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Pharmacy & Therapeutics Update: Drug Information for Health Care Professionals

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Update

Drug Information for Health Care Professionals

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CMS Quality Indicator Initiatives Series Part IV: Community Acquired Pneumonia

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Health care is always a top priority in this country and often the topic of discussion and debate. In 2004, Medicare spent $300 billion on health care costs, making it the largest purchaser of healthcare in the nation.[1]

In an effort to improve the quality of health care and decrease costs, the Department of Health and Human Services (DHHS) and the Centers for Medicare and Medicaid Services (CMS) have joined to create a program called the Quality Initiative. The purpose of the initiative is to encourage health care providers to enhance the quality of care by providing financial incentive and to empower consumers with quality of care information to make more informed decisions about their health care. The details regarding the initiatives are described in the March issue. (www.musc.edu/pharmacyservices/PnT/Mar07.pdf)

This month, the focus will be on community acquired pneumonia. Pneumonia is among the 10 leading causes of death in the United States and is a significant cause of outpatient visits and hospitalizations.[3] Although overall hospitalization rates are declining, hospitalizations for acute lower respiratory tract infections have increased steadily since 1980, particularly in the elderly.[3]

The 7 specific quality measures identified by CMS are listed in Table 1. The majority of recommendations contained within these measures are based on the Infectious Disease Society of America (IDSA) practice guidelines representing the best practice for the management of community acquired pneumonia.

Data regarding performance in these specific measures are entered into a database that is accessible to the public online through the HHS Web site at www.hospitalcompare.hhs.gov. The rates of compliance with each measure are available for MUSC, other local hospitals, as well as state and national averages. Data reported for discharges from The national benchmark and MUSC from January through March 2007 are listed in Table 1.

Appropriate initial antibiotic selection is critical for the treatment of pneumonia. Guidelines for community acquired pneumonia (CAP) in immunocompetent patients are from the Centers for Disease Control and Prevention (CDC), IDSA, the Canadian Infectious Disease Society/Canadian Thoracic Society (CIDS/CTS), and the American Thoracic Society (ATS). All of these guidelines reflect the following: *Streptococcus pneumoniae* is the most common cause of CAP; treatment that covers "atypical" pathogens (eg, Legionella sp, *Chlamydia pneumonia, Mycoplasma pneumonia,*) can be associated with improved survival; and prevalence of antibiotic resistant *S. pneumonia* is increasing. The 2 main guidelines to review include IDSA and ATS. The links to the guidelines are located in Table 2.

Clinical data suggests that appropriate timing of antibiotic therapy is as critical as appropriate selection. There is increasing evidence between timely inpatient administration of antibiotics and improved outcome among patients with pneumonia. Kahn and colleagues found that Medicare pneumonia patients had improved survival if antibiotics were received within 4 hours of admission. McGarvey and colleagues found

Table 1. Quality Indicators for Community Acquired Pneumonia and Compliance Rates

Measure	Description	MUSC Rate of Compliance	
		National Benchmark	FY 2007 Year-to-Date*
Appropriate initial antibiotic selection	Immunocompetent patients with pneumonia should receive an initial antibiotic regimen that is consistent with current guidelines	97.1%	82.5%
Initial antibiotic Timing	Pneumonia inpatients should receive within 4 hours after arrival at the hospital	95.6%	67%
Blood culture performed prior to first antibiotic received in hospital	Blood cultures should be performed in the Emergency Department prior to initial antibiotic received in the hospital	98.9%	92.9%
	Blood cultures should be performed within 24 hours prior to or 24 hours after hospital arrival for patients who were transferred or admitted to the ICU within 24 hours of hospital arrival	99.6%	100%
Pneumococcal vaccination	Pneumonia inpatients age 65 and older should be screened for pneumococcal vaccine status and administered the vaccine prior to discharge, if indicated	97.9%	66.2%
Influenza vaccination	Pneumonia patients age 50 years and older should be screened for influenza vaccine status and administered the vaccine prior to discharge, if indicated	97.4%	62.5%
Oxygenation assessment	Pneumonia inpatients should receive an oxygenation assessment arterial blood gas (ABG) or pulse oximetry within 24 hours of hospital arrival	100%	100%
Smoking cessation advice/counseling	Pneumonia patients with a history of smoking should receive smoking cessation advice or counseling during their hospital stay	99%	91.8%
30-day pneumonia mortality	Future indicator that will be measured.	*No data currently*	

* Data are current as of March 2007

that shortening the time-to-first-dose to 4 hours was associated with improved survival. IDSA and ATS recommend blood cultures in all patients with severe pneumonia so that optimal therapy can be provided. The CMS measures call for blood cultures prior to first antibiotics in the Emergency Department or within 24 hours of admission.

