: 58-60%).

With respect to our most vulnerable populations, the study found that:

- Among children under two years of age, invasive disease caused by penicillin-nonsusceptible strains decreased by 81% (95% CI: 80-82%);
- Among those persons aged 65 years and older, invasive disease caused by penicillin-nonsusceptible strains decreased by almost 50%, from 16.4 to 8.4 cases

(Continued on page 2)

Inside this issue:

By reading this issue, you will:

- *Understand the effect the pneumococcal vaccine has had on* Streptococcus pneumoniae *resistance.*
- *Learn the new influenza vaccination recommendations for children and their caregivers.*
- *Learn the role of sentinel providers in influenza surveillance.*

Effect of Pneumoccal Vaccine (continued)

per 100,000. This is thought not to be a result of the 23-valent polysaccharide vaccine for this older age group, as no reduction was found in resistant disease caused by the serotypes included in the polysaccharide vaccine. Rather, the decrease was due to a reduction in disease caused by the 7-valent conjugate vaccine serotypes, which suggests the vaccine interrupts the transmission of resistant pneumococci from children to adults.

These findings are very important to the issue of antibiotic resistance. The 7-valent pneumococcal conjugate vaccine is effective in reducing the incidence of invasive disease and appears to play a role in the reduction of resistant strains. This study also shows that vaccination benefits persons beyond just those getting the vaccine.

Web-based continuing education credits based on the NEJM article are available from MedPage Today at www.medpagetoday.com/InfectiousDisease/Pneumonia/tb/3008.

Citation:

Kyaw MH, Lynfield R, Schaffner W, et al. Effect of introduction of the pneumococcal conjugate vaccine on drug-resistant Streptococcus pneumoniae. N Engl J Med. 2006 Apr 6; 354(14): 1455-63.

Children Need Flu Vaccine, Too

Roberta Smith, MSPH

In June 2006, the Advisory Committee on Immunization Practices (ACIP) extended its recommendations on who should be vaccinated against influenza to include children 24 to 59 months of age as well as the household contacts and out of home caregivers of these children. The following is information on the current recommendations for children.

Why vaccinate children against influenza?

The risk for complications and hospitalizations from influenza are higher among persons 65 years of age and older, young children, and persons of any age with certain underlying medical conditions. Among children 0-4 years of age, hospitalization rates have varied from 100 per 100,000 for healthy children to as high as 500 per 100,000 for children with underlying medical conditions. Fortunately, deaths from influenza are uncommon among children both with and without high-risk conditions, but they do occur. A study that modeled influenza-related deaths estimate that an average of 92 deaths (0.4 deaths per 100,000) occurred among children ages <5 years annually during the 1990's. This is much lower than the estimated 32,651 deaths annually among adults aged 65 years of age[2].

Persons for whom annual vaccination is recommended

- Children aged 6—59 months
- Women who will be pregnant during the flu season
- Persons aged ≥ 50 years
- Children and adolescents who receive long-term aspirin therapy
- Adults and children who have chronic pulmonary or cardiovascular disorders
- Adults and children who require regular medical care during the preceding year because of chronic metabolic diseases, renal dysfunction, hemoglobinopathies or immunodefiency
- Adults and children who have any conditions that can compromise respiratory function or the handling of respiratory secretions, or that can increase the risk of aspiration
- Residents of chronic-care facilities that house persons of any age who have chronic medical conditions
- Persons who live or care for persons at high risk for flu complications, including healthy household contacts and caregivers of children aged 0-59 months
- Health care workers

Why vaccinate household contacts of children?

There are many reasons why household contacts of children should be vaccinated. First, infants who are <6 months of age cannot be vaccinated against influenza. The age indication on the vaccine begins at 6 months of age. If parents and other people living in the household are vaccinated against influenza, this helps to prevent one of those members getting sick with influenza and transmitting it to the unprotected infant. Second, many times a household contact has an underlying medical condition that can put them at high risk for complications of influenza. This person should be vaccinated against influenza. Third, out of home caregivers should be vaccinated against influenza to prevent spreading the disease to children under their care.

What is the schedule for childhood influenza vaccination?

The ACIP emphasizes that all children 6 months to <9 years who have not been previously vaccinated at any time with either live attenuated influenza vaccine (LAIV or FluMist ®) or trivalent inactivated influenza vaccine (TIV) should receive 2 doses of vaccine. Those children aged 6 months to <9 years who receive TIV should have a booster dose of TIV administered 1 month after the initial dose. LAIV (Flu Mist®) is indicated for healthy children who are 5 years of age and older. Those children 5 to <9 years who receive LAIV, should have a second dose of LAIV 6 to 10 weeks after the initial dose[3]. The optimum time to have a child vaccinated against influenza is prior to the onset of the influenza season. In Colorado, the influenza season typically peaks from late January to late February. It is ideal for children who have never been vaccinated to start with the first dose in October with the booster dose in November. However, vaccination through December and into January is acceptable.

