	Section 2: Core Rotations ****For rotations that recur several times over residency, concentrate on specific objectives for specific year of training** ***For rotations that recur several times in a given academic year, review goals and objectives before each rotation to insure all objectives met over the course of the year.**		

	Inpatient Rotation (Including Night Float) ***Level of Training Noted at Right** ***Night Float should use the objectives for PL2s and PL3s, as well as goal 2.8**		

Competency	Goals and Objectives	Level of Training	Completed
	2.1 GOAL: Common Signs and Symptoms (Inpatient). Evaluate and manage common signs and symptoms associated with acute illness and hospitalization.		
PC, MK	2.1.1 Evaluate and manage, with consultation of indicated, patients with signs and symptoms that commonly present to the Inpatient Unit (examples below). General: acute life-threatening event (ALTE), constitutional symptoms, hypothermia, excessive crying, failure to thrive, fatigue, fever without localizing signs, hypothermia, weight loss Cardiorespiratory: apnea, chest pain, cough, cyanosis, dyspnea, heart murmur, hemoptysis, hypertension, hypotension, inadequate respiratory effort, rhythm disturbance, shock, shortness of breath, stridor, syncope, tachypnea, respiratory failure, wheezing Dermatologic: ecchymoses, edema, petechiae, purpura, rashes, urticaria EENT: acute visual changes, conjunctival injection, edema, epistaxis, hoarseness, nasal discharge, stridor, trauma	1,2	

Competency	Goals and Objectives	Level of Training	Completed
	Endocrine: heat/cold intolerance, polydipsia, polyuria GI/Nutrition/Fluids: abdominal masses or distention, abdominal pain, ascites, dehydration, diarrhea, dysphagia, hematemesis, inadequate intake, jaundice, melena, rectal bleeding, regurgitation, vomiting Genitourinary/Renal: change in urine color, dysuria, edema, hematuria, oliguria, scrotal mass or edema GYN: abnormal vaginal bleeding, pelvic pain, vaginal discharge Hematologic/Oncologic: abnormal bleeding, bruising, hepatosplenomegaly, lymphadenopathy, masses, pallor Musculoskeletal: arthritis/arthralgia, bone and soft tissue trauma, limb pain, limp Neurologic: ataxia, coma, delirium, diplopia, headache, hypotonia, head trauma, lethargy, seizure, vertigo, weakness Psychiatric/Psychosocial: acute psychosis, child abuse or neglect, conversion symptoms, depression, suicide attempt		
	2.2. GOAL: Common Conditions (Inpatient). Recognize and manage common childhood conditions presenting to the Inpatient Unit.		
PC, MK	2.2.1 Evaluate and manage, with consultation as indicated, patients with conditions that commonly present to the Inpatient Unit (examples below). General: failure to thrive, fever of unknown origin Allergy/Immunology: acute drug allergies/reactions, anaphylaxis, immunodeficiencies, including graft vs. host disease, recurrent pneumonia, serum sickness, severe angioedema Cardiovascular: bacterial endocarditis, cardiomyopathy, congenital heart disease, congestive heart failure, Kawasaki disease, myocarditis, rheumatic fever Endocrine: diabetes (including diabetic ketoacidosis), electrolyte disturbances secondary to underlying endocrine disease GI/Nutrition: appendicitis, bleeding, cholangitis, complications of inflammatory bowel disease, complications of liver transplantation,	1,2	

Competency	Goals and Objectives	Level of Training	Completed
	cystic fibrosis, gastroenteritis (with/without dehydration), gastroesophageal reflux, hepatic dysfunction (including alpha-1-antitrypson disease), bowel obstruction, pancreatitis, severe malnutrition GU/Renal: electrolyte and acid-base disturbances, glomerulonephritis, hemolytic-uremic syndrome, nephrotic syndrome, urinary tract infection/pyelonephritis Gynecologic: genital trauma, pelvic inflammatory disease, sexual assault Hematologic/Oncologic: abdominal and mediastinal mass, common malignancies, fever and neutropenia, thrombocytopenia, severe anemia, tumor lysis syndrome, vaso-occlusive crises and other complications of sickle cell disease Infectious Disease: cellulitis (including periorbital and orbital) and skin abscess, cervical adenitis, dental abscess with complications, encephalitis, HIV, infections in immunocompromised hosts, laryngotracheobronchitis, late presentation of congenital infections (CMV, syphilis, tuberculosis, abscesses), line infection, meningitis (bacterial or viral), osteomyelitis, pneumonia (viral or bacterial), sepsis/bacteremia (including newborns), septic arthritis, tuberculosis Pharmacology/Toxicology: common drug poisoning or overdose, dose adjustment for special conditions or serum drug levels Neurology: acute neurologic conditions (acute cerebellar ataxia, Guillain Barre syndrome, movement disorders), developmental delay with acute medical conditions, seizures, shunt infections Respiratory: airway obstruction, asthma exacerbation, bacterial tracheitis, bronchiolitis, croup, cystic fibrosis, epiglottitis Rheumatologic: Henoch Schonlein purpura (HSP), juvenile rheumatoid arthritis (JRA), systemic lupus erythematosus (SLE) Surgery: pre- and post-op consultation and evaluation of surgical patients (general, ENT, orthopedics, urology, neurosurgical, etc.), special needs of technology-dependent children (blocked trachea, gastric tube dysfunction)		
	2.3. GOAL: Diagnostic and Screening Procedures (Inpatient). Utilize common diagnostic tests and imaging studies appropriately in		

