Clinical Practice Guideline: 
**PNEUMONIA**
*Type: Medical Diagnosis/Treatment/Procedure*
*Target Population: Adult/Geriatric*

### PROFESSIONAL PROCESS

#### GOALS/OUTCOMES:

A. Signs and symptoms of listed potential problems will be absent or manageable.

1. Hypoxia/Hypoxemia
2. Infection leading to Sepsis
3. Fluid Imbalance
4. Undernutrition
5. Acute Pain
6. Situational Response

B. Patient/family/significant other (S.O.)/caregiver will verbalize and/or demonstrate an understanding of teaching/learning goals listed below: (Refer to Education Outcome Record)

1. Pneumonia overview [e.g., description, anatomy, physiology, cause(s)].
2. Signs/symptoms (e.g., fever; chills; cough, production of mucous, sometimes blood-tinged; shortness of breath; chest pain, especially when taking breath; muscle aches; tiredness; confusion, decrease in physical activity in elderly).
3. Treatment plan [e.g., Medications: antibiotics, analgesics; Diet: as tolerated, fluids; Activity: rest, positioning to decrease work of breathing; Treatments: oxygen therapy, pulmonary hygiene (coughing, deep breathing, incentive spirometry, suctioning); intravenous fluids, humidifier].
4. Modifiable risk factors/triggers (e.g., exposure to infection, impaired immune system, pre-existing illness, aspiration, recent surgery with general anesthesia).
5. Self-management [e.g., medication management; balance rest and activity; positioning to decrease work of breathing; avoid tobacco use/exposure; immunization (Influenza vaccine, Pneumovax); healthy diet, fluid intake; regular exercise; infection prevention].
6. When to seek medical attention [e.g., difficulty breathing; persistent pain; signs/symptoms of infection (fever greater than 100.5 degrees Fahrenheit/38 degrees Celsius)].
7. General goals (room/unit routine, pain, medication, diagnostic tests/procedures, dietary modifications, hygiene, infection prevention, rehabilitation, medical equipment/supplies, tobacco cessation, resources for support).

#### ASSESSMENT/INTERVENTIONS/CLINICAL REASONING/DECISION-MAKING:

A. Assess and document readiness and ability to learn, learning needs and preferences. (Refer to Pre-Teaching Assessment on Education Outcome Record)

B. Collaborate with interdisciplinary resources related to significant changes in patient status and for the continuum of care (e.g., Primary Care Physician/Pulmonologist, Nursing, Social Work/Services, Dietitian/Nutrition Services, Pastoral Care, Pharmacy, Respiratory Therapy Child Life, Speech Language Pathology, Home Care Services).

C. Assess, Monitor, and Detect:

- The impact of other pre-existing health problems.
- The impact on psychosocial, cultural, sexual, developmental and spiritual well-being.
- The impact of common diagnostic studies/laboratory values [e.g., chest x-ray (CXR), arterial blood gases (ABGs) or oximetry, sputum culture and sensitivity, blood cultures x 2, serum glucose and electrolytes, white blood cells (WBCs), C-reactive protein (CRP), sedimentation rate (Sed Rate), serum liver chemistries/renal function tests, urinary antigen test for Legionella or pneumococcal pneumonia, nasal swab for the methicillin-resistant Staphylococcus aureus (MRSA) polymerase chain reaction (PCR) test].
- Baseline vital signs and trends.
- Risks to safety.

D. Assess, Monitor, Detect, Prevent and/or Modify the listed potential problems and implement interventions as appropriate:

**Hypoxia/Hypoxemia** AEB (As Evidenced By): (31; 54)

- increased respiratory effort, use of accessory muscles, nasal flaring, retractions, complaints of dyspnea; cyanosis, pallor, mottling; decreased capillary refill; diaphoresis; cool, clammy skin; increased or decreased heart rate (HR); increased respiratory rate (RR); increased or decreased BP; increased pulse pressure; dysrhythmia; change in breath sounds; restlessness, anxiety; headache; somnolence; dizziness; confusion; loss of consciousness; fatigue, weakness; decreased partial pressure of arterial oxygen (PaO₂); decreased percent peripheral pulse oxygen (O₂) concentration (SpO₂); decreased pH; decreased then increased partial pressure of carbon dioxide (PCO₂); decreased percent venous O₂ saturation (SVCO₂); increased in end-tidal carbon dioxide (EtCO₂); decreased minute volume ventilation
• **Pneumonia** AEB: (4; 10; 23; 31; 51; 63; 64; 84) shortness of breath (SOB); cough (with or without sputum); changed secretions; increased temperature lasting more than 72 hours; diaphoresis/night sweats; chills; rigor; tachypnea, dyspnea; increased use of accessory muscles; fatigue, malaise; myalgias; anorexia; nausea/vomiting (NV); decreased, dull or bronchial breath sounds in affected area; wheezing; pleuritic chest pain; restlessness; impaired consciousness; skin rash; cyanosis; changed ABGs [e.g., decreased partial pressure arterial O₂ (PO₂), decreased partial pressure carbon dioxide (PCO₂), followed by increased PCO₂ in the case of muscle fatigue/airway obstruction]; change in CXR; positive sputum culture/Gram stain; increased WBC; change in CBC; elevated serum liver chemistries/renal function tests; change in serum electrolyte levels; positive urinary antigen test for Legionella or pneumococcal pneumonia; nasal swab for the methicillin-resistant Staphylococcus aureus (MRSA) polymerase chain reaction (PCR) test

• **Geriatric**: above signs/symptoms as well as worsening of chronic underlying illness; confusion (63)

1. Correlate respiratory status to age, vital signs (VS), cardiac status, level of consciousness, laboratory/diagnostic tests, medications, antibiotic therapy, pain level, procedure/treatment/surgery positioning, airway patency/aspiration risk, activity patterns/tolerance, sleep/rest patterns, ventilator status and baseline assessment data. (4; 31; 64) Grade C
2. Identify change in respiratory secretions and correlate to hydration status, laboratory values, sputum/secretion cultures, activity patterns, treatments, medications (e.g., antibiotics) and respiratory status. (31) Grade C
3. Position/reposition to promote maximum ventilation/perfusion, mobilization of secretions, comfort and safety. (4; 31; 84) Grade C
4. Anticipate need for O₂ or respiratory support [e.g., bronchodilators, chest physiotherapy (CPT), noninvasive (preferred) or invasive mechanical ventilation]. (4; 31; 51; 64; 84) Grade A
5. Elevate head of bed (HOB) to semirecumbent position (30 to 45 degrees) to prevent aspiration, especially when receiving enteral feeding or mechanical ventilation. (51; 64; 84) Grade A
6. Maintain patent airway (e.g., pulmonary hygiene, humidification, suctioning, artificial airway placement). (54) Grade A
7. Anticipate collection of cultures (e.g., blood, urine and sputum/secretion) prior to administration of antibiotics. (4; 51; 64) Grade A
8. Promote rest and minimize O₂ consumption (e.g., allow for rest periods, coordinate/cluster care, match activity with patient’s ability/tolerance, passive range of motion, neutral thermal environment, stress-reduction strategies). (31) Grade C
9. Provide adequate pain control (e.g., medications, relaxation techniques, splinting chest while coughing). (23; 31) Grade C
10. Monitor and maintain optimal hydration (e.g., encourage oral fluids, IV fluids when indicated, monitor intake/output). (88) Grade C
11. Maintain euglycemia to decrease risk of healthcare-associated blood stream infection and duration of mechanical ventilation. (64) Grade A
12. Promote preventive measures [e.g., ambulation/activity, cough and deep breathing, incentive spirometry, adequate hydration, hand hygiene (washing/alcohol-based hand disinfection), oral hygiene]. (4; 51; 84) Grade C
13. Evaluate need for pneumococcal and influenza vaccination. (4; 31; 51; 84) Grade A
14. Refer patient to tobacco cessation program, when indicated. (4; 23; 31; 51) Grade C

