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## INFO-CONNECT

### Infections in Long-Term Care Facilities

#### The Facts...

- ⇒ Infections are an important source of morbidity and mortality among residents of long-term care facilities (LTCF).
- ⇒ Over 1.5 million infections occur annually in LTCF in the United States, or approximately 1 to 2 infections per resident each year.
- ⇒ Nearly one-quarter of hospital admissions from LTCF are due to infections.
- ⇒ The most common infections in LTCF residents are bacterial pneumonia, urinary tract, and skin/soft tissue infections.

#### RISK FACTORS FOR INFECTION

Underlying diseases:

- Dementia
- Diabetes
- Congestive heart failure
- Chronic lung disease
- Urinary obstruction or incontinence

Functional impairments:

- Decreased mobility
- Incontinence of bowel and bladder
- Self-care dependence

Changes of aging:

- Thin fragile skin
- Impaired cough
- Enlarged prostate

Medical devices:

- Enteral feeding tubes
- Foley catheters

Polypharmacy:

- Sedatives
- Anticholinergics

Malnutrition:

- Delays in diagnosis and treatment due to atypical clinical presentation

#### COMMON SIGNS OF INFECTION

Elders can have infections and remain afebrile.

Changes in mental status or loss of ADLs are common in elderly patients with infections:

- Acute confusion or delirium
- Unexplained change in behavior pattern
- Unexplained change in functional status
- Loss of appetite
- Unexplained weight loss
- Weakness
- Lethargy
- Urinary incontinence
- Falls
- Rapid respiratory rate
- Orthostatic hypotension

#### BACTERIAL PNEUMONIA

- The usual clinical symptoms and signs of pneumonia are fever, chills, cough, sputum production, rales, and rhonchi. The usual signs may be absent or replaced in the LTCF residents by neurologic (acute confusion) or gastrointestinal symptoms (anorexia, nausea, vomiting).
- Pneumonia in patients residing in LTCF is classified as a health-care associated pneumonia (HCAP) rather than community acquired pneumonia (CAP). Patients with HCAP are at risk for pneumonia with multi-drug resistant pathogens.
- The most common bacterial causes of pneumonia in LTCF are *Streptococcus pneumoniae*, *Staphylococcus aureus* (including MRSA), *Klebsiella pneumoniae*, and bacteria.
- Supine patient positioning may facilitate aspiration of oropharyngeal organisms and food.
- Not all residents benefit from transfer to a hospital for treatment. Hospitalization may lead to serious adverse consequences for some nursing home residents, including the development of immobility, urinary catheterization, pressure ulcers, delirium, and increased functional dependence.
- The decision to hospitalize depends on the severity of illness and the facilities available in the nursing home.
- Many patients in nursing homes may be treated with oral antibiotics if their infection is mild and they suffer few other serious illnesses, such as heart or lung disease.

## ORAL TREATMENT OF BACTERIAL PNEUMONIA

Respiratory fluoroquinolone:  
moxifloxacin 400 mg daily  
levofloxacin 750 mg daily

or

high-dose b-lactam (with macrolide):  
beta-lactam:  
amoxicillin 1 g three times daily  
amox-clavulanate 2 g twice daily  
macrolide:  
azithromycin 500 mg once, followed by  
250 mg daily for 4 additional doses  
clarithromycin 500 mg twice daily

## PARENTERAL TREATMENT OF BACTERIAL PNEUMONIA

Antipseudomonal cephalosporin:  
Cefotaxime 1 gm every 8 hours.  
cefepime 1-2 g every 8-12 hours  
ceftazidime 1-2 g every 8-12 hours  
or b-lactam-b-lactamase inhibitor combination:  
Piperacillin Tazobactam 4.5 gm IV every  
6 hours.  
plus antipseudomonal fluoroquinolone  
ciprofloxacin 400 mg every 8 hrs  
levofloxacin 750 mg daily  
or  
Aminoglycoside  
tobramycin 7 mg/kg daily  
or antipseudomonal carbapenem  
imipenem 500 mg every 6 hours  
meropenem 500 mg every 6 hrs  
doripenem 500 mg every 8 hrs

## PREVENTION

- ⇒ The Advisory Committee on Immunization Practices (ACIP) recommends that all persons aged 65 years and older or anyone, regardless of age, at increased risk of pneumococcal disease and its complications because of chronic illness, should be immunized once with the pneumococcal vaccine. Revaccinate once after 5 years.
- ⇒ Bacterial pneumonia is a common sequela of influenza illness. Consequently, vaccination against influenza is an important step in preventing pneumococcal infections and should occur yearly for residents of long-term care facilities as well as the healthcare workers caring for them.
- ⇒ If an outbreak of influenza occurs in the long-term care facility, chemoprophylaxis should be administered to all well residents and staff, regardless of their vaccination status.