Competency	Goals and Objectives	Level of Training	Completed
	the inpatient setting.		
PC	2.3.1 Demonstrate an understanding of the common diagnostic tests and imaging studies used in the inpatient setting, by being able to:		
MK	2.3.1.1 Explain the indications for and limitations of each study.	1	
PC	2.3.1.2 Know or be able to locate age-appropriate normal ranges (lab studies).	1	
MK, PBLI	2.3.1.3 Apply knowledge of diagnostic test properties, including the use of sensitivity, specificity, positive predictive value, negative predictive value, false-positive and negative results, likelihood ratios, and receiver operating characteristic curves, to assess the utility of tests in various clinical settings.	2	
SBP	2.3.1.4 Recognize cost and utilization issues.	3	
PC	2.3.1.5 Interpret test results in the context of the specific patient.	2	
PC	2.3.1.6 Discuss therapeutic options for correction of abnormalities.	2	
PC	2.3.2 Use common laboratory studies when indicated for patients in the inpatient setting. CBC with differential, platelet count, RBC indices Blood chemistries: electrolytes, glucose, calcium, magnesium, phosphate Renal function tests Tests of hepatic function (PT, albumin) and damage (liver enzymes, bilirubin) Serologic tests for infection (e.g., hepatitis, HIV) C-reactive protein, erythrocyte sedimentation rate Therapeutic drug concentrations Coagulation studies Arterial, capillary, and venous blood gases Detection of bacterial, viral, and fungal pathogens Urinalysis	1	

Competency	Goals and Objectives	Level of Training	Completed
	Cerebrospinal fluid analysis Gram stain Stool studies Other fluid studies (e.g. pleural fluid, joint fluid) Electrocardiogram		
PC	2.3.3 Use common imaging or radiographic studies when indicated for patients on the inpatient unit. Plain radiographs of the chest, extremities, abdomen, skull, sinuses Other imaging techniques such as CT, MRI, angiography, ultrasound, nuclear scans, contrast studies (interpretation not expected) Echocardiogram	1	
	2.4. GOAL: Monitoring and Therapeutic Modalities (Inpatient). Understand how to use physiologic monitoring and special technology in the general inpatient setting, including issues specific to care of the chronically ill child.		
MK, PC	2.4.1 Demonstrate understanding of the monitoring techniques and special treatments commonly used in the inpatient setting, by being able to: Discuss indications, contraindications and complications. Demonstrate proper use of technique for children of varying ages. Determine which patients need continuous monitoring or special monitoring (e.g., neurological checks). Interpret and respond appropriately to results of monitoring based on method used, age and clinical situation.	1,2	
PC	2.4.2 Use appropriate monitoring techniques in the inpatient setting. Monitoring of temperature, blood pressure, heart rate, respirations Cardiac monitoring Pulse oximetry	1,2	
PC	2.4.3 Use appropriately the treatments and techniques used in the inpatient setting.	1,2	

Competency	Goals and Objectives	Level of Training	Completed
	Universal precautions Nasogastric tube placement Administration of nebulized medication Injury, wound and burn care Oxygen delivery systems I.V. fluids I.V. pharmacotherapy (antibiotics, antiepileptics, etc.) Transfusion therapy		
MK	2.4.4 Describe key issues in the inpatient and home management of the technology-dependent child with the following care needs: Tracheostomy Chronic mechanical ventilation Chronic parenteral nutrition (HAL) Gastrostomy tube for feedings Permanent central venous catheter	2,3	
PC	2.4.5 Recognize normal and abnormal findings at tracheostomy, gastrostomy, or central venous catheter sites, and demonstrate appropriate intervention or referral for problems encountered.	2,3	
PC	2.4.6 Demonstrate the skills for assessing and managing pain. Use age-appropriate pain scales in assessment. Describe indications for use and side effects of common narcotic and non-narcotic analgesics. Administer medications to control pain in appropriate dose, frequency and route. Describe indications for and use of behavioral techniques and supportive care, and other non-pharmacologic methods of pain control.	2,3	