Need more information? For more information on influenza vaccination in children, please visit www.cdc.gov/mmwr/preview/mmwrhtml/rr55e628a1.htm.

1. Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine Preventable Diseases. 9th edition January 2006: 233-254.
2. Thompson WW, et al. Mortality associated with influenza and respiratory syncytial virus in the United States. *JAMA* 2003; 289:179-86.
3. Advisory Committee on Immunization Practices Prevention and Control of Influenza. *Morbidity and Mortality Weekly Report.* 6/28/2006:55; 1-41.

2005-2006 Influenza Season in Colorado

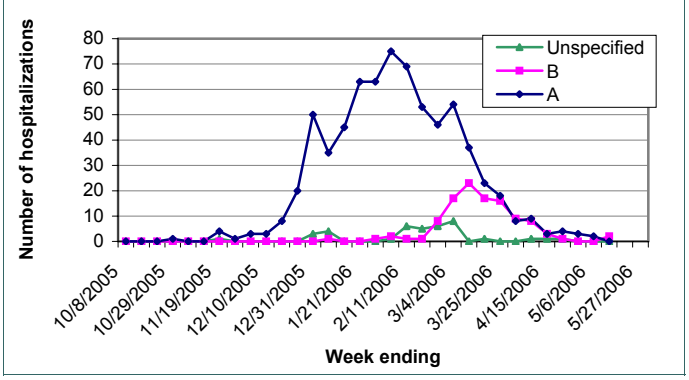
By Melina Evdemon-Hogan, MSPH and Ken Gershman, MD, MPH

The constantly-changing "strains" of influenza viruses cause substantial morbidity and mortality every winter.

Since 1999, Colorado has been actively collecting data submitted by laboratories, hospitals, sentinel providers and long-term care facilities to monitor the burden of the disease caused by influenza and ultimately, protect the public's health. During the cold and flu season, surveillance data are analyzed on a weekly basis and population risk is assessed. Colorado influenza surveillance data can be accessed on the Colorado Department of Public Health and Environment website at: www.cdphe.state.co.us/dc/Influenza/index.html.

An important component of influenza surveillance in Colorado consists of the reporting of influenza-associated hospitalizations. During the 2005-2006 season, there were a total of 848 reported influenza-associated hospitalizations (compared to 980 hospitalizations in the previous season). Among reported cases with specified influenza virus type (96% of reported cases), 86% were type A and 14% were type B (Fig. 1). The season was divided in two waves with peaks

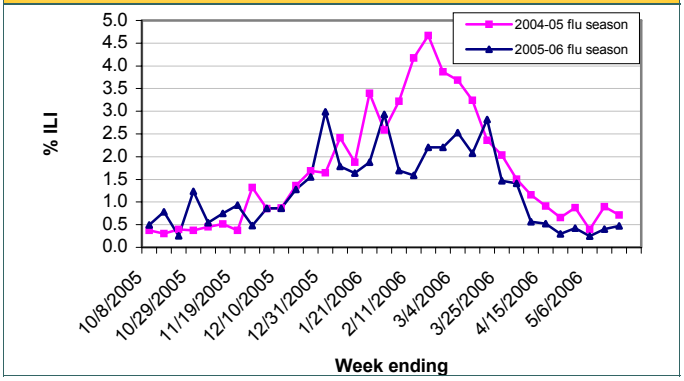
Figure 1: Number of reported influenza-associated hospitalizations by week of diagnosis, Colorado, 2005-2006



separated by more than a month. Type A-associated hospitalizations peaked during the week ending on February 4th, whereas, type B-associated hospitalizations peaked during the week ending March 11th. Of the type B-associated hospitalizations, 55% were children 10 years of age or younger (compared to 31% of type A-associated hospitalizations in this age group). The highest age group specific rates of reported hospitalizations were in infants <6 months of age (Table 1), followed by persons 80 years of age or older. Children 6-23 months of age had the third highest rate.

Another important part of the influenza surveillance program in Colorado is the reporting of influenza-like illness (ILI) by sentinel physicians. Since 1999, Colorado has been enrolled in the U.S. Influenza Sentinel Provider Surveillance Network, a collaborative effort between CDC, state and local health departments, and health care providers. Sentinel providers report the total number of patient visits each week and number of patient visits for influenza-like illness by age group. During the 2005-2006 flu season, data collected by Colorado's sentinel providers indicated that the season was milder than the previous year and that the highest levels of ILI spanned from December through March without a distinct peak (Fig. 2).

