ACEP ACCELERATE

Essential OU Protocols and Pathways Part 2: Obstructive & Infectious Diseases

Ashima Vohra MD, Emergency Physicians of Northwest Ohio
ED Observation Unit Medical Director at ProMedica Toledo Hospital

Disclosures

None

Objectives

The W’s

Why observe?

Who to observe?

When to observe?

What happens in observation?

ACEP ACCELERATE

Asthma / COPD

Obstructive Pulmonary Diseases

ACEP ACCELERATE

Background

- Obstructive airway disease leads to over 3 million emergency visits in the US annually
- In 2012, more than 3 million people died from COPD worldwide
- Deaths from these disease processes are anticipated to increase due to continued exposure to risk factors and aging
- Utilization of a COPD protocol in an observation unit can decrease 30-day recidivism to the emergency department

ACEP ACCELERATE

Emergency Department Evaluation

- EKG
- Laboratory analysis (CBC, CMP, troponin, BNP)
- Chest x-ray
- Pulse oximetry
- Evaluate response to serial treatments (therapeutic pathway)
- Risk stratification
- Pulmonology input if needed

Risk Stratification

Difficult to do:

- Many options
- Not well validated in ED
- Clinical gestalt prevails

DECAF Score:

- Dyspnea scale
- Eosinopenia
- CXR consolidation
- Acidemia
- Atrial fibrillation

