CLINICAL GUIDELINE FOR DIAGNOSIS, TREATMENT AND PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA

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Background:

The diagnosis of Ventilator Associated Pneumonia (VAP) is challenging, especially in the multi-trauma patient. While a set of CDC guidelines were updated in 2013 and a second set of guidelines were published in 2016 by IDSA, they can be a challenge to interpret and use with terminology such as "Ventilator Associated Events" and "Probable Ventilator Associated Pneumonia".[1] In victims of trauma, specifically both the diagnosis of VAP and the response to therapy can be misleading. VAP may be confused with (or even coexist with) existing pulmonary contusions, lobar collapse from atelectasis and other disease processes in trauma patients. Moreover, a trauma patient may have multiple reasons for febrile illnesses, many of which are non-infectious, and do not have always have a reliable response in their leukocyte count even in the presence of adequate VAP therapy.[2] This document provides tangible guidance for physicians in both the diagnosis and response to therapy for trauma patients who are suspected to have VAP.[3,4]

Management Algorithm

1. **DIAGNOSIS:** If a clinical suspicion of VAP exists, follow the diagnostic algorithm below
    a. Clinical suspicion of VAP should be prompted by the following:
    Mechanical ventilation >48 hours AND
        i. Abnormal temperature (>38C or <36C)
        ii. Abnormal WBC count (>12,000 or < 4,000 cells/mcl, or presence of >10% bands)
        iii. Macroscopically purulent sputum

    PLUS

        iv. Decline in oxygenation OR
        v. New or changing infiltrate on CXR
    b. Quantitative culture should be used to diagnose VAP
        i. A bronch BAL (or blind BAL performed by a trained respiratory therapist utilizing a standardized technique) should be done prior to empiric therapy initiation when feasible. The aspirate should be sent for **quantitative culture;** >100,000 CFU is considered positive
        ii. If feasible, or clinically indicated for therapeutic intervention, a bronchoscopy with BAL may be completed. The aspirate should be sent for **quantitative culture**

iii. Tracheal aspirates should **NOT** be used to diagnose VAP. If, however, a tracheal aspirate is sent and quantitated, the threshold for therapy should be >100,000 CFU. **NON-QUANTITATED TRACHEAL ASPIRATES SHOULD NOT BE TREATED**

2. **TREATMENT:**
    a. Empiric antibiotics are dictated by the patient's risk for healthcare associated organisms.
        i. Risk factors for MDR VAP include: Prior IV antibiotic use within 90 days, septic shock at time of VAP, ARDS preceding VAP, 5+ days of hospitalization prior to the occurrence of VAP, Acute renal replacement therapy prior to VAP onset
    b. Empiric antibiotics are tailored or discontinued as appropriate once culture results are available.
    c. Based on the 2016 IDSA guidelines, treatment durations for all patients with a diagnosed VAP should be treated with a short course of antibiotics (7-8 days)[5]. Day 1 of this therapy would be the first day of adequate antibiotic coverage according to final sensitivities.
    d. Consider consulting Infectious Disease for Stenotrophomonas or MDR pathogens that might require extended treatment.

3. **PREVENTION:**

While the above is meant to promptly diagnose and treat VAP, the presence of VAP still confers an increase in hospital length of stay and costs. The below guidelines are methods used to prevent the development of VAP.

a. Routine hand hygiene by care team (monitored and reported by Hospital Epidemiology)
b. HOB elevated to 30 degrees unless contraindicated
c. Ventilator circuits are changed every 7 days or if soiled/damaged, circuit changes are documented in EMR
d. Oral chlorhexidine (CHG) and oral care per hospital protocol
e. Closed suction is used on all ventilators with attempts to limit ventilator disconnections
f. Endotracheal cuff pressure is monitored each shift and documented in EMR
g. SBT/SAT per ICU protocol
h. With transports, suctioning is performed prior to and with return from transport; transport is accomplished with closed suction in the circuit

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