Competency	Goals and Objectives	Level of Training	Completed
	2.5. GOAL: Pediatric Competencies in Brief (Inpatient): Demonstrate high standards of professional competence while working with patients on the Inpatient Service. [For details see Pediatric Competencies.]		
	2.5.1 Competency 1: Patient Care. Provide family-centered patient care that is development- and age-appropriate, compassionate, and effective for the treatment of health problems and the promotion of health.	2	
PC	2.5.1.1 Use a logical and appropriate clinical approach to the care of hospitalized patients, applying principles of evidence-based decision-making and problem-solving, demonstrating: Careful data collection and synthesis Appropriate orders for vital signs, I & Os, medications, nutrition, activity Well thought-out daily care plans Good clinical judgment and decision-making Careful discharge plans (orders, patient education, followup)	1,2,3	
PC	2.5.1.2 Provide sensitive support to patients with acute and chronic illnesses and to their families, and arrange for ongoing support and preventive services at discharge.	1,2	
MK	2.5.2 Competency 2: Medical Knowledge. Understand the scope of established and evolving biomedical, clinical, epidemiological and social-behavioral knowledge needed by a pediatrician; demonstrate the ability to acquire, critically interpret and apply this knowledge in patient care.	3	
MK	2.5.2.1 Demonstrate a commitment to acquiring the base of knowledge needed to care for children in the inpatient setting.	1,2,3	
MK	2.5.2.2 Know and/or access medical information efficiently, evaluate it critically, and apply it to inpatient care appropriately.	1,2,3	
ICS	2.5.3 Competency 3: Interpersonal Skills and Communication. Demonstrate interpersonal and communication skills that result in information exchange and partnering with patients, their families and professional associates.	1,2,3	
ICS	2.5.3.1 Provide effective patient education, including reassurance, for condition(s) commonly seen on the inpatient service.	1,2,3	
ICS	2.5.3.2 Participate and communicate effectively as part of an interdisciplinary team, as both the primary provider and the consulting pediatrician (e.g., patient presentations, sign-out rounds, communication with consultants and primary care physicians of	2	

Competency	Goals and Objectives	Level of Training	Completed
	hospitalized patients).		
ICS	2.5.3.3 Develop effective strategies for teaching students, colleagues, other professionals and laypersons.	3	
ICS	2.5.3.4 Maintain accurate, legible, timely and legally appropriate medical records.	1	
PBLI	2.5.4 Competency 4: Practice-based Learning and Improvement. Demonstrate knowledge, skills and attitudes needed for continuous self-assessment, using scientific methods and evidence to investigate, evaluate and improve one's patient care practice.	1,2,3	
PBLI	2.5.4.1 Use scientific methods and evidence to investigate, evaluate and improve one's patient care practice in the inpatient setting.	1,2,3	
PBLI	2.5.4.2 Identify personal learning needs, systematically organize relevant information resources for future reference, and plan for continuing acquisition of knowledge and skills.	1,2,3	
PR	2.5.5 Competency 5: Professionalism. Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diversity.	1,2,3	
PR	2.5.5.1 Demonstrate personal accountability to the well being of patients (e.g., following-up on lab results, writing comprehensive notes, and seeking answers to patient care questions).	1,2,3	
PR	2.5.5.2 Demonstrate a commitment to professional behavior in interactions with staff and professional colleagues.	1,2,3	
PR	2.5.5.3 Adhere to ethical and legal principles, and sensitivity to diversity while providing care in the inpatient setting.	1,2,3	
SBP	2.5.6 Competency 6: Systems-Based Practice. Understand how to practice high-quality health care and advocate for patients within the context of the health care system.	3	
SBP	2.5.6.1 Identify key aspects of health care systems, cost control, billing and reimbursement in the hospital inpatient setting.	3	
SBP	2.5.6.2 When providing care in the inpatient setting, consider cost and resource allocation without compromising quality of care.	3	
SBP	2.5.6.3 Take steps to avoid medical errors by recognizing the limits of one's knowledge and expertise; work with the health care team to recognize and address systems errors.	1,2,3	
PC, MK	**2.6 GOAL: Technical and Therapeutic Procedures.** Describe the following procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice. Arterial puncture - 2 Bladder catheterization - 1 Central Line: use/care -3 Chest Physiotherapy -1 Gastric tube Placement