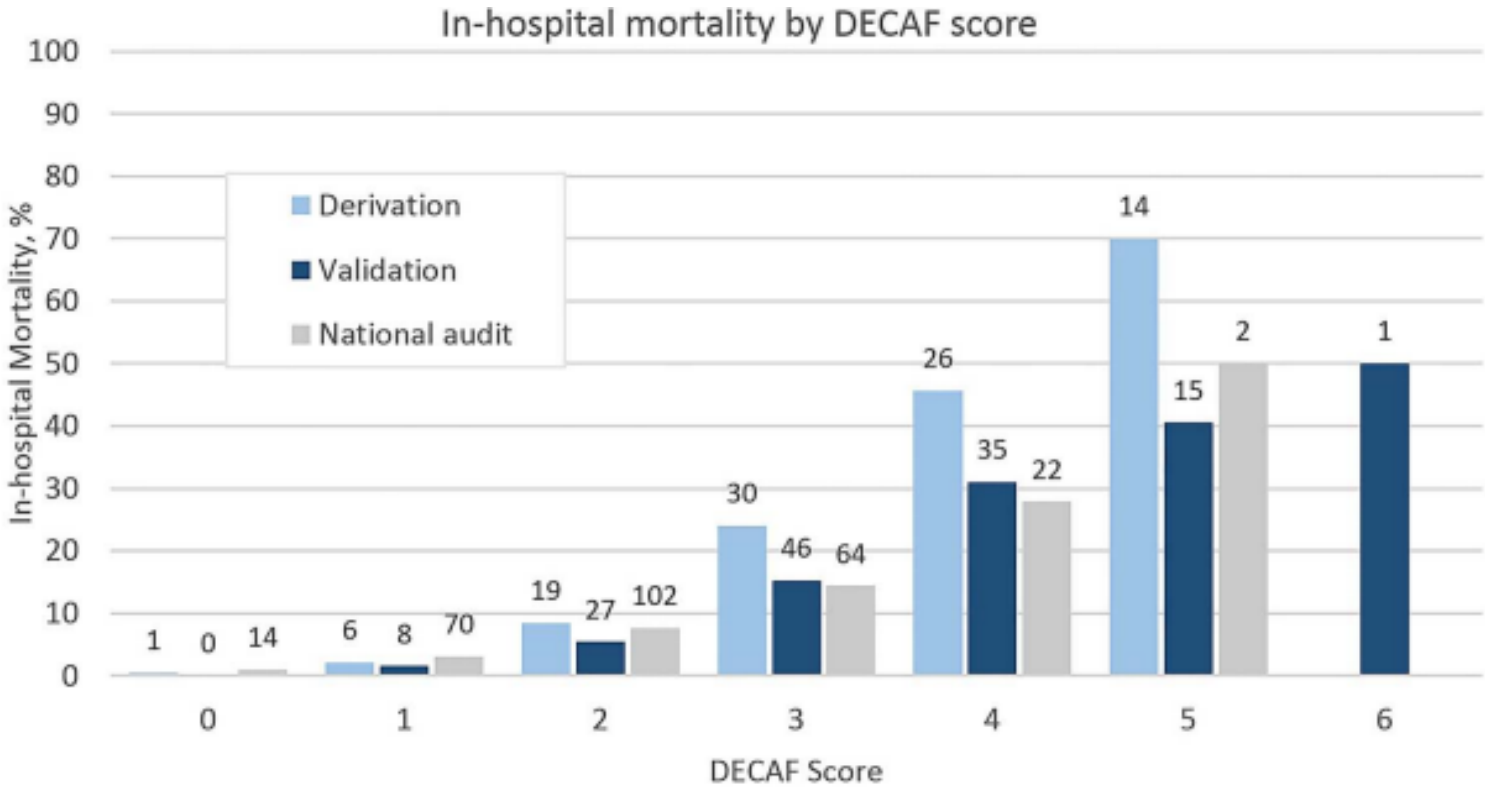


Figure 3 Inhospital mortality (percentage and absolute number) in the DECAF derivation and validation study from the 2014 UK National COPD Audit.

Emergency Department Disposition

Be Free:

- Low risk patients
- Reassuring walk test
- Social support
- Shared decision making

To Observation:

- Intermediate risk
- Needs serial treatments
- No social support
- Shared decision making

To Inpatient:

- High risk patient
- Requiring NIPPV
- Altered mental status
- Unable to ambulate or care for self
- Pregnancy > 20 weeks
- Shared decision making

Observation Criteria

Inclusion Criteria	• Intermediate response to adequate therapy in the ED • Chest x-ray without acute process • Alert, oriented, and stable VS • Pulse oximetry at baseline or need expected to resolve within 24 hours
Exclusion Criteria	• Poor response to ED therapy • High probability of airway intervention • Signs of respiratory distress • Need for NIPPV, Heliox, or HFNC • Altered mental status or unable to care for self • Concurrent acute conditions (pneumonia, CHF, ACS) • Pregnancy > 20 weeks

ACEP ACCELERATE

Observation Unit Evaluation

- Telemetry and continuous pulse oximetry as needed
- Walk test and peak flow evaluations as needed
- Treatment with oxygen, aerosols, IV steroids, IV antibiotics as needed
- Outpatient medication management (long term inhalers, oral steroids) as needed
- Smoking cessation and respiratory education
- Social work consultation as needed for assistance with discharge planning
- Pulmonology consultation as needed

Observation Order Set Example

- Admission/Monitoring
  - Vital Signs
    - ☐ Cardiac Monitoring
    - ☐ Pulse oximetry
      Routine, Continuous, Starting 12/3/24 Until Specified
    - ☑ Peak flow- pre and post treatment
      Routine, Every 12 hours, First occurrence tomorrow at 0800, Until Specified
    - ☐ Respiratory Care education
      Once
  - Care Interventions
    - Respiratory Interventions
  - Medications
    - Respiratory - albuterol (PROVENTIL) nebulizer solution
      - ○ albuterol (PROVENTIL) nebulizer solution 5 mg nebulization every 4 hours PRN wheezing ($)
        5 mg, nebulization, Every 4 hours PRN, wheezing
      - ◉ albuterol (PROVENTIL,VENTOLIN) nebulizer solution 5 mg ($)
        5 mg, nebulization, Every 6 hours PRN, wheezing, Starting today at 2223
        Implement INPATIENT/ED Bronchodilator Clinical Practice Guidelines? Yes
    - Steroids
      - ☐ methylPREDNISolone sodium succinate (Solu-MEDROL) 40 mg IV daily ($$)
        40 mg, intravenous, Daily, Starting 12/3/24, for 5 days
      - ☐ prednisoLONE (ORAPRED) 15 mg/5 mL (3 mg/mL) 45 mg oral daily ($)
        45 mg, oral, Daily
      - ☑ predniSONE (DELTASONE) tablet
        - ◉ predniSONE (DELTASONE) tablet 40 mg ($)
          40 mg, oral, Once, today at 2230, For 1 dose
          Look-alike/sound-alike medication - verify indication for use.
          Food-Drug Interaction Education Required