**Infection leading to Sepsis** AEB: (37)

• **Infection**: fever; pain/tenderness; localized swelling, redness, heat; changed bowel/bladder function; delayed wound healing; purulent drainage; abscess; positive cultures

• **Sepsis**: fever or hypothermia; decreased BP; oliguria; increased HR; increased RR; decreased PCO₂; change in white blood cell count (WBCs); increased bands

• **Geriatric**: change in mental status may be the only symptom of infection in the elderly

15. Correlate clinical status with age, VS, signs of local/systemic infection, exposures, medications, procedures/treatments/surgery, immunologic/nutritional status, invasive devices (e.g., intubation) and baseline assessment data. (37; 52; 81) Grade B
16. Implement precautions to prevent transmission of infectious agents in the healthcare environment (e.g., hand hygiene, standard precautions, monitor visitors, barrier precautions, transmission-based precautions). (3; 52; 81) Grade B
17. Identify conditions, treatments, diet and medications that may lower resistance to infection; promote changes/additions that increase resistance and/or reduce recurrent infection. (25; 28; 45; 48; 59) Grade A
18. For critically ill patients, evaluate and monitor blood glucose levels (e.g., goal less than 180 mg/dL); advocate for appropriate treatment (e.g., maintain blood glucose levels between 140 to 180 mg/dL, utilize validated insulin infusion protocol, maintain IV insulin therapy, anticipate frequent blood sugar monitoring to prevent hypoglycemia). (61) Grade C
19. For noncritically ill patients, evaluate and monitor blood glucose levels (e.g., premeal blood glucose goal less than 140 mg/dL; random blood glucose goal less than 180 mg/dL), advocate for appropriate treatment (e.g., individualize blood glucose targets based on previous diagnosis of diabetes and/or control and/or medical status (end of life, brittle diabetes), anticipate use of scheduled subcutaneous administration of insulin with basal, nutritional and correction doses, ongoing blood sugar monitoring and assessment to prevent over/under treatment). (61) Grade C
20. Implement measures to prevent infection from central venous/arterial catheters (e.g., optimal catheter site selection, barrier precautions upon insertion, chlorhexidine skin antisepsis, daily review of line necessity and prompt removal of unnecessary lines). (40) Grade B
21. Implement measures to prevent infection from indwelling urinary catheters (e.g., avoid unnecessary catheterization, insert catheter aseptically and remove when no longer needed, closed drainage system, drainage bag below bladder level, unobstructed urine flow, closed technique for specimen collection, secure tubing). {Grade C}

22. Assess for signs of localized infection [e.g., invasive lines, urinary tract, gastrointestinal (GI) tract, respiratory tract, surgical sites]. {Grade B}

23. Evaluate/anticipate need for cultures (e.g., blood, urine, stool, wound, cerebrospinal fluid, respiratory, drainage, invasive devices, indwelling lines) before antimicrobial therapy is initiated. {Grade B}

24. Provide comfort/fever-reduction measures (e.g., medications, cool cloths, lightweight clothing/covers, change room temperature, decrease stimulation, change ventilator/aerosol temperature). {Grade C}

25. Promote patient/family behaviors that reduce endogenous flora and enhance host defenses (e.g., hand hygiene, pulmonary hygiene, personal hygiene, diet/hydration, mouth/dental care). {Grade B}

26. Facilitate briefest possible hospital stay. {Grade B}

27. Evaluate/anticipate need for medications (e.g., uroseptic, antibiotic, probiotic, antiviral, antifungal, antipyretic, immune globulin, interferon, steroid). {Grade B}

28. Assist with measures to diagnose/treat early sepsis (e.g., two or more blood cultures; percutaneous blood culture; blood culture from each vascular access device, imaging studies to confirm source of infection, early IV antibiotic therapy, remove infected IV access devices, volume resuscitation to restore normal perfusion pressure and hemodynamic function, protect the airway, ventilation, oxygenation, monitor potential nephrotoxic medication). {Grade C}

29. Anticipate need for surgical intervention (e.g., clean and drain sinuses). {Grade C}

**Fluid Imbalance AEB:**

- **Dehydration:** acute weight loss; irritability; change in mood, cognitive, or functional status; fatigue; weakness; decreased urine output; decreased BP; decreased skin turgor (e.g., on forehead or sternum); concentrated urine; increased urine specific gravity; increased HR; weak, thready pulse; postural hypotension; dizziness; dry mouth/lips or furrowed tongue; thirst; constipation or fecal impaction; shallow respirations; flushed face; warm skin {Grade C}

- **Fluid volume deficit:** acute weight loss; decreased skin and tongue turgor, urinary output, capillary refill; dry oral/skin mucous membranes; hypotension; weakness; increased body temperature and urine concentration {Grade C}

- **Hypovolemia/Volume depletion:** increased HR; delayed capillary refill; decreased BP, turgor, body temperature; sudden weight loss; dizziness; fatigue; anorexia; N/V; thirst; constipation; confusion; oliguria; orthostatic hypotension; dry furrowed tongue {Grade C}

30. Correlate trends and cumulative intake (e.g., IVs, oral intake, tube feeding) and output (e.g., drainage, excretions, vomiting, diarrhea, insensible loss) to age, VS, weight, status of mucous membranes, disease process, laboratory values [e.g., blood urea nitrogen (BUN), sodium, osmolality], treatment/procedure/surgery, cognitive status, mood, functional status, hydration status, medical history, current condition (e.g., cardiovascular, neurologic, renal, GI and respiratory status), medications and baseline assessment data. {Grade C}

