

**DRUG THERAPY GUIDELINES:****ANTIBIOTICS IN THE SURGICAL INTENSIVE CARE UNIT (SICU) PATIENT**

Prepared by: Surgical/Critical Care Pharmacists/5/91/Updated 10/94, 5/98

The following guidelines have been developed to assist physicians with the appropriate selection of prophylactic and empiric antibiotic therapy for potential and common infections seen in SICU patients at UCSD. These guidelines were developed with knowledge of "nosocomial" pathogens seen in this unit. Treatment should be directed by patient-specific parameters which include gram stain, culture and sensitivity information when they are known, previous infectious diseases and antibiotic courses, and other pertinent medical history, including drug allergies. Duration of antibiotic treatment should be based on specific organism(s), site of infection, and clinical scenario. The drug(s) of choice listed below are the most active, least toxic and most cost-effective agents currently on the UCSD Formulary (except where noted). Dosing guidelines are for patients with "normal" renal and liver function. Many antibiotic dosages must be adjusted with altered renal function. Infectious Disease consultation should be obtained for patients with unusual isolates, complicated infectious disease management problems, and those who are responding poorly to empiric therapy. When ordering intravenous antibiotics, the "Antibiotic Order Form" must be completed prior to administration of antimicrobial therapy.

**\*\* = adjust for renal function**

PROPHYLAXIS: POST CORONARY ARTERY BYPASS GRAFT AND/OR

I. HEART VALVE REPLACEMENT--CEFUROXIME: 1.5 GM IV q 12 h x 24 – 48 hrs\*\*

*Alternative therapy if patient allergic to penicillins or cephalosporins:\*\**

*VANCOMYCIN: patient-specific dose; usual 15 mg/kg IV q 12 h*

(Some surgeons recommend this regimen for 72 hrs or until chest tube(s) pulled)

-adjust dose for altered renal function

II. **PROPHYLAXIS: POST VENTRICULOSTOMY OR CAMINO PLACEMENT**

No prophylactic antibiotic therapy

III. **PROPHYLAXIS: POSTTRAUMATIC OPEN FRACTURE \*\***

CEFAZOLIN: 1gm IV q 8 h

OR

CEFAZOLIN: 1gm IV q 8 h **Plus** GENTAMICIN:patient specific dose;usual dose 5 mg IV q 24 h

(Levels are only needed for treatment > 5 days)

-adjust dose for altered renal function

*Alternative therapy if patient is allergic to penicillins or cephalosporins*

*VANCOMYCIN: patient-specific dose; usual 15 mg/kg IV q 12 h*

*Plus/Minus GENTAMICIN: dosing as above*

IV. **PROPHYLAXIS:POST ABDOMINAL TRAUMA AND/OR SURGICAL PROCEDURE**

CEFOTETAN: 1 gm IV q 12 h - one dose pre-op and continue x 12-24 hrs post surgical procedure or definitive therapy based upon operative findings.\*\*

*Alternative therapy if allergic to penicillins or cephalosporins:\_CLINDAMYCIN: 600 mg IV q 8 h Plus GENTAMICIN:patient-specific dose; usual dose 5 mg/kg IV q 24 h (Levels are only needed for treatment > 5 days)*

**V. EMPIRIC THERAPY: PNEUMONIA:** Empiric antibiotics are based on patient-specific clinical information, gram stain of sputum and preliminary isolate(s) culture results. Pneumonia, with few exceptions, requires the presence of a new/changing air-space opacity on CXR – it must be remembered that there is a large differential diagnosis of air-space opacities (edema, hemorrhage, PE, etc.). Therapy should be adjusted according to cumulative antibiotic sensitivity information.

**A. HOSPITAL ACQUIRED PNEUMONIA (>72 h post admission) GRAM POSITIVE COCCI ONLY (*Staphylococcus* or *Streptococcus*):**

CEFAZOLIN: 1 gm IV q 8 h\*\*

*Alternative therapy if allergic to penicillins or cephalosporins: VANCOMYCIN: patient-specific dose; usual 15 mg/kg IV q 12 h*

Note: Gram positive cocci should no longer be presumed to be methicillin-resistant *Staphylococcus aureus* (MRSA). The current finding at UCSD Medical Center is that MRSA accounts for less than 10% of all *Staphylococcus aureus* isolates.

**-GRAM NEGATIVE RODS (predominantly):** PIPERACILLIN 4-5 gm IV q 8 h  
OR

CEFTAZIDIME 1 gm IV q 8 h\*\* Plus/Minus GENTAMICIN: patient-specific dose; 5 mg/kg IV q 24 h

Note: Once culture result negative for *Pseudomonas*, switch to non-ceftazidime gram negative therapy, i.e., ceftriaxone or SMX/TMP.