          May alter blood glucose or insulin requirements
          Take/give with food
          Look-alike/sound-alike medication - verify indication for use.
        - ○ predniSONE (DELTASONE) tablet 60 mg PO once ($)
          60 mg, oral, Once
  - Labs
    - Chemistry Basic
      - ☐ Blood Gas, Arterial ($$$$$)
      - ☐ Basic Metabolic Panel ($$$$$)
        Morning draw, Starting 12/4/24
      - ☐ CBC auto differential ($$$$$)
        Morning draw, Starting 12/4/24
      - ☐ D-Dimer ($$$$$)
      - ☐ Procalcitonin
      - ☐ Troponin I, High Sensitivity ($$$$$)
        Once

ACEP ACCELERATE

Observation Unit Disposition

Be Free:

- Reassuring exam including walk test and/or peak flow
- Negative workup in observation
- Able to follow up outpatient with pulmonology or PCP within 2 weeks
- Shared decision making

To Inpatient:

- Deterioration or unstable VS
- Lack of improvement in walk test and/or peak flow
- Requiring continued treatment with aerosols, IV medications
- Need for HFNC, NIPPV
- Shared decision making

Infectious Diseases

Examples: Cellulitis, Peritonsillar abscess, Pneumonia, Pyelonephritis

Background

- Patients with skin and soft tissue infections are often observed solely to receive IV antibiotics and can have few or no comorbid conditions
- Acute pyelonephritis accounts for approximately 200,000 hospitalizations annually in the United States
- Disease severity assessment in community acquired pneumonia is crucial to guide appropriate management
- Observation units are being increasingly utilized for intermediate risk patients and early goal directed therapy is beneficial

ACEP ACCELERATE

Emergency Department Evaluation

- Laboratory analysis (electrolytes, renal function, relevant cultures)
- Imaging of affected area or organ
- Drainage of abscess or local wound care if applicable
- Risk stratification

Risk Stratification

CURB-65 (Pneumonia):

- Confusion
- Urea >= 19
- Respiratory rate >= 30
- Low blood pressure
- Age >= 65