31. Assess for underlying causes and conditions of fluid imbalance: inadequate or excessive intake, excessive loss, impairment of the body's ability to balance/manage fluids and electrolytes (e.g., cardiac, renal, neurologic respiratory failure) and environment. {Grade C}

32. Review existing orders (e.g., IV rates/solution, diet/fluid restrictions) determine fluid requirements and evaluate what is being provided via oral, enteral and/or IV methods. {Grade C}

33. Anticipate route of fluid administration adjustments: routes (e.g., oral, IV, nasogastric or gastrostomy tube) and types (e.g., oral replacement, dextrose, normal saline). {Grade C}

34. Evaluate medications (e.g., diuretics, steroids, ACE inhibitors, psychotropic agents, laxatives) and potential contribution to the fluid imbalance. {Grade C}

35. Evaluate response to interventions (e.g., VS, weight, intake/output, laboratory values) and adjust as needed. {Grade C}

36. Anticipate need for physiologic monitoring (e.g., cardiorespiratory, pulse oximetry, invasive monitoring, continuous urinary output). {Grade C}

37. Evaluate the need for respiratory support (e.g., O₂ therapy, airway management, mechanical ventilation) and hemodynamic support (e.g., fluid bolus, inotropic agents). {Grade C}

38. Maintain skin and mucous membrane integrity (e.g., moisturizer, positioning, adequate cooling). {Grade C}

**Undernutrition AEB:**

- early satiety; anorexia; unintentional weight loss; decreased muscle mass/strength and subcutaneous fat; thin appearance; weakness; apathy; decreased activity; frequent infections; skin breakdown; inability to heal; fluid, vitamin/mineral depletion; electrolyte imbalance; anemia

39. Correlate current nutritional status to current/past medical, diet, social and psychological history, current weight (including changes), body mass index (BMI), height, laboratory values, micronutrient deficiencies, presence of nonhealing ulcers/wounds and overall skin condition, functional status, medications and baseline assessment data. {Grade C}

40. Assess and determine nutritional requirements (e.g., calories, protein, fluid, micronutrients). {Grade C}

41. Determine potential causes (e.g., work of breathing, GI, oral, psychological, psychosocial and/or physical limitations) and provide appropriate therapeutic interventions and resources. {Grade C}
42. Provide and/or encourage oral care (e.g., oral hygiene, prevention of dry mouth). (86) {Grade A}

43. Encourage and provide adequate food and fluid intake by providing a variety of foods/fluids that are visually appealing, savory and nutrient-dense; offering food preferences, allowing foods to be bought in by family, using oral supplements/calorie and protein enhancers and minimizing diet restrictions. (62; 86) {Grade A}

44. Meet calorie, protein, micronutrient and fluid requirements utilizing oral, vitamin/mineral supplementation, enteral (e.g., gastric, small bowel feeding) and/or parenteral methods. A combination of therapies may also be used. (62; 86) {Grade A}

45. Monitor for intolerances [e.g., abdominal distension, increased gastric residuals, N/V, diarrhea/constipation] and collaborate for resolution strategies. (55; 62) {Grade C}

46. Evaluate and maintain nutrition support (e.g., enteral, parenteral) access site for displacement/dysfunction/infection/skin breakdown. (55; 62) {Grade C}

47. Monitor for electrolyte abnormalities (e.g., phosphorus, potassium and magnesium) and signs/symptoms of heart/respiratory failure (particularly in undernourished patients or those with prolonged NPO status). (46; 62) {Grade C}

Acute Pain AEB: (13)

Patient may have nociceptive, neuropathic or a combination of both types of pain:

- **Nociceptive (somatic):** recent onset; well-localized; sharp, pin-prick, aching, stabbing or throbbing
- **Nociceptive (visceral):** poorly localized; diffuse with vague complaints such as generalized ache or pressure; may be referred to sites remote from the primary injury. Autonomic symptoms include N/V, hypotension, bradycardia, sweating.
- **Neuropathic:** radiating or specific burning, electric-like, shooting, tingling or lancinating (stabbing, piercing) pain. Physical exam may reveal allodynia (pain on light touch), hypoalgesia or hyperalgesia (relatively decreased or increased perception of noxious stimulus) or hyperpathia (exaggerated pain response). Symptoms usually are experienced distal to the site of injury.
- **Geriatrics - additional considerations:** changes in mental status; changes in appetite; agitation; rigidity-resistance to certain movements during care; withdrawn affects; paucity of conversation; depression; allodynia; decreased activity levels; loss of function; lack of adaptation skills (5)
- **Nonverbal patient** (e.g., advanced dementia, mechanically ventilated and/or sedated, unconscious): sympathetic stimulation (e.g., facial expression (relaxed versus brow lowering, eyelid closing, grimacing), upper limb movements (e.g., no movement versus partially bent, fully bent with finger flexion, permanently retracted), mechanical ventilation compliance (e.g., tolerating movement versus coughing but tolerating most of time, fighting ventilator, unable to control ventilation) (1; 35; 66; 69; 76)

48. Evaluate pain using identified tool/self-report description [e.g., onset, location, radiation frequency/duration, intensity/severity at rest and with activity, aggravating/relieving factors (medications, positioning, treatment devices), exacerbation]; physiologic and behavioral indicators [e.g., moaning, rubbing a particular area, guarding, facial expression (brow lowering, orbital tightening, levator contraction, eyelid closing), decreased attention span, agitation, inability to rest/sleep, inability to alleviate distress], patient's stated perception of pain tolerance and correlate to VS, type of procedure/treatment/disease process, expected pain progression, cultural factors that may influence pain perception and baseline assessment data. (6; 12; 32; 38) {Grade B}

49. For patients unable to communicate (e.g., advanced dementia, mechanically ventilated and/or sedated, unconscious), evaluate pain using report of pain/behavior changes from family/caregiver, use of pain behavior checklist: sympathetic stimulation (e.g., facial expression (relaxed versus brow lowering, eyelid closing, grimacing), upper limb movements (e.g., no movement versus partially bent, fully bent with finger flexion, permanently retracted), mechanical ventilation compliance (e.g., tolerating movement versus coughing but tolerating most of time, fighting ventilator, unable to control ventilation) and anticipate analgesic trial. If behaviors do not improve with analgesia, anticipate addition of sedatives and/or antipsychotic medications. (1; 35; 66; 69; 76) {Grade C}

50. For patients unable to respond behaviorally to pain (e.g., pharmacologically paralyzed, flaccid) assume pain is present if patient has chronic painful condition(s), painful activity (e.g., physical therapy), or potentially painful procedures (e.g., suctioning, turning, dressing changes) and begin to treat appropriately with analgesia trial. (1; 35; 66; 69; 76) {Grade C}

51. Establish with patient what level of discomfort is acceptable that will allow for maximal function with basic/instrumental activities of daily living (BADL/IADL). (13; 38) {Grade B}