**B. HOSPITAL-ACQUIRED PNEUMONIA WITH KNOWN OR SUSPECTED ASPIRATION - Guidelines as above with additional coverage for anaerobes:**

CLINDAMYCIN: 600 mg IV q 8 h

-if using imipenem-cilistatin, no further anaerobic coverage is needed

**SUPPLEMENT FOR EMPIRIC THERAPY: HOSPITAL-ACQUIRED PNEUMONIA**

Known sensitivity patterns for the following GRAM NEGATIVE RODS that predominate in the SICU may help direct therapy (per current cumulative antibiogram)

- 1) **Suspected infection with *Enterobacter aerogenes* or *E. cloacae*.** *Instead of Piperacillin or ceftazidime plus/minus gentamicin use:*  
*GENTAMICIN: patient-specific dose; 5 mg/kg q 24 h Plus*  
*SULFAMETHOXAZOLE/TRIMETHOPRIM: 5mg/kg IV q 12 h*  
*(desire approximately 10 mg/kg/day trimethoprim)*

Note: Resistance of *Enterobacter* sp. to 3<sup>rd</sup> generation cephalosporins on the rise in ICU patients. (Once the patient is stable can treat with SMX/TMP as a "single agent", i.e. DC gentamicin)

- 1) **Suspect infection with *Pseudomonas aeruginosa* use:** GENTAMICIN (same dose as above) Plus PIPERACILLIN 4-5 gm IV q 8 h  
OR CEFTAZIDIME 1gm IV q 8 h+

*Note: Once culture result negative for *Pseudomonas*, switch to non-ceftazidime gram negative therapy, i.e., ceftriaxone or SMX/TMP.*

- 2) **Suspect: *Legionella pneumophila* (very rare at UCSD):**  
ERYTHROMYCIN: 1 gm IV q 6 h

**VI. EMPIRIC THERAPY FOR FUNGAL INFECTIONS**

**A. PROPHYLAXIS: FUNGAL OVERGROWTH ON MUCOUS MEMBRANES**

IS OFTEN SEEN AFTER ADMINISTRATION OF BROAD-SPECTRUM ANTIBIOTICS AND DOES NOT NECESSARILY REQUIRE TREATMENT  
NYSTATIN: 5-10cc oral swish and swallow qid

- B. **CANDIDA CYSTITIS:** In most patients Candida cystitis will resolve spontaneously without treatment. Except in neutropenic patients, Candida in the bladder rarely disseminates and does not infect the kidneys. If for some reason you wish to eradicate Candida in patients with Foley catheters:  
AMPHOTERICIN B: 20mg in 200cc sterile water; infuse into bladder q d for 3-5 days - Elase (4 vials) must be added to the first bladder wash only
- C. **DISSEMINATED FUNGAL INFECTION OR SYSTEMIC DISEASE**  
SUSPECTED: Suspect systemic disease with:
- Positive blood cultures (<50% sensitive).
  - Multiple deep site isolation in a patient with fevers and not doing clinically well.
  - Isolation from urine plus wound or multiple sites.

Note: Isolated positive sputum for *C. albicans* is not an indication for anti-fungal therapy.

AMPHOTERICIN B 0.3 – 1 mg/kg every day (until sensitivities established) Give test dose of 1 mg in 50 cc of D5W infused over 20-30 minutes. If tolerated, infuse 0.25 mg/kg in 250cc D5W over 2-4 hours. Add hydrocortisone 25 mg and heparin 500 – 1000 units, if given peripherally. In 12-24 hours later, if tolerated, infuse mg/kg maintenance dose in 250cc D5W over 2-4 hrs with hydrocortisone and heparin as previously indicated.

-- monitor renal function, serum magnesium and potassium during treatment

Note: At UCSD Medical Center, the recent emergence of *Candida species* resistant to fluconazole limits its use for general empiric treatment for early presumptive fungal infections. The use of liposomal amphotericin products require a mandatory Infectious Diseases Attending approval PRIOR to use.

INFECTIOUS DISEASE CONSULTATIONS SHOULD BE OBTAINED FOR PATIENTS WITH UNUSUAL ISOLATES, INFECTIOUS DISEASE MANAGEMENT PROBLEMS, AND FOR THOSE WHO ARE RESPONDING POORLY TO EMPIRIC THERAPY

#### ⌘ SICU Drug Therapy Guidelines (5/98)

These guidelines are UCSD institution specific and were adapted from: Arch Surg 1993;128:79-88, NEJM 1986;315(18):1129-38, and Am J Respir Crit Care Med 1996;153:1711-25. ⌘