Figure 2: Percent of patients seen weekly by a participating sentinel provider with a diagnosis of influenza-like illness (ILI), Colorado 2005-06 vs. 2004-05



A further goal of sentinel providers is to collect clinical specimens for influenza virus isolation, typing and sub-typing from early, mid, and late parts of the season. For example, during the 2005-06 flu season, 192 specimens were sent to the state laboratory for typing. Of these, 79% were influenza type A and 21% were type B.

Providers of any specialty and in any type of practice can participate in the Colorado Influenza Surveillance Program and become a sentinel provider. If you and/or your practice would like to be a part of the Colorado Influenza Surveillance Program, please contact Melina Evdemon-Hogan at melina.evdemon-hogan@state.co.us or (303) 692-2778.

Table 1: Number and Rates of Influenza-Associated Hospitalizations by Age Group, Colorado 2005-2006

Age	No.	%	Rate per 100,000
<6 mo	82	9.7	238.1
6-23mo	103	12.1	100.4
2-4	59	7.0	30.5
5-10	41	4.8	10.9
11-17	31	3.7	6.8
18-39	61	7.2	4.1
40-49	24	2.8	3.2
50-59	57	6.7	10.1
60-69	82	9.7	27.2
70-79	133	15.7	66.1
80+	175	20.6	152.4
Total	**848**	**100**	**18.5**

Contributors

Deb Aragon is an epidemiologist at the CDPHE.

Melina Evdemon-Hogan is an epidemiologist at CDPHE specializing in influenza and zoonotic diseases.

Ken Gershman is Chief of Communicable Disease Epidemiology at CDPHE.

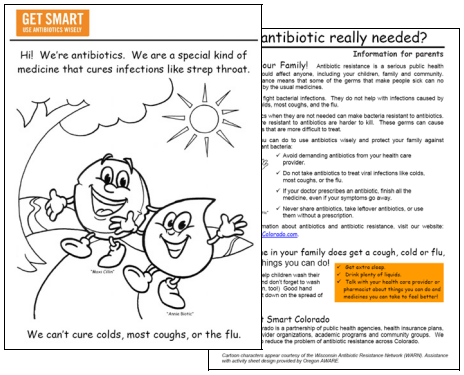
Roberta Smith is coordinator of the Colorado Influenza and Pneumoccocal Alert Coalition (CIPAC).

Free Activity Sheets!

Did you know Get Smart Colorado has free activity sheets you can download and print from their website? These coloring pages, mazes and word finds are fun for kids of all ages. On the back of each activity sheet is important information for parents about antibiotic resistance and appropriate use of antibiotics.

Print and copy the activity sheets for your office waiting area, for your office staff to hand out, or for you to give to patients and parents during their visit.

Download the activity sheets and other materials from the website: www.GetSmartColorado.com. Go to the "Materials" page. Click on "Materials for childcare providers and educators."



Free Resources!

CME and CPE credits available. CME and CPE credits are available through a supplement to *The American Journal of Medicine.* The intent of the supplement to is to review the current evidence related to the mechanisms and clinical outcomes of antimicrobial resistance, as well as to evaluate current clinical practices in light of available evidence to optimize clinical outcomes. The articles in the supplement aim to remind clinicians of the inherent complexities of antimicrobial resistance while providing a better understanding of its mechanisms, epidemiology, and management and suggesting the most effective tools to alter its course. The course can be accessed online: www.amjmed.com/content/supple.

Lysol. LYSOL® and the National Association of Pediatric Nurse Practitioners developed an activity booklet focused on a variety of health and safety issues aimed at 6 - 9 year olds. Up to 40 activity books can be ordered free of charge from Lysol's website, www.lysol.com/news.shtml.

Pfizer Consumer Health Care. California AWARE (Alliance Working for Antibiotic Resistance Education) has a link on their website for clinicians to order free cold kits from Pfizer Consumer Health Care. Clinicians could distribute the kits to parents expecting something from the visit. They can be ordered from the AWARE website: www.aware.md/ed_materials/cold_kits.

GET SMART COLORADO
USE ANTIBIOTICS WISELY

Get Smart Colorado
c/o CO Department of Public Health and Environment
DCEED/DSI/A3/3630
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Phone: 303-692-2459
Fax: 303-782-0338
Email:getsmartcolorado@state.co.us

Comments, questions, suggestions? Unsubscribe? Please contact us at the email or phone number above.

WE'RE ON THE WEB!
WWW.GETSMARTCOLORADO.COM

This newsletter is brought to you by *Get Smart Colorado,* is a coalition dedicated to minimizing the problem of antibiotic-resistant bacteria in Colorado by providing education about and support for the appropriate use of antibiotics through collaborative efforts. We are funded by The Colorado Health Foundation and the Centers for Disease Control and Prevention and currently located at the Colorado Department of Public Health and Environment