52. Mutually develop plan for pharmacologic/nonpharmacologic comfort measures as appropriate [e.g., medications (appropriate to type of pain reported), procedures (neuraxial or sympathetic blocks), adjuvants such as complement and alternative therapies (massage, touch, hypnosis, acupuncture), physical medicine/rehabilitation techniques (assistive devices, orthotics, transcutaneous electrical nerve stimulation, ultrasound, massage, therapeutic exercise), psychological interventions (behavioral therapy, biofeedback, cognitive behavioral therapy, counseling, relaxation)]. (13; 38) {Grade B}

53. Account for the possibility of acute pain in the presence of pre-existing chronic pain syndrome and adjust medications appropriately (e.g., use patient's prehospital basal rate plus adjustment for acute pain). Collaborate with patient on what has worked best for him/her in the past. (13; 22) {Grade B}

54. Initiate pain management plan that includes scheduled around-the-clock pain medication dosing with PRN breakthrough medications as prescribed if pain is present the majority of a 24-hour time span. (6; 13; 38) {Grade B}

55. Provide individualized pain management measures prior to procedure(s)/planned activities (e.g., turning, suctioning, wound care/drain removal). (38; 76) {Grade B}

56. Coordinate planned activities with pain management plan. (38) {Grade C}
57. Anticipate need for management of drug-induced side effects. For opioids: N/V, vasodilation leading to hypotension, constipation, itching, myoclonus and respiratory depression. For nonsteroidal anti-inflammatory drugs (NSAIDs): dyspepsia, prolonged bleeding times, renal dysfunction, urinary retention, hypertension. (6; 7; 9; 13; 38) {Grade B}

Situational Response AEB:
- expression of anxiety, fear, denial, guilt, frustration, vulnerability, disappointment, anger, shock, blame, sadness, depression, hopelessness, apprehension, uncertainty, ambiguity, grief/loss (e.g., loss of control, loss of previous family/social role, loss of independence); increased stress (e.g., financial, relationships, roles, responsibilities) (14; 47; 49; 73; 80)

58. Develop trust relationship/rapport through therapeutic presence, active/empathic listening and sensitivity to nonverbal communication. (14; 26; 47; 49; 73) {Grade C}

59. Correlate patient/support system response to medical illness/injury with ability and/or readiness to comprehend information, past experiences/history (including mental health), current situation, developmental stage, medications/substance use and baseline assessment data. (14; 26; 73; 80) {Grade C}

60. Encourage verbalization of feelings regarding current situation. (14; 26; 47; 73; 80) {Grade C}

61. Support coping by recognizing current strategies and developing new strategies (e.g., journaling, relaxation techniques, guided imagery, problem solving, prayer). (14; 26; 47; 73; 80) {Grade C}

62. Evaluate the need for anticipatory guidance (e.g., provide information on realistic expectations, education/resources) and encourage patient/support system to ask questions regarding treatment/procedures. (14; 47; 49) {Grade C}

63. Facilitate the presence of/private time with the patient support system (e.g., partner, family members, children, friend, spiritual advisor). (14; 26; 49; 73) {Grade C}

64. Address concerns, offer reassurances and provide support for patient/support system. (14; 26) {Grade C}

Clinical Practice Guidelines represent a consistent/standardized approach to the care of patients with specific diagnoses. Care should always be individualized by adding patient specific information to the Plan of Care.
A. CLINICAL DESCRIPTION: Pneumonia descriptors (by location, by presentation or by causative agent). Pneumonitis: an inflammatory condition of interstitial lung tissue.

1. Classifications (typical):
   a. Community-acquired pneumonia: acute infection of the lower respiratory tract occurring in an individual outside of the hospital environment. Most common causes include: Streptococcus pneumoniae, Haemophilus influenzae and Mycoplasma pneumoniae.
   b. Atypical pneumonia: causative agent is either mycoplasma, chlamydia, Coxiella or legionella. These pneumonias are common, "atypical" refers to fact that causative agent is not bacterial.
   c. Aspiration: caused by inhalation of a foreign material.
   - Risk factors include: altered mental status, decreased or absent gag reflex, dysphagia, alcohol abuse, intubation/tracheostomy, seizures, periodontal disease, esophageal disorders, gastroesophageal reflux disease (GERD), neurologic disorder.
   d. Healthcare-associated infection: (64)
      - Hospital-acquired pneumonia: occurs 48 hours or more after admission, which was not incubating at the time of admission.
      - Ventilator-associated pneumonia: arises more than 48 to 72 hours after endotracheal intubation.
      - Healthcare-associated pneumonia: includes any patient who was hospitalized in an acute care hospital for two or more days within 90 days of the infection, resided in a nursing home or long-term care facility, received recent IV antibiotic therapy, chemotherapy or wound care within the past 30 days of the current infection or attended a hospital or hemodialysis clinic.

B. PATHOPHYSIOLOGY/ETIOLOGY/RISK FACTORS FOR POTENTIAL PROBLEMS:

Begins with infection/inflammation in alveolar spaces. Fluid and blood cells escape into alveoli. The alveolar spaces fill with fluid, WBC and cellular debris. Inflammation causes lungs to stiffen, decrease lung compliance, increase work of breathing. Unoxygenated blood is shunted through lungs to left atrium causing a ventilation/perfusion (VQ) mismatch leading to a decrease in SpO2/partial pressure of O2. Pneumonia is the seventh leading cause of death overall in the U.S., and is the leading cause of death due to infectious disease.

- Risk factors: age less than one year and greater than 65 years, history of upper respiratory infection (URI), flu or viral syndrome, COPD, asthma, tuberculosis (TB), prolonged immobilization, sickle cell anemia, neurologic disorders causing difficulty swallowing and/or paralysis of diaphragm, thoracic and/or abdominal surgery, alcoholism, smoking, malnutrition, immunocompromised states, occupational hazards (e.g., mining, farming).

1. Hypoxia/Hypoxemia: (11; 31) Hypoxia occurs when oxygenation of the body is inadequate to meet the metabolic demands of the tissues. Hypoxia is a life-threatening condition. Hypoxemia is a failure of the respiratory system to oxygenate arterial blood. (11)
   - Hypoxia: may have several different causes, including tissue perfusion alteration (e.g., decreased cardiac output, vascular occlusion), decreased O2 tension in the blood (e.g., high altitude), decreased O2-carrying capacity (anemia, carbon monoxide poisoning, hemoglobinopathy), compromise of regional blood flow (e.g., vascular occlusion, stasis or hypertension), compromised perfusion from the capillaries to the tissues (edema) or impaired utilization of O2 at the cellular level (cyanide toxicity).
   - Hypoxemia: is caused by low inspired O2 (e.g., high altitude or gas blender failure), increased diffusion barriers (e.g., end-stage lung disease), hypoventilation (e.g., postoperative patients, pain, opioid overdose, neuromuscular disease), ventilation-perfusion mismatch (e.g., pulmonary emboli, pneumonia) and shunt or venous admixture (e.g., heart defects).