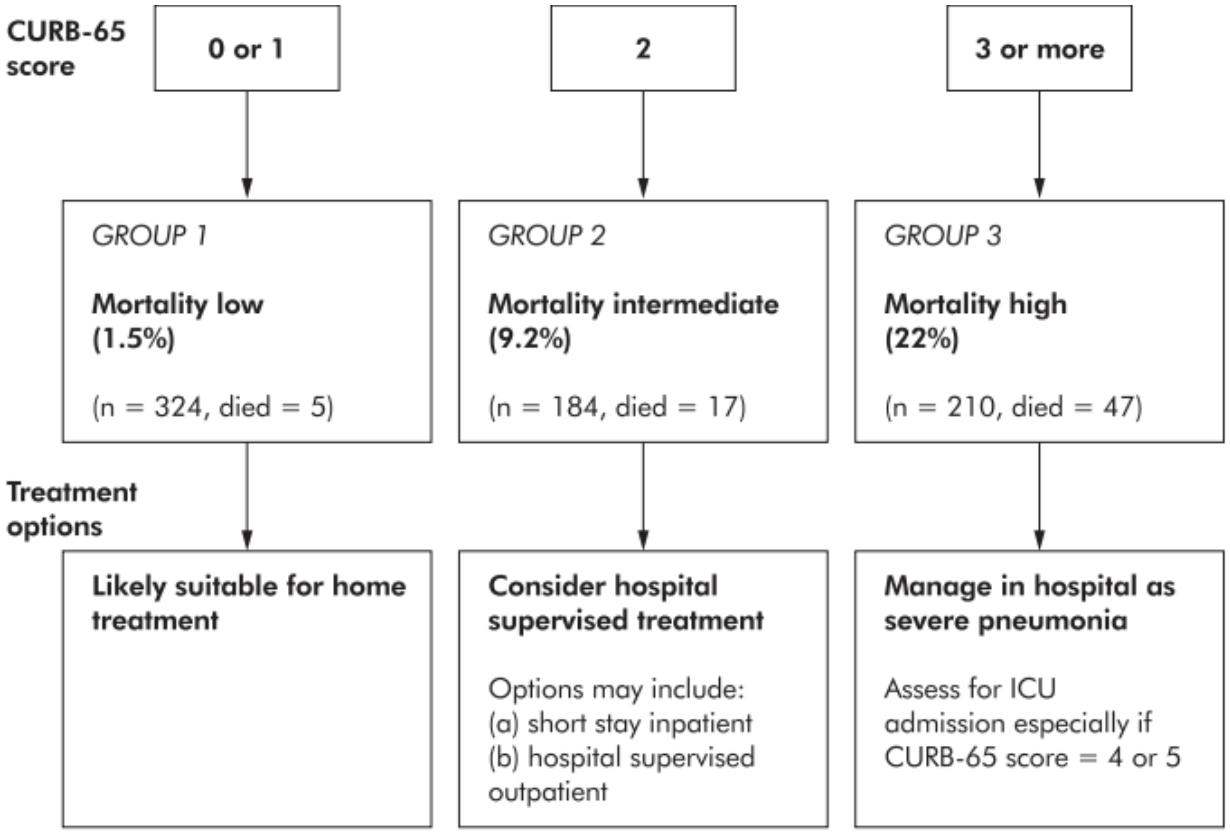


Figure 2 Severity assessment in a hospital setting: the CURB-65 score. One step strategy for stratifying patients with CAP into risk groups according to risk of mortality at 30 days when the results of blood urea are available.

Treatment Resources:

- Pharmacy
- Hospital formulary list
- Local resistance rates
- IDSA guidelines

TABLE 4: Initial Treatment for Hospitalized Patients with Community-Acquired Pneumonia (CAP) Stratified by Disease Severity and Risk for Antibiotic Resistant Pathogens[1]

(Note: Modify per hospital formulary and/or preferred antibiotics)

Allergy Alert‡: Use evidence-based validated risk strategies for evaluating β-lactam allergy and cross-reactivity to other β-lactams (add references). Patients with mild to moderate penicillin reactions[5] can typically tolerate non-pencillin β-lactams. Obtain a detailed history as these patients may be de-labled based on tolerated penicillin-class agents since the initial reaction[6]. Patients with immediate penicillin reactions (e.g., urticaria, angioedema, anaphylaxis) within 1 hour of β-lactam penicillin exposure may tolerate 3rd/4th generation cephalosporins or carbapenems[7]. Avoid β-lactams in patients with severe delayed cutaneous reactions (e.g., Stevens-Johnson syndrome, toxic epidermal necrolysis)[8].

	Standard Regimen		Recent hospitalization and parenteral antibiotics in the last 90 days	History of MRSA colonization or infection at any site within 1 year OR MRSA nasal PCR positive	History of P. aeruginosa colonization or infection at any site within 1 year OR Advanced structural lung disease	
Non-severe CAP	β-lactam PLUS Atypical Coverage (Preferred)		β-lactam PLUS Atypical Coverage (same as standard regimen)	MRSA Coverage	β-lactam PLUS Atypical Coverage	
	Choose One:	*Choose One:*		*Choose One:*	*Choose One:*	*Choose One:*
	Ampicillin/ sulbactam *1.5-3g IV q6h*	Azithromycin *500mg IV/PO q24h**		Vancomycin *per hospital guidelines*	Piperacillin/ tazobactam *4.5g IV q6h*	Azithromycin *500mg IV/PO q24h**
	Ceftriaxone *1-2g IV q24h (2g if >80kg)*[9,10]	Clarithromycin *500mg IV/PO q12h*		Linezolid *600 mg IV/PO*	Cefepime *2g IV q8h*	Clarithromycin *500mg IV/PO q12h*
	Cefotaxime *1-2g IV q8h*	Doxycycline *100mg IV/PO q12h***			Ceftazidime 2g IV q8h	Doxycycline 100mg IV/PO q12**
					Imipenem *500mg IV q6h*	Levofloxacin *750mg IV/PO q24h*
					Meropenem *1000mg IV q8h*	Moxifloxacin *400mg*
	Monotherapy (alternative if above regimen is not tolerated)					
	Choose One:					
	Levofloxacin *750mg IV/PO q24h*					
	Moxifloxacin 400mg *IV/PO q24h*					

