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The Omnicare HealthLine

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Focus on COPD Exacerbation – Part II: Treatment and Prevention

- by Allen Lefkovitz

According to the 2016 Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines, "the goals of treatment for COPD exacerbations are to minimize the impact of the current exacerbation and prevent the development of subsequent exacerbations." While last month's focus article overviewed defining and identifying COPD exacerbation, this month's article examines both the treatment and prevention of COPD exacerbations.

As stated in last month's focus article, CMS added acute exacerbation of COPD to their Hospital Readmissions Reduction Program in October 2014 because 30-day readmissions for COPD ranged from 17-25% at baseline. When prompt and proper therapy is employed, less than 20% of COPD exacerbations are estimated to require hospitalization. The three most commonly used therapies that are successful in treating a COPD exacerbation outside of the hospital are:

Short-Acting Bronchodilators | **Oral or Parenteral Corticosteriods** | **Antibiotics**

In addition to these three therapies, supplemental oxygen should also be considered with a target saturation of 88-92%.

Short-Acting Bronchodilators

Although recommended maintenance therapy of COPD involves long-acting bronchodilators (in GOLD patient groups B through D and as alternatives for even group A), short-acting beta2-agonists (e.g., albuterol) are the mainstay of acute treatment during an exacerbation due to their ability to relax airway smooth muscle quickly. Short-acting anticholinergic agents (i.e., ipratropium) may be used as an alternative to beta2-agonists if a beta2-agonist is not tolerated, or may be considered in combination with a beta2-agonist (e.g., Combivent Respimat, Duoneb) if additional therapy is warranted.

Corticosteroids

While unacceptable for chronic use due to their adverse effect profile, oral corticosteroids, such as prednisone 40 mg daily (or equivalent), help improve symptoms and lung function during an exacerbation, and have been shown to decrease the risk of early relapse, as well as decreasing the length of hospital stays related to COPD. The usual duration of oral corticosteroid therapy is 5 to 14 days (GOLD recommends 5 days), but should be no longer than 30 days; however, if use is longer than 14 days, a gradual tapering of the dose is recommended to avoid withdrawal symptoms (e.g., headache, dizziness, lethargy, nausea, body aches), and to allow for the normal restoration of an individual's pituitary-adrenal response. While the oral route is preferable, parenteral corticosteroids are also an option. Likewise, when other therapies are not feasible or are not available, the inhaled corticosteroid, budesonide (Pulmicort) also may be considered for off-label use.

Corticosteroids (continued)
Following resolution of the acute exacerbation, patients who are Patient Group C or D according to the GOLD guidelines are candidates for maintenance therapy with a combination long-acting bronchodilator and an inhaled corticosteroid (ICS) [e.g., vilanterol / fluticasone (Breo Ellipta), salmeterol / fluticasone (Advair)].

Antibiotics
With the heightened awareness of the need for strong antimicrobial stewardship practices, the question remains, is an antibiotic necessary for all COPD exacerbations?
Antibiotics are credited with reducing short-term mortality by 77%, treatment failure by 53%, and sputum purulence by 44%; however, viral infections are a common trigger for a COPD exacerbation and it would not be appropriate to treat these cases with antibiotic therapy. Initiation of antibiotic treatment for a COPD exacerbation should occur when a moderate-to-severe bacterial infection is suspected. Although some may advocate for treatment of even a mild infection, any of the following 3 criteria outlined in the GOLD guidelines are considered justification for using an antibiotic in a patient with a COPD exacerbation:

- have 3 cardinal symptoms (increased dyspnea, increased sputum volume, and increased sputum purulence); or
- have 2 cardinal symptoms where increased sputum purulence is one of the two symptoms; or
- require mechanical ventilation

Prior to initiating antibiotics, local resistance patterns and recent antibiotic use should be assessed. Once the decision to treat with an antibiotic has been made, selection of empiric therapy should be based upon the individual's allergy profile, the severity of infection, as well as the most frequently suspected organisms. Although sputum cultures generally are not recommended due to their unreliability, if a Gram-negative (e.g., *Pseudomonas aeruginosa*) or a resistant pathogen is suspected, it may be considered. In selecting the antibiotic therapy, oral administration is considered preferable, but the route of administration should be determined by the individual's clinical status and their ability to take medications by mouth. Potential treatment options for a bacterial acute COPD exacerbation are outlined below.