2. Infection leading to Sepsis: Infection occurs when microorganisms invade healthy tissue and proliferate to the point of overwhelming the host's immune response. Transmission of infection requires three elements: 1) a source of infectious agents; 2) a susceptible host with a portal of entry receptive to the agent and 3) a mode of transmission of the infectious agent. Host factors that increase susceptibility to healthcare-associated infection include: extreme age, underlying conditions (e.g., diabetes, malnutrition), immunodeficiency, malignancy and transplants. Whole body infection (sepsis) may result from the spread of local infections. Multidrug-Resistant Organisms (MDRO) have significant healthcare-associated infection potential. (24; 52; 72; 79; 81)
   - Organisms with significant healthcare-associated infection potential include:
     - Multidrug-Resistant Organisms (MDRO): are resistant to all but a few antimicrobial pharmaceutical agents although the names of some MDRO imply resistance to only one agent [e.g., MRSA and Vancomycin-Resistant Enterococcus (VRE)]. Other MDRO of concern include multidrug-resistant Streptococcus pneumoniae (MDRSP) and strains of Staphylococcus aureus that are intermediate or resistant to vancomycin. (81)
     - Staphylococcus aureus, coagulase-negative staphylococci, Enterococcus subspecies and Escherichia coli: are the most frequently isolated organisms from surgical site infections (SSI). (52)
   - Pathophysiology:
     - Microorganisms may contain/produce toxins that increase their ability to invade a host, damage the host or survive on or in host tissue. Infection occurs when microorganisms invade healthy tissue and proliferate to the point of overwhelming the host’s immune response. Infection is viewed as a continuum of injury, from local infection to bacteremia leading to sepsis, then severe sepsis-induced hypotension leading finally to multiple organ dysfunction syndrome. Euglycemic control is imperative for infection prevention. (52; 72)
   - Risk factors:
     - The state of one’s immune system at the time of exposure, interaction between pathogens and virulence factors of the infectious agent affect individual outcomes. (81)
     - Host factors that increase susceptibility to healthcare-associated infection include: extreme age, underlying conditions (e.g., diabetes, malnutrition), human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), malignancy and transplants. (81)
Surgical procedures and radiation therapy impair skin barrier defenses. Infections associated with invasive procedures are usually caused by the patient’s endogenous flora (from skin, mucous membranes or hollow viscera) but may result from transmission of exogenous (within the healthcare facility) infectious agents. (52; 81)

Evidence that strict glycemic control is necessary in nondiabetics is controversial. (8)

Medications that alter normal flora and increase susceptibility to infection include: antimicrobial agents, gastric acid suppressants, corticosteroids, antirejection drugs, antineoplastic agents and immunosuppressive drugs. (81)

Indwelling devices (e.g., urinary catheters, endotracheal tubes, central venous/arterial catheters and synthetic implants) facilitate healthcare-associated infection by allowing pathogens to bypass normal host defenses. (81)

New elements of Standard Precautions include: Respiratory Hygiene/Cough Etiquette, safe injection practices and use of masks during epidural/spinal injections and lumbar puncture. (81)

Most fungal sinus infections require surgery. (70)

3. Fluid Imbalance:
   a. Disorders of fluid can be classified depending on disturbances in volume, concentration or composition.
   b. Laboratory values: sodium, potassium, chloride, bicarbonate, BUN, creatinine, calcium, glucose, hemoglobin, hematocrit, serum osmolality, urinalysis, urine sodium, urine osmolality
   c. Definitions:
      - Dehydration: is a loss of pure water which results in volume depletion and hypernatremia. Treatment depends on the type of dehydration.
      - There are three types: (2)
         - Isotonic dehydration (water and sodium deficit): loss of both salt and water (e.g., diuretics, severe or prolonged diarrhea or vomiting)
         - Hypertonic dehydration (fluid deficit): loss of more water than salt (e.g., diuretic use, infections, fever, or diabetes insipidus). Treat with normal saline if patient is hemodynamically unstable and with ¼ normal saline if hemodynamically stable.
         - Hypotonic dehydration (sodium deficit): loss of more salt than water (e.g., diuretics, salt-wasting renal disease). Treat with normal saline whether the patient is hemodynamically stable or unstable.
      - Levels of Dehydration: (2)
         - Mild: Some deficits or abnormalities in laboratory values exist, but the patient’s circulation, organ function or level of functioning is not seriously impaired.
         - Moderate: Some deficits or laboratory abnormalities exist but impairment of circulation or organ function is not immediately life-threatening.
         - Severe: significant laboratory deficits or abnormalities and life-threatening risks or problems with circulation, organ function or activities of daily living
   d. Fluid volume deficit: A loss of body fluids (e.g., water, electrolytes, and bodily fluids), caused by deficient intake or excessive excretion (e.g., sweating, vomiting, diarrhea, fistulas, fever, hemorrhage, third space fluid shifts). (58; 85)
   e. Hypovolemia/Volume depletion: extracellular fluid deficit occurs when circulating blood volume decreases. Most common cause is acute hemorrhage. Usually accompanied by loss of sodium and water, leading to imbalances of osmolarity and acid-base. If inadequate tissue perfusion is untreated, organ dysfunction may occur. (78; 83)
   f. Overhydration: excess of pure water. Water is retained inappropriately due to syndrome of inappropriate antidiuretic hormone secretion (SIADH), excess free water ingested or infused to correct isotonic fluid loss. (74)
   g. Pathophysiology/Etiology:
      - Maintaining fluid balance is crucial to optimize metabolic function. During acute illness, altered hormone productions (e.g., antidiuretic hormone and aldosterone) current medical condition/status and procedures/surgeries/treatments/medications can affect fluid balance.
   h. Risk factors:
      - Clinical conditions: dementia, fever, diarrhea, vomiting, types of medications (e.g., diuretics, phenytoin, laxatives), draining wounds, excessive rapid breathing, hemorrhaging, swallowing/chewing difficulties, NPO status (including duration).
   i. Environmental factors: tube feeding, language barriers, isolation, restraints, dependence on others for care
   j. Other Considerations:
      - Fluid requirements: vary with age (decrease with age), sex, body weight, disease state and insensible losses. Total body water decreases with age. The young adult has 60 percent body water whereas the geriatric adult has 40 percent body water. Because of decreased body water, geriatric patients are more susceptible to fluid changes and electrolyte imbalances. They have a decreased ability to concentrate urine, conserve sodium and excrete potassium. (29)
      - Daily requirements: (44; 83)
        - Adults: 1mL/kcal or 35 mL/kg body weight
        - Young adults: 40 mL/kg body weight
        - Elderly adults (greater than 65 yrs): 30 mL/kg body weight
4. Undernutrition:  
   a. Undernutrition: a deficiency of calories, protein and micronutrients. Associated with poor clinical outcomes, immunosuppression, decreased ability to heal, poor functional status, frequent hospitalizations, increased length of stay and death.
   b. Pathophysiology/Etiology: Multiple conditions and diseases may contribute to undernutrition, including oral causes (e.g., poor dentition, sore or dry mouth, thrush, swallowing difficulties, disturbances of taste and smell), GI disorders (e.g., N/V, abdominal pain, food aversion, diarrhea, constipation, bowel obstruction, delayed gastric emptying, malabsorption), psychological factors (e.g., depression, social isolation, grieving) and physical immobility (e.g., lack of ability to obtain and/or prepare food, inability to feed self). If unable to take foods/liquids through oral intake, enteral is the preferred route (providing there is a functional/accessible GI tract, ability to tolerate the tube feeding and no contraindications). If unable to provide enteral nutrition, parenteral nutrition should be considered.
   c. Risk factors: Many risk factors can contribute to this condition including current/past medical condition and or disease state, hospitalization, psychological and psychosocial factors. Factors in pneumonia include increased work of breathing, dysphagia and intubation.