## URINARY TRACT INFECTIONS

- Urinary tract infection is the most common infection in LTCF residents.
- UTIs in LTCF residents may be asymptomatic, and truly asymptomatic.
- UTIs may not need antibiotic treatment.
- Typical complaints of UTI are fever, dysuria, frequency, nocturia, and urgency. LTCF residents may alternatively manifest symptoms of dizziness, acute confusion, falls, anorexia, nausea, or general functional deterioration.

- Common bacteria responsible for UTI in non-catheterized, LTCF residents are primarily enteric Gram-negative bacilli such as *Escherichia coli*, *Klebsiella* spp., *Proteus* spp., *Enterobacter* spp., *Citrobacter* spp., *Serratia* spp., and *Pseudomonas* spp. Chronic indwelling catheters also predispose patients to infection with *Enterococcus* spp.
- The choice of antimicrobial therapy for UTI should be determined by the severity of clinical manifestations, and anticipated or identified pathogens. Asymptomatic bacteriuria, with or without catheterization, generally DOES NOT require antimicrobial therapy.

Clinical Condition	Empiric Regimen
Ambulatory, non-catheterized, stable	Trimethoprim-sulfamethoxazole (160/800) BID, or Amoxicillin-clavulanic acid 875/125 mg BID, or Cefuroxime axetil 250 mg BID, or Cefadroxil 500 mg qd/BID, or Levofloxacin 250 mg qd, or Ciprofloxacin 250 mg BID <b>Alternatives:</b> Nitrofurantoin 50 mg qid, or 100 mg BID Doxycycline 100 mg BID
Hospitalized, catheterized, unstable	Second- or third-generation parenteral cephalosporin or Ticarcillin-clavulanic acid, or Ampicillin-sulbactam, or Fluoroquinolone, or Ureidopenicillin (piperacillin, azlocillin or mezlocillin) and/or Aminoglycoside

# SKIN AND SOFT TISSUE INFECTIONS

- Pressure ulcers are largely preventable, and the reported frequency directly reflects the quality of nursing care.
- Immobility, sensory impairment, incontinence of bladder or bowel, and poor nutrition are the major risk factors for the development of pressure ulcers.
- It is important in high risk, limited mobility patients that their position be changed every two to three hours, making sure to rotate the position by twenty or thirty degrees to relieve pressure at critical areas.
- Surface cultures are generally considered useless in identifying presence of infection or identifying pathogens present.
- The use of topical antibiotics and disinfectants such as a dilute sodium hypochlorite (Dakin's) solution, povidone iodine, acetic acid solutions, hydrogen peroxide or an aminoglycoside solution for irrigation to reduce skin colonization in order to prevent the likelihood of infection are no longer recommended. These preparations may actually impair wound healing due to their cytotoxic effects.
- Normal saline is generally recommended to keep the ulcer moist and is recommended for most circumstances.
- Systemic antibiotics are not required in patients with evidence of active local infection (purulence, erythema, swelling) without systemic signs.
- In cases of cellulitis, sepsis, or osteomyelitis resulting from an infected pressure ulcer, parenteral antibiotics are warranted.
- When Staph aureus infection is suspected, therapy directed toward MRSA should be considered due to the high prevalence of community acquired MRSA.

Clinical Condition	Empiric Regimen
Infected pressure sores with systemic signs of infection	b-lactam/b-lactamase inhibitor combination Imipenem 500 mg every 6 hours Meropenem 1 gm every 8 hours Quinolone plus clindamycin 600 mg or Metronidazole 500 mg every 8 hours
Cellulitis Non-diabetic, mild/moderate	Dicloxacillin 500 mg every 6 hours cephalexin 500 mg every 6 hours Nafcillin or Oxacillin 2 gm every 4 hours Cefazolin 1 gm every 8 hours
Suspected MRSA	doxycycline or minocycline 100 mg twice daily TMP/SMZ DS 1 or 2 twice daily clindamycin 300-450 mg three times daily inezolid 600 mg twice daily vancomycin or daptomycin if parenteral as need
Diabetic, mild	Second- or third-generation cephalosporin amoxicillin/clavulanate 825/125 mg twice daily
Diabetic, moderate/severe	Ticarcillin/clavulanate 3.1 gm every 6 hours Piperacillin/tazobactam 3.375 gm every 8 hours Imipenem 500 mg every 6 hours ertapenem 1 gm daily Meropenem 1 gm every 8 hours Quinolone plus clindamycin 600 mg or Metronidazole 500 mg every 8 hours

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