Treatment Guidelines

ACEP ACCELERATE

Emergency Department Disposition

Be Free:

- Low risk patients
- Social support
- Close follow up in outpatient setting
- Shared decision making

To Observation:

- Intermediate risk
- Need for further IV treatment
- No social support
- Shared decision making

To Inpatient:

- High risk patient
- Unstable
- Concomitant systemic symptoms or signs of sepsis
- History of MDRO infection with high likelihood of long hospital stay
- Shared decision making

Observation Criteria

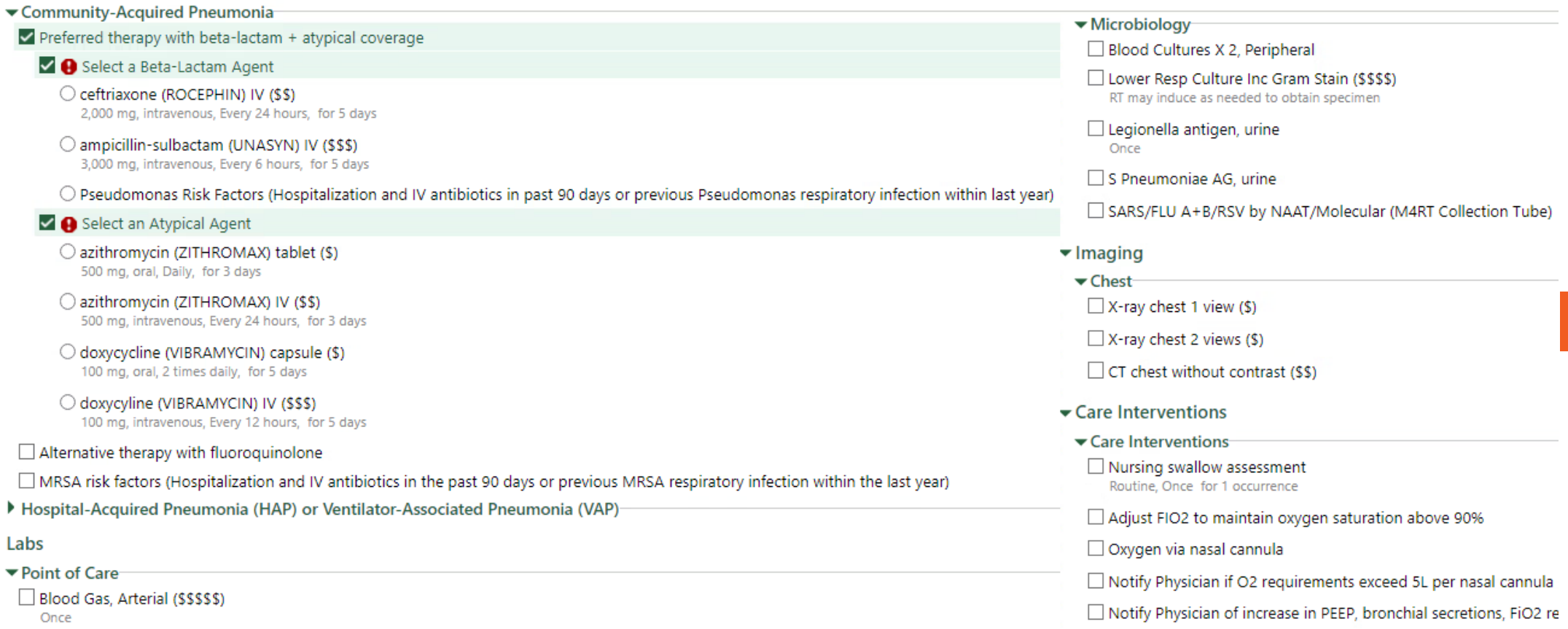
Inclusion Criteria	• Serial exams required to detect progression • Requires IV antibiotic treatment beyond that given in the ED • Hemodynamically stable
Exclusion Criteria	• Abnormal vital signs • High risk for respiratory or circulatory failure • Concern for complicated infection requiring prolonged treatment (diabetic foot infection, necrotizing infection, empyema, infected renal stone) • Altered mental status • Unable to ambulate or unable to care for self