5. Acute Pain:  
   a. Etiology/Pathophysiology:  
      • Acute pain: a symptom versus a diagnosis. Pain is subjective. Acute pain is usually related to an injury, trauma or surgery, thus is protective, acting as an early warning sign that tissue damage is about to occur or is occurring. The patient expects to recover after the injury or surgical wound heals. (13; 22; 32)
      • Chronic or persistent pain: pain that lasts beyond the healing process and has outlived its warning role. It becomes persistent and debilitating, lasting for more than six months. It can exist when there is no evidence of tissue damage (e.g., phantom pain). It may be intermittent or continuous, poorly differentiated and may or may not be associated with an injury or chronic disease. Diagnostic tests may not necessarily reveal a specific source of the pain. Patient may show few or no outward signs of pain as they have learned to tolerate the pain for so long. (12; 22; 32)
      • Acute-on-chronic pain: person suffering from chronic pain (e.g., cancer or neuropathy) who is admitted to an acute care setting for surgery or injury. Both types of pain must be treated. (12)
   b. Types of Pain (can occur independently or combined):  
      • Nociceptive (somatic): results from injury of the skin/mucosa, muscle, bone, tendons, ligaments and joints, arteries (e.g., superficial lacerations/burns, intramuscular injections, IV access, otitis media, stomatitis, extensive abrasions). Responds best to acetaminophen, cold packs, corticosteroids, localized anesthetic (e.g., topical or infiltrate), NSAIDs, opioids and tactile stimulation. (12; 13; 32)
      • Nociceptive (visceral): results from stimulation of nociceptors in internal organs (e.g., stomach, kidney, bladder, gallbladder, pancreas, intestines). Ischemia/necrosis, inflammation, ligamentous stretching, smooth muscle spasm, and distension of a hollow organ capsule all contribute to visceral pain (e.g., colic, sickle cell, appendicitis, kidney stone, postoperative abdominal surgery). Responds best to corticosteroids, intraspinal local anesthetic agents, NSAIDs (IV route Ketorolac for NPO patients) and opioids (via any route). (12; 13; 32)
      • Neuropathic: caused by damage to a nerve, either centrally or peripherally. Pressure on tissues surrounding the neural tissues and abnormal processing of impulses also causes neuropathic pain [e.g., trigeminal, avulsion neuralgia, post-traumatic neuralgia, peripheral neuropathy (diabetes, HIV), limb amputation, herpetic neuralgia]. This type of pain provides no protective benefit and precipitates ongoing suffering. Responds best to anticonvulsants (e.g., gabapentin), corticosteroids, neural blockade, NSAIDs, opioids (via any route) and tricyclic antidepressants. (12; 13; 22)
c. **Geriatric Self-report Pain Scales:**

- **Normal cognitive function:** Older patients do not necessarily use the word “pain.” Instead, ask which term they relate best to [e.g., ache, hurt, discomfort; or just ask the intensity of their pain (none, some, severe)]. Ask which type of scale works best for them [e.g., visual analogue, verbal numeric rating, faces pain scale-revised (FPS-R; no smiles or tears), verbal descriptor or revised verbal descriptor – includes visual pain thermometer]. Note that decreased hearing/vision may hamper verbal/visual communication as well as visual tools. (33; 42; 60)
- **Mild dementia:** If mild dementia is suspected, patient should first receive a cognitive evaluation that includes the Mini Mental State Examination (MMSE). Appropriate scales include verbal descriptor scale, pain thermometer or FPS-R (patient may have difficulty differentiating between pain or mood). (33)
- **Advanced dementia:** Assessment traditionally has moved from self-report to clinician observed scale. The “Pain Assessment in Advanced Dementia” (PAINAD) scale measures the following: breathing independent of vocalization, negative vocalization, facial expression, body language and consolability. It is rated on a 0 to 2 scale, with a total score range of 10. (30) Use of the Verbal Rating Scale (VRS) and Faces Pain Scale (FPS) have been used with some success in patients with severe dementia. (68)
- **Pharmacology:** renal and liver function studies, as well as serum protein levels should be measured in geriatric patients prior to starting certain medications, especially NSAIDs. (33; 75)
- **Nonverbal** (e.g. advanced dementia, mechanically ventilated and/or sedated, unconscious). (1; 35; 66; 69; 76) More than one measure may be needed to adequately detect the pain and evaluate outcome of interventions. Recommended hierarchy of assessment steps include:
  - Self-report: May be hampered by level of consciousness, artificial airway, medication(s), delirium.
  - Search for potential causes of pain/discomfort (e.g. existing medical condition, surgical/medical procedures, traumatic injuries, blood draws, and routine care).
  - Observe patient behaviors. **Note:** behavioral scales are not appropriate for pharmacologically paralyzed patients, or those who are flaccid and cannot respond behaviorally to pain. In this case, assume pain is present and treat appropriately with analgesics prior to procedures thought to be painful (including turning).
  - Surrogate (family members, caregivers) report of pain and behavior/activity changes
  - Attempt analgesic trial. If behaviors do not improve with analgesia, consider addition of sedatives and/or antipsychotics.