Severity	Most Frequent Mircoorganisms	Potential Antibiotic Options
Mild to Moderate	*Haemophilus influenzae* *Moraxella catarrhalis* *Streptococcus pneumoniae* *Chlamydia pneumoniae* *Mycoplasma pneumoniae*	amoxicillin/clavulanate azithromycin
Severe	*Haemophilus influenzae* *Moraxella catarrhalis* *Streptococcus pneumoniae* *Klebsiella pneumoniae* *Acinetobacter spp.*	amoxicillin/clavulanate azithromycin moxifloxacin
Very Severe	*Haemophilus influenzae* *Streptococcus pneumoniae* *Klebsiella pneumoniae* *Acinetobacter spp.* *Pseudomonas aeruginosa*	amoxicillin/clavulanate azithromycin moxifloxacin ciprofloxacin

Preventing a COPD Exacerbation

Because COPD exacerbations accelerate the rate of decline of lung function and are associated with significant mortality, prevention of future COPD exacerbations cannot be overemphasized. Currently, four medications are FDA approved as maintenance COPD therapy that may help reduce the risk of COPD exacerbations:

salmeterol / fluticasone *(Advair Diskus)*	**vilanterol / fluticasone** *(Breo Ellipta)*	**tiotropium** *(Spiriva HandiHaler or Respimat)*	**roflumilast** *(Daliresp)*

The fourth medication shown above, roflumilast (Daliresp), is an oral phosphodiesterase-4 inhibitor that has been shown to reduce moderate to severe exacerbations when used in combination with one or more long-acting bronchodilators, with or without an inhaled corticosteroid. As roflumilast is associated with weight loss and diarrhea, patients utilizing this therapy should be closely monitored. While other combination long-acting bronchodilator / ICS products, such as olodaterol / tiotropium (Stiolto Respimat) and vilanterol / umeclidinium (Anoro Ellipta) are approved for the maintenance treatment of COPD, and they have data available for use in reducing COPD exacerbations, they currently are not FDA approved for this additional indication.

In addition to optimizing medication therapy, strategies to help reduce the risk of COPD exacerbations include the following:

Encourage smoking cessation	**Maintain fluid intake and proper environmental humidity**	**Avoid contact with visitors/staff with respiratory tract infection symptoms**
Promote use of controlled breathing techniques *(e.g., pursed lips)*	**Maintain up to date immunization records** *(see recommendations below)*	**Reinforce proper inhaler technique or change devices**

For individuals diagnosed with COPD, the following vaccinations are specifically recommended:

INFLUENZA	PNEUMOCOCCAL	PERTUSSIS
• Recommended each year for everyone 6 months of age or older, unless otherwise contraindicated • Can reduce risk of serious illness and death	• 65 years and older: PCV13 (Prevnar 13) followed by PPSV23 (Pneumovax 23) at least 1 year later • 19 years to 64 years should receive: PPSV23 and then after 65 years of age, administer PCV13 followed by another dose of PPSV23 (at least one year after PCV13 and at least 5 years after first dose of PPSV23)	• Pertussis (“whooping cough”) is associated with exacerbation of chronic bronchitis A one-time dose of tetatnus, diphtheria, pertussis (Tdap) is recommended in place of one of the every 10 year tetanus diphtheria (Td) boosters

PCV13 = Pneumococcal conjugate vaccine; PPSV23 = Pneumococcal polysaccharide vaccine

COPD exacerbations remain a challenge that requires risk factor reduction whenever possible, vigilant monitoring for changes in symptoms, clear parameters for when to take further action, and routine assurance of medication compliance.

Medication Safety

by Yamini Shah

Unsafe Abbreviations and Dose Expressions

The use of unsafe abbreviations and dose expressions in medical documents or records can lead to misinterpretation, medication errors, and patient harm. In 2004, the Joint Commission created a "Do Not Use" List of dangerous abbreviations that applies to medication-related documents. The Institute for Safe Medication Practices has also provided a more comprehensive List of error-prone abbreviations, symbols, and dose designations that should not be used in medical communications. The abbreviations included in these Lists are reported as being frequently misinterpreted and involved in harmful medication errors.

Help prevent medication errors by avoiding the use of unsafe abbreviations and dose expressions when communication medial information verbally or in writing.
If you are reading a document wth an abbrevaiton or dose expression that in unclear, seek clarification.