Vaccination in the US is suboptimal especially in high-risk patients. Protocols for pneumcoccal and influenza screening provide a means for health care providers to assess and vaccinate patients at risk. Data show that appropriate vaccination decrease the risk for influenza-related pneumonia, pneumococcal bacteremia or mennigitis, hospitalization, or death. An automatic nursing order

Measure	Tools to Assist with Compliance
Appropriate initial antibiotic selection	1. Contact or consult Infectious Disease for assistance in selection or review the following guidelines: IDSA: www.journals.uchicago.edu/CID/journal/issues/v31n2/000441/000441.html ATS: www.thoracic.org/sections/publications/statements/pages/mtpi/commacq1-25.html 2. Use selected clinician order forms for guidance: Emergency Services Triage Physician Orders: www.musc.edu/cce/ORDFRMS/pdf/edtriageorders.pdf CAP Admission Orders: www.musc.edu/cce/ORDFRMS/pdf/PUDCAP801.pdf
Initial antibiotic timing	1. Contact or consult Infectious Disease for assistance in selection or review the guidelines 2. Review Pneumonia Severity Index Calculator: http://pda.ahrq.gov/clinic/psi/psicalc.asp 3. Use selected clinician order forms for guidance: Emergency Services Triage Physician Orders: www.musc.edu/cce/ORDFRMS/pdf/edtriageorders.pdf CAP Admission Orders: www.musc.edu/cce/ORDFRMS/pdf/PUDCAP801.pdf
Blood cultures in ED prior to antibiotics	1. Review Pneumonia Severity Index Calculator: http://pda.ahrq.gov/clinic/psi/psicalc.asp 2. Use selected clinician order forms for guidance: Emergency Services Triage Physician Orders: www.musc.edu/cce/ORDFRMS/pdf/edtriageorders.pdf CAP Admission Orders: www.musc.edu/cce/ORDFRMS/pdf/PUDCAP801.pdf
Blood cultures within 24 hours of arrival	1. Review Pneumonia Severity Index Calculator: http://pda.ahrq.gov/clinic/psi/psicalc.asp 2. Review the IDSA and/or ATS guidelines 3. Use selected clinician order forms for guidance: ADULT HAP/VAP/HCAP Medication Orders: www.musc.edu/cce/ORDFRMS/pdf/hapvaphcap.pdf CAP Admission Orders: www.musc.edu/cce/ORDFRMS/pdf/PUDCAP801.pdf
Pneumococcal vaccination	1. Automatic nursing order for all patients that meet criteria 2. Use selected clinician order forms for guidance: Adult Immunization Orders: www.musc.edu/cce/ORDFRMS/pdf/adultimmun.pdf Adult Pneumococcal Vaccination Standing Orders: www.musc.edu/cce/ORDFRMS/pdf/Pneumovaxpaper.pdf
Influenza vaccination	1. Automatic nursing order for all patients that meet criteria 2. Use selected clinician order forms for guidance: Adult Immunization Orders: www.musc.edu/cce/ORDFRMS/pdf/adultimmun.pdf Adult Influenza Vaccine Standing Orders: www.musc.edu/cce/ORDFRMS/pdf/Trivalentvacpaper.pdf
Smoking cessation advice/counseling	1. Check boxes on History and Physical (H&P) Inpatient H&P Form (checkbox on pages 6 & 7): www.musc.edu/cce/ORDFRMS/pdf/longhp.pdf Medication Reconciliation Form: www.musc.edu/cce/ORDFRMS/pdf/medreconciliation.pdf 2. Use selected clinician order forms for guidance: Adult Universal Admission Orders: www.musc.edu/cce/ORDFRMS/pdf/universaladmit.pdf Discharge Orders (checkbox pg 2): www.musc.edu/cce/ORDFRMS/pdf/dischgeneral.pdf You Can Quit (Patient Handouts): www.musc.edu/medcenter/pted/HealthAndWellness/source/tobaccoCessation/index.htm Family Medicine Clerkship: Smoking and Tobacco Addiction: http://fammed.musc.edu/fmc/data/Smoking.htm Medlineplus: Smoking Cessation Patient Information: www.nlm.nih.gov/medlineplus/smokingcessation.html

should be placed in each patients chart. If the patient meets criteria, the vaccination should be provided prior to discharge.

Inadequate oxygen in the arterial blood is common in severe pneumonia and is a known mortality risk factor. Giving supplemental oxygen has been shown to decrease mortality among patients with pneumonia. Due to the overall high compliance by all hospitals, this indicator is currently under review by the CMS advisory board and may be retired in the next measure update.