**Sample pain tools for assessment in nonverbal patients include:** Assessment of Discomfort in Dementia Protocol, Checklist of Nonverbal Pain Indicators by Feldt, PAINAD, Behavioral Pain Scale by Payen (BPS). (35)

6. **Situational Response:**

a. Although distress related to the experience of the illness/injury abates over time, the psychological impact of the distress lingers. (47)

b. “What happens when my body breaks down happens not just to that body but also to my life, which is lived in that body. When the body breaks down, so does the life. Even when medicine can fix the body, that doesn’t always put the life back together again.”—Arthur Frank (47)

c. Psychological defenses allow us to cope with our day-to-day life. Increased stress leads to less effective psychological defenses, therefore, our typically well-managed emotions (e.g., anger, sadness, anxiety, frustration) become less well-managed leading to emotional instability, interpersonal conflict and diminished social/occupational functioning in many persons. (20)

d. The family unit is a system based on interdependency between members and patterns that provides structure and support. Illness and/or injury in one family member may disrupt these relationships and patterns. (14)

e. Individual differences need to be considered regarding response/reaction to medical event/illness/injury and support provided to patient/support system. Gender and/or cultural differences may influence response/reaction as well as attitudes and beliefs about support. (49)

f. Healthcare practitioners may hesitate to ask questions related to a patient/support system emotional/mental status, for fear of not feeling prepared to deal with the response. Failure to address this area of patient/support system health can result in suboptimal care. For this reason, it is essential to refer to someone on the healthcare team that is knowledgeable, competent and comfortable in assisting the patient/support system in this area. (14; 80)

g. **Definition:** A phase in one’s life during which normal ways of dealing with the world are suddenly interrupted due to a medical event/illness/injury. (26)

h. **Risk factors:** Adjustments/reactions to a medical event/illness/injury, under any circumstances, are necessary and normal. A history of chronic mental health issues, substance use/abuse, poor coping abilities/strategies, past experience of trauma/abuse (both personal and professional), lack of support and low self-esteem contribute to an inability to deal with a medical event/illness/injury successfully. (41)

C. **ADDITIONAL INFORMATION:**

1. **Causative agent:**
   - **Bacterial:** most common; may be caused by many different organisms; treated with antibiotics.
   - **Viral:** also common; supportive treatment, antibiotics only used for suprainfection.
   - **Fungal:** most commonly seen in immunocompromised states; treated with antifungal drugs.
2. **Symptomatology by type of pneumonia:**
   a. **Bacterial:**
      - **Klebsiella:** pleuritic chest pain, fever, recurrent chills, excessive and purulent sputum (green or bloody, viscous, jellylike), hypoxemia, vomiting, diarrhea, jaundice, shallow breathing or difficulty breathing (dyspnea), cyanosis of the lips and nail beds.
      - **Staphylococcus:** pleuritic chest pain, shortness of breath, rapid respirations, high fever, recurrent shaking chills, bloody sputum, hypoxemia.
      - **Streptococcus pneumonia:** pleuritic chest pain, dyspnea, bloody or rust-colored sputum, sustained fever, shaking chills, distended abdomen or abdominal pain.
      - **Other streptococcus:** rapid onset of symptoms following upper respiratory tract infection, sustained high fever, shaking chills, severe cough.
      - **Mycoplasma:** cough and sore throat, headache, malaise, anorexia, N/V, diarrhea, joint pain, fever, chills, persistent hacking, nonproductive cough.
      - **Haemophilus influenza:** pleuritic chest pain, productive cough, chills, fever often present with severe sore throat and drooling due to painful swallowing related to acute epiglottitis.
   b. **Viral:**
      - **Rubeola:** cough with limited sputum production, swollen glands, generalized skin rash, dyspnea, fever.
      - **Respiratory syncytial virus (RSV):** cough with small sputum production, swollen glands, runny nose, sore throat, fever, malaise, anorexia. The clinical course is significantly different from other pneumonias. **Note:** This CPG would not be appropriate to use for RSV infection.
      - **Influenza:** initial nonproductive cough followed by purulent sputum, headache, muscle ache, leg pain, chest ache, fever, chills, severe dyspnea, cyanosis, sore throat, rhinorrhea.
      - **Cytomegalovirus:** cough, dyspnea, cyanosis, weakness, diffuse crackles in lungs, fever, shaking chills.
      - **Adenovirus:** cough, chest pain, sore throat, malaise, small amounts of mucoid sputum, fever, chills, chest pain, anorexia, crackles/rhonchi, rhinitis, adenopathy, hoarseness.
      - **Varicella:** cough, dyspnea, cyanosis, rash, pleuritic chest pain, rapid breathing, rhonchi, hemoptysis.
   c. **Fungal:**
      - **Aspergillus** (bronchopulmonary aspergillosis): wheezing with fever, brown sputum plugs expectorated and positive skin test to Aspergillus Antigen.
      - **Candidiasis:** rarely develops alone, usually associated with disseminated candidiasis. SOB, cough, respiratory distress; fever, complaints of dyspnea, variable breath sounds (clear to scattered cracks/wheezees). (36)
      - **Coccidioidomycosis:** 60 percent of those infected are asymptomatic or have only mild upper respiratory symptoms. Other 40 percent have cough, fever, pleuritic pain, weakness, myalgia and arthralgia.
      - **Pneumocystis jiraveci (formerly carinii):** fever, fatigue, weight loss, dry cough, SOB.
   d. **Noninfectious:**
      - Neoplasms
      - Pulmonary embolism
      - Pulmonary hemorrhage
      - Sarcoidosis
      - Pulmonary edema
      - Acute respiratory distress syndrome
      - Eosinophilic pneumonia
      - Bronchiolitis obliterans with organizing pneumonia
      - Pulmonary vasculitis
      - Drug-induced pulmonary infiltrates
3. **Significant laboratory values/diagnostic studies:**
   a. **Chest x-ray:** used to diagnose pneumonia and document resolution of infection.
   b. **Sputum culture:** to determine specific causative agent. Initiation of antibiotic therapy should not be delayed if sputum specimen unobtainable. Sputum sampling easier to obtain in early morning. Have patient perform oral hygiene prior to obtaining sample. Tips for induction: position in upright sitting position, reposition side to side to loosen secretions, use huff-cough procedure, drinking may trigger cough reflex, mist treatments or aerosol.
   c. **Quantitative rapid pneumolysin PCR assay.**
   d. **Blood cultures** (2 sets), optimally acquired prior to initiation of antimicrobial therapy.
   e. **Blood cell counts:** increased WBC secondary to inflammatory response to bacterial invasion.
   f. **Serum glucose and electrolyte measurements.**
   g. **CRP:** increased with bacterial versus viral pneumonia.
   h. **Increased sedimentation rate** (sed rate) related to infection, dehydration, hypovolemia.
   i. **ABG change:** respiratory acidosis (most common), increased PCO₂, decreased pH, decreased SpO₂/partial pressure of O₂ or pulse oximetry.
   j. **Bronchial alveolar lavage:** procedure used to obtain sputum samples from lower respiratory tract performed during bronchoscopy or via endotracheal tube.
4. **Prevention:**
   a. Pneumovax/influenza vaccine recommended for high risk population (e.g., elderly, persons with chronic respiratory disease). Do not give in presence of acute fever. The vaccines may be given at the same time in different arms. (51)
   b. Avoid crowds, especially during fall and winter; avoid known irritants.
   c. Must take full course of antibiotics to prevent recurrence and development of drug-resistant bacterial infections.
   d. Compliance with appropriate positioning during meals, diet and swallowing methods, diet texture and liquid consistency recommendations.