In an effort to reduce medical errors related to abbreviations, many health care organizations, including Omnicare, have implemented an internal list of abbreviations that are considered unsafe and should be avoided when communicating medical information. Some examples where appropriate abbreviations are expected include: phone order transcriptions; patient chart or record entries (written AND electronic); clinician or consultant reports; "fax-back" or other pre-printed prescriber communication or documents such as therapeutic interchange forms, standing orders; and, other hand-written or printed documents used for patient-specific communication maintained at business unit level.

Selected Unsafe Abbreviations and Dose Expressions[a]

Dangerous Abbreviation or Dose Expression	Intended Meaning	Potential Misinterpretation	Correction
Lack of a leading zero (Example .1 mg)	0.1 mg	Misread as 1 mg	Always use a zero before a decimal when the dose is less than a whole number. (Example: write **0**.1 mg)
Trailing zero (Example 1.0 mg)	1 mg	Misread as 10 mg	Do not use trailing zeros for doses expressed in whole numbers. (Example: write **1 mg**)
U or u	Unit	Misread as a zero (0) or a four (4)	Write "unit"
IU	International Unit	Misread as 10 or IV	Write "International Unit"
q.d., qd, QD, or Q.D.	Every day	Period after the "q" or the tail of the "q" is misread as an "I" or an "o"	Write "daily"
q.o.d., qod, QOD or Q.O.D.	Every "other" day	Misread as q.i.d (four times daily)	Write "every other day"
MS, MSO4, MgSO4	morphine sulfate or magnesium sulfate	Confused for one another	Write "morphine sulfate" or Write "magnesium sulfate"
Drug name and dose run together (Example: Tegretol300 mg)	Tegretol 300 mg	Misread as Tegretol 1300 mg	Place adequate space between the drug name, dose, and unit of measure
Numerical dose and unit of measure run together (Examples: 10mg or 100mL)	10 mg or 100 mL	"m" is mistaken as a zero or two zeros, risking a 10- to 100-fold overdose	Place adequate space between the dose and unit of measure

[a] Adapted from Omnicare Policies 054 and 054A and Lists from Joint Commission (https://www.jointcommission.org/facts_about_do_not_use_list/) and Institute for Safe Medication Practices (http://www.ismp.org/tools/abbreviations/).

The Clinical Capsule

by Kori Hauersperger

Allergic Rhinitis (AR) Prophylaxis and Treatment with Intranasal Steroids (INS)

The 2015 American Academy of Otolaryngology Clinical Practice Guideline for AR recommends INS when symptoms affect quality of life. The recommendation is based on INS efficacy, superiority over other therapies, and good safety record. INS provided significantly better relief of sneezing and nasal obstruction, watery discharge and itching than loratadine.

Common Medication	Adult Dosing	Information
Fluticasone OTC / Rx Generic, ClariSpray, Flonase, and Veramyst	2 sprays per nostril daily Maintenance: reduce to 1 spray per nostril daily	Side effects include: cough, nasopharyngeal irritation, dryness, and taste disturbance. Pointing the spray away from the septum may decrease bleeding with longer use. Efficacy is best with continuous use. If no improvement after 3 weeks, discontinue. Although products are similarly efficacious, aftertaste, nose runout, throat rundown, and scent differ between products.
Beclomethasone Rx Beconase AQ, Qnasl	Beconase AQ: 1-2 sprays per nostril twice daily Qnasl: 2 sprays per nostril daily	
Mometasone Rx Generic and Nasonex	2 sprays per nostril daily	
Ciclesonide Rx Omnaris, Zetonna	Omnaris: 2 sprays per nostril daily Zetonna: 1 spray per nostril daily	
Budesonide OTC / RX Generic, Rhinocort Allergy, and Rhinocort Aqua	1-2 sprays per nostril daily Max: 4 sprays per nostril daily	
Triamcinolone OTC Generic and Nasacort	2 sprays per nostril once daily initially, then reduce to minimum effective dose	

http://oto.sagepub.com/content/152/1_suppl/S1.full.pdf+html; https://dailymed.nlm.nih.gov/dailymed/search.cfm Does not include all INS

Regulatory Recap: CMS Adverse Event Trigger Tool:

Change in mental status/delirium related to psychotropic medications

- by Carrie Allen

Valproic acid (Depakene) or Divalproex (Depakote) are commonly used medications in the long-term care setting. Though classified as anticonvulsants, they are used for more than just seizures. For example, they can be used in treatment of bipolar disorder, migraine prophylaxis, and severe behavioral disturbances*.