Lastly, tobacco use is the greatest cause for disease in the US. Therefore, it is important to talk with our patients about smoking cessation. Hospitalization can be an ideal opportunity for a patient to stop smoking, and smoking cessation may promote the patient's medical recovery. Patients who receive even brief smoking cessation advice from their health care providers are more likely to quit than those who receive no counseling whatsoever. For purposes of this measure, a smoker is defined as someone who has smoked cigarettes anytime during the year prior to hospital arrival. Smoking cessation counseling must be documented in the chart. Specific locations are provided in Table 2.

The individual measures offer hospitals specific goals that can be used to improve patient care. As part of the MUSC Excellence campaign, the organization has established a goal that 80% of the CMS Indicators meet or exceed national benchmarks. From the data presented in Table 1, there are a few areas that still need attention; therefore, is it critical that every health care professional is aware of the CMS Initiative, how the organization is performing, and where we need to focus our efforts.

DID YOU KNOW...

Ceftriaxone Interaction with Calcium-containing Products

The product labeling for ceftriaxone (Rocephin®) has been updated to include a warning regarding the co-administration of ceftriaxone and calcium-containing intravenous products. There have a several case reports of fatal precipitate formation in neonates. Although there are no reported cases of ceftriaxone-calcium precipitates in patients other than neonates, the potential for this interaction exists in patients of any age. Generally, fatalities have been associated with simultaneous administration of ceftriaxone and calcium-containing products. However, administration of the 2 products at different times and via different infusion lines has also been fatal. Therefore, ceftriaxone should not be mixed with calcium-containing products and not administered in the same or different infusion lines or sites in any patient within 48 hours of each other. Due to the potential for this interaction, a warning message has been placed in the comments section of ceftriaxone and calcium-containing products that will be printed on the patient's medical administration record (MAR).

Tegaserod Available through Treatment IND

Food and Drug Administration (FDA) announced that it is permitting the restricted use of tegaserod (Zelnorm®) under a treatment investigational new drug (IND) protocol to treat irritable bowel syndrome with constipation (IBS-C) and chronic idiopathic constipation (CIC) in women younger than 55 who meet specific guidelines.

In some instances, patients with a serious or life-threatening disease or condition who are not enrolled in a clinical trial may be treated with a drug not approved by the FDA. Generally, such use is allowed within guidelines called a treatment IND, when no comparable or satisfactory alternative drug or therapy is available.

In addition to the age and gender restrictions, the IND protocol for tegaserod limits use of the drug to those with IBS-C or CIC whose physicians decide the drug is medically necessary. Patients must sign consent materials to ensure they are fully informed of the potential risks and benefits of tegaserod.

Physicians that have patients with IBS-C or CIC who meet the IND criteria should contact the manufacturer, Novartis. More information regarding the IND can be found at www.zelnorm.com

POLICIES AND ORDER FORMS: RECENT P&T COMMITTEE APPROVALS

Preprinted Orders:
- *Nutrition Support Team Standard Nutrition Orders – Standing Order Form* (new)
- *Electrolyte Replacement for Adult ICU Patients* (new)
- *Dexmedetomidine Order Form for Operating Room Patients* (new)
- *Synera™ Orders for Non-emergent Needle Sticks* (new)
- *Pediatric Sickle Cell: Acute Pain Crisis Admission Orders* (new)
- *Pediatric Sickle Cell: Acute Pain Crisis Management Orders* (new)
- *Adult Hypoglycemia Prevention and Treatment Order Form* (revised)
- *Adult Hyperglycemia Prevention and Treatment Order Form* (new)
- *Pediatric Inpatient Insulin Pump Orders* (new)
- *Pediatric Hypoglycemia Standing Orders* (new)

New or Updated Policy and Procedures:
- *Adult Hypoglycemia Prevention and Treatment Protocol* (revisions to C-106)
- *Adult Hyperglycemia Prevention and Treatment Protocol* (new policy)
- *Parenteral Nutrition and Lipid Infusions Policy* (new medical center policy)
- *Formulary Systems* (revisions to C-82)
- *Intravenous Push Administration for Adult and Pediatric Patients* (new medical center policy)

FORMULARY UPDATE FOR JULY 2007

The Pharmacy and Therapeutics Committee recently approved the actions listed below. The formulary effective date was August 15, 2007, unless otherwise stated.

Addition:
Midodrine (ProAmantine®)
2.5-, 5-, and 10-mg tablets

Cefoxitin (Mefoxin®)
1 and 2 grams

Changes in Restriction:
1. **Gadopentetate dimeglumine (Magnevist®):** The restriction has been removed; therefore, this agent will be available for all patients (*effective July 24, 2007*)

2. **Gadobenate dimeglumine (Multihance®):** Gadobenate will be available on a restricted basis with the following restriction: for use in patients undergoing contrast-enhanced MRI of the CNS, hepatobiliary contrast-enhanced imaging for metastatic detection or a subset of MRCP (ie, evaluation of the intrahepatic biliary tree), or patients who have end-stage renal disease requiring dialysis (*effective July 24, 2007*)

3. **Remifentanil (Ultiva®)** is now restricted to physicians on the Anesthesiology service and in the Emergency Department.