5. **Care Considerations:**
   a. O₂ is given to correct hypoxemia. Humidification can be added to enhance mobilization of secretions.
   b. Pneumonia Severity Index is utilized to help determine the risk of mortality and morbidity and therefore the need for hospitalization for individuals with community-acquired pneumonia. Pneumonia severity index calculator is available at [http://pda.ahrq.gov/clinic/psl/psicalc.asp](http://pda.ahrq.gov/clinic/psl/psicalc.asp).
   c. Fluid management corrects hypovolemia and improves ventilation/perfusion ratio and thin secretions.
   d. Sedatives may depress respiration and cough reflex, which may further hypoxemia.
   e. Frequent turning may prevent pooling of secretions in the lungs. In extreme cases, rotational therapy may be used.
   f. Pleural friction rub is best heard in late inspiration and early expiration and is intermittently audible. Pericardial friction rub is best heard in 2nd, 3rd and 4th intercostal spaces, left of sternum or at apex, with patient leaning forward.
   g. Fatigue, weakness and residual cough may last for weeks, especially in elderly.
   h. Antipyretic measures are indicated when hemodynamic or neurologic status is compromised secondary to fever.

6. **Tobacco Cessation:** All healthcare providers should provide tobacco cessation information to every tobacco user at each encounter.

**D. PATIENT/FAMILY RESOURCES:**


**E. SAFETY CONSIDERATIONS AND INITIATIVES:**

1. **Pneumonia:**
   The Joint Commission, in collaboration with the Centers for Medicare and Medicaid Services, the Infectious Disease Society of America, the American Thoracic Society, the American Society of Emergency Room Physicians and the Centers for Disease Control and Prevention:
   - Accreditation Canada:

2. **Influenza Prevention:**
   National Quality Forum:
   - Accreditation Canada.

3. **Infection:**
   Reduce the risk of healthcare-associated infections:
   - The Joint Commission:
     - 2012 Hospital Accreditation Standards:
       - National Patient Safety Goal: NPSG 7: Reduce the risk of healthcare-associated infections.
     - The Joint Commission International:
   - National Quality Forum:
     - Safe Practices for Better Healthcare – 2010 Update (3/2011), Safe Practice 24, Multidrug-Resistant Organism Prevention: Implement a systematic multidrug-resistant organism (MDRO) eradication program built upon the fundamental elements of infection control, an evidence-based approach, assurance of the hospital staff and independent practitioner readiness, and a re-engineered identification and care process for those patients with or at risk for MDRO infections.
   **Note:** This practice applies to, but is not limited to, epidemiologically important organisms such as methicillin-resistant Staphylococcus aureus, vancomycin-resistant enterococci and Clostridium difficile. Multidrug-resistant gram-negative bacilli, such as Enterobacter species, Klebsiella species, Pseudomonas species, and Escherichia coli, and vancomycin-resistant Staphylococcus aureus, should be evaluated for inclusion on a local system level based on organizational risk assessments.
Accreditation Canada:

Safer Healthcare Now!

Catheter-Associated Urinary Tract Infection Prevention:
National Quality Forum:

Institute for Healthcare Improvement:

Centers for Medicare & Medicaid Services:

Department of Health and Human Services & Centers for Disease Control and Prevention:

Central Line-Associated Infection:
The Joint Commission:
- 2012 Hospital Accreditation Standards:
  - National Patient Safety Goal: NPSG.07.04.01: Implement evidence-based practices to prevent central line-associated bloodstream infections.

Centers for Medicare & Medicaid Services:

Safer Healthcare Now!

AACN:

Glycemic Control:
National Quality Forum:

Centers for Medicare & Medicaid Services:

4. Nutrition Assessment:
The Joint Commission:
- 2012 Hospital Accreditation Standards:
  - Provision of Care: Standard PC.01.02.01: The hospital assesses and reassesses its patients.
  - Standard PC.01.02.03: The hospital assesses and reassesses the patient and his or her condition according to defined time frames.
  - Standard PC.02.03.02: The hospital makes food and nutrition products available to its patients.
  - Standard PC.02.03.01: The hospital provides patient education and training based on each patient’s needs and abilities.

The Joint Commission International:
  - Assessment of Patients: Standard AOP.1.6: Patients are screened for nutritional status and functional needs and are referred for further assessment and treatment when necessary.

5. Hygiene (Oral):
The Joint Commission:
- 2012 Hospital Accreditation Standards:
  - Provision of Care: Standard PC.02.03.03: The patient’s personal hygiene is maintained.
6. **Pain:**
   The Joint Commission:  
   2012 Hospital Accreditation Standards:
   - Provision of Care:  
     - **Standard PC.01.02.07:** The hospital assesses and manages the patient’s pain.
     - **Standard PC.02.03.01:** The hospital provides patient education and training based on each patient’s needs and abilities.
   - Rights and Responsibilities of the Individual: **Standard RI.01.01.01:** The hospital respects, protects and promotes patient rights
   The Joint Commission International:  
   - Patient and Family Rights: **Standard PFR.2.4:** The organization supports the patient’s right to appropriate assessment and management of pain.
   - Assessment of Patients: **Standard AOP.1.7:** All inpatients and outpatients are screened for pain and assessed when pain is present.
   - Care of Patients: **Standard COP.6:** Patients are supported in managing pain effectively.
   - Patient and Family Education: **Standard PFE.4:** Patient and family education includes the following topics, related to the patient’s care: the safe use of medications, the safe use of medical equipment, potential interactions between medications and food, nutritional guidance, pain management and rehabilitation techniques.

F. Refer to the Dysphagia Guideline for patients with known or diagnosed Dysphagia, Mechanical Ventilation for treatment of Ventilator Associated Pneumonia, Infection, Systemic Inflammatory Response Syndrome (SIRS)/Sepsis (Adult), Anxiety, Fear, Coping (Ineffective Individual) Clinical Practice Guidelines that may apply to the medical diagnosis, treatment, procedure.
References


Safety References:


The Joint Commission (2011). *2012 hospital accreditation standards: Provision of care, treatment, and services (PC.01.02.01, PC.01.02.03, PC.02.02.03, PC.02.03.03)*. Oakbrook, IL: The Joint Commission.

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