ACEP ACCELERATE

Observation Unit Evaluation

- Serial labs and cultures (electrolytes, renal function, urine culture) as needed
- Serial examinations of infected area and/or organ
- Monitoring of response to current treatment and need for de-escalation/escalation
- Monitoring for systemic signs and symptoms indicating progression
- Medication management (prior authorization for oral antibiotic) as needed
- Social work consultation as needed for assistance with discharge planning
- Infectious disease consultation as indicated

Observation Order Set Example



ACEP ACCELERATE

Observation Unit Disposition

Be Free:

- Subjective improvement
- Reassuring exam
- Ability to obtain antibiotics outpatient
- Social support and follow up
- Shared decision making

To Inpatient:

- Poor response or persistent infection
- Systemic symptoms
- Fever or unstable VS
- No social support or inability to receive outpatient treatment
- Shared decision making

Conclusions

Risk stratification is important to appropriately disposition patients from the emergency department

An observation unit can decrease cost while managing intermediate risk patients appropriately

Further testing in the observation unit should be highly protocolized and driven by clinical picture and serial assessments

ACEP ACCELERATE

References
(ordered by appearance)

Goto T, Camargo CA Jr, Faridi MK, Yun BJ, Hasegawa K. Machine learning approaches for predicting disposition of asthma and COPD exacerbations in the ED. Am J Emerg Med. 2018 Sep;36(9):1650-1654.

Sengupta R, Loftus TM, Doers M, Jandarov RA, Phillips M, Ko J, Panos RJ, Zafar MA. Resting Borg score as a predictor of safe discharge of chronic obstructive pulmonary disease from the emergency department observation unit. Acad Emerg Med. 2020 Dec;27(12):1302-1311.

Högman M, Sulku J, Ställberg B, Janson C, Bröms K, Hedenström H, Lisspers K, Malinovschi A. 2017 Global Initiative for Chronic Obstructive Lung Disease reclassifies half of COPD subjects to lower risk group. Int J Chron Obstruct Pulmon Dis. 2018 Jan 3;13:165-173.

Zafar MA, Loftus TM, Palmer JP, Phillips M, Ko J, Ward SR, Foertsch M, Dalhover A, Doers ME, Mueller EW, Alessandrini EA, Panos RJ. COPD Care Bundle in Emergency Department Observation Unit Reduces Emergency Department Revisits. Respir Care. 2020 Jan;65(1):1-10.

Steer J, Gibson J, Bourke SC. The DECAF Score: predicting hospital mortality in exacerbations of chronic obstructive pulmonary disease. Thorax. 2012 Nov;67(11):970-6.

Helton B, MacWhinnie A, Minor SB, Lodise TP, Rafferty KD, Allison SL. Early Directed Oritavancin Therapy in the Emergency Department May Lead to Hospital Avoidance Compared to Standard Treatment for Acute Bacterial Skin and Skin Structure Infections: A Real-World Retrospective Analysis. Drugs Real World Outcomes. 2020 Jun;7(Suppl 1):20-29.

Herness J, Buttolph A, Hammer NC. Acute Pyelonephritis in Adults: Rapid Evidence Review. Am Fam Physician. 2020 Aug 1;102(3):173-180

Lim WS, van der Eerden MM, Laing R, Boersma WG, Karalus N, Town GI, Lewis SA, Macfarlane JT. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. Thorax. 2003 May;58(5):377-82.

Metlay JP, Waterer GW, Long AC, Anzueto A, Brozek J, Crothers K, Cooley LA, Dean NC, Fine MJ, Flanders SA, Griffin MR, Metersky ML, Musher DM, Restrepo MI, Whitney CG. Diagnosis and Treatment of Adults with Community-acquired Pneumonia. An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. Am J Respir Crit Care Med. 2019 Oct 1;200(7):e45-e67.