Line Extensions:
Sterile talc (Sclerosol®)
4-gram intrapleural aerosol

Fluticasone/salmeterol inhalers (Advair® HFA) are now available in addition to the dry powder inhalers (Advair® Diskus). **Please note the difference in available strengths and dosing between the 2 inhalers.***

Advair® HFA:
- 2 puffs, twice daily
- 45/21-, 115/21-, and 230/21-microgram inhalers

Advair® Diskus:
- 1 inhalation, twice daily
- 100/50-, 250/50-, and 500/50-microgram inhalers

Extemporaneous suspensions:
- Phenazopyridine 10 mg/mL
- Carvedilol 0.1 and 1.67-mg/mL
- Omeprazole 2-mg/mL (with clinical justification)
- Dapsone 2-mg/mL
- Atenolol 2-mg/mL

Deletion:
Effective October 1, 2007
Insulin aspart protamine/insulin aspart (NovoLog® 70/30) will be deleted from the formulary due to safety concerns. *This product will not be allowed through the non-formulary process.* If the patient is stabilized on this at home, separate orders for a basal insulin (ie, NPH, insulin glargine) and a rapid-acting insulin (ie, insulin aspart) must be written.

FORMULARY UPDATE FOR AUGUST 2007

The Pharmacy and Therapeutics Committee recently approved the actions listed below. The formulary effective date was September 19, 2007.

Addition:
Lidocaine/tetracaine patch (Synera™) provides local dermal analgesia when applied to intact skin prior to superficial venous access and superficial dermatological procedures. Additionally, the patch generates a mild warming that enhances the delivery of the local anesthetics by causing vasodilation. A preprinted order form was approved for use in patients at least 3 years of age. Multiple patches should not be used. The patch should be removed prior to magnetic resonance imaging.
Topical patch: lidocaine 70 mg/tetracaine 70 mg

Line Extension:
Replacement fluid, BGK 2/0 (PrismaSOL®) is the dialysate fluid used in conjunction with PrismaSATE®, a replacement fluid. These products look very similar so please be cautious when administering these products as they will be used concomitantly.
5-liter bag

Not Added:
Micafungin (Mycamine®)
A class review for the echinocandin anti fungal agents was performed. This class includes caspofungin (Cancidas®), micafungin (Mycamine®) and anidulafungin (Eraxis®). All agents have similar efficacy against *Candida* species; however, caspofungin has additional FDA-approved indications for febrile neutropenia and invasive aspergillosis in patients refractory to other therapies.

Based on contract pricing, micafungin offers no substantial advantage over caspofungin and anidulafungin is more costly than either agent. Therefore, it was recommended not to add micafungin to the formulary. Caspofungin will remain on the formulary as the echinocandin of choice.

FORMULARY UPDATE FOR SEPTEMBER 2007

The Pharmacy and Therapeutics Committee recently approved the actions listed below. The formulary effective date was October 15, 2007, unless otherwise noted.

Additions:
Fondaparinux (Arixtra®) is indicated for the prophylaxis or treatment of DVT/PE. There are limited data regarding its use in patients with a history of heparin-induced thrombocytopenia. Fondaparinux is not indicated in patients with a creatinine clearance less than 30 mL/min; therefore, enoxaparin (Lovenox®) or unfractionated heparin should be used.
2.5-, 5-, 7,5-, and 10-mg syringes

Cocaine ophthalmic solution is used for the diagnosis of Horners syndrome. The 4% topical cocaine solution and sodium bicarbonate will be used to compound the ophthalmic solution with an appropriate pH.
(*Effective November 1, 2007)*
3.7% extemporaneous ophthalmic solution

Cefotetan (various)
1 and 2 grams

Line Extensions:
Mitomycin 0.02% ophthalmic solution [0.2 mg/mL extemporaneous ophthalmic solution]

Clotrimazole (2%) 3-day vaginal cream [21-g tube]

Albuterol HFA Inhalers (ProAir®) [8.5-g container]

Deletions:
Sodium diatrizoate (Gastroview®)
Effective September 25, 2007

Dalteparin (Fragmin®)
[2500, 5000, 10,000 units]

Lidocaine (LMX-4®) cream
[30-g tube]

Clotrimazole(1%) 7-day vaginal cream [45-g tube]

Esmolol (Brevibloc®)
[250-mg/mL ampules]

Digoxin (various)
[0.05- and 0.1-mg capsules]

Repository corticotrophin injection (H.P. Acthar® Gel)
[5-mL, multi-dose vial]