Drug toxicity can occur with valproic acid, particularly if the resident has:

- Existing liver disease
- Impaired renal function
- Is concurrently receiving:
  - Antidepressants
  - Benzodiazepines
  - Antibiotics

Facility check for residents with risk factors

- Does the care plan reflect interdisciplinary monitoring for signs/symptoms of adverse drug reactions to valproic acid?

Signs and symptoms of a potential adverse event from a medication containing valproic acid include:

- Loss of appetite
- Nausea, vomiting, lethargy, and/or confusion
- Dizziness
- Numbness, tingling, weakness or involuntary muscle twitching
- Increased heart rate
- Decreased respirations

Facility check - are there systems to ensure

- Changes in condition are identified and assessed promptly, including an assessment of medications?
- Therapeutic drug concentrations are drawn routinely and lab results are appropriately communicated to the physician, including panic values?
- That extended-release formulations are delivered correctly (e.g., medications not crushed)?

* Use for severe behavioral disturbances is not an FDA-approved use of valproic acid or divalproex.

NEW Drug

by Dave Pregizer

Carnexiv™ Injection for Intravenous Use

Brand Name (Generic Name)	Carnexiv [kar NEX iv]; (carbamazepine) [kar ba MAZ e peen]
How Supplied	200 mg/20 mL (10 mg/mL) single-dose vial
Therapeutic Class	Anticonvulsant
Approved Indication	Short-term (≤ 7 days) replacement therapy for oral carbamazepine formulations, when oral administration is temporarily not feasible.
Usual Dosing	Total daily dose is 70% of the oral dose, divided and given every 6 hours over 30 minutes.
Select Drug Interactions	CYP3A4 inhibitors and inducers can increase or decrease plasma carbamazepine.
Most Common Side Effects	Dizziness, somnolence, blurred vision, diplopia, headache, infusion-related reaction, infusion site pain, and anemia
Miscellaneous	Boxed warning regarding Serious Dermatologic Reactions and Aplastic Anemia and Agranulocytosis. Not recommended for longer than 7 days. Generally should not be used with moderate or severe renal impairment. Monitor liver function before use and periodically thereafter.
Website	www.carnexiv-us.com

NEW Generic Medications

Generic Name	Brand Name	Date Generic Available
Abacavir / Lamivudine 600 mg / 300 mg Tablets	Epzicom® Tablet	10/3/16
Flurandrenolide 0.05% Lotion	Cordran® Lotion	9/19/16

HealthLine Quiz

- by Steve Law

1. **Which would NOT be an appropriate therapy for treating COPD exacerbations?**
   a. Supplemental oxygen
   b. Antibiotics
   c. Long-acting bronchodilators
   d. Oral or parenteral corticosteroids

2. **Which would NOT be an appropriate maintenance COPD therapy to help reduce the risk of COPD exacerbations:**
   a. Tiotropium (Spiriva)
   b. Oral Prednisone
   c. Roflumilast (Daliresp)
   d. Vilanterol/fluticasone (Breo Elipta)

3. **For individuals diagnosed with COPD, a tetanus diphtheria pertussis (Tdap) booster should be given every 10 years:**
   a. True b. False

4. **Which written medication order below has a safe abbreviation and/or dose expression?**
   a. Atenolol25mg once daily
   b. Lantus 10 U every evening
   c. Warfarin 1.0 mg once daily
   d. Levothyroxine 0.075 mg once daily

5. **According to the 2015 American Academy of Otolaryngology Clinical Practice Guideline for Allergic Rhinitis, intranasal steroids provide significantly better relief of sneezing and nasal obstruction, watery discharge and itching than the antihistamine, loratadine:**
   a. True b. False

6. **A symptom of a potential adverse event from valproic acid may be numbness, tingling, weakness or involuntary muscle twitching:**
   a. True b. False

7. **Boxed warnings for the new medication, Carnexiv™ Injection, include serious dermatologic reactions and aplastic anemia and agranulocytosis:**
   a. True b. False

***Please note, the HealthLine Quiz is designed to help readers retain information that is relevant to their care setting. It is not an approved source of continuing education credits for healthcare professionals.**

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Answers to the HealthLine Quiz: 1) C 2) B 3) B 4) D 5) A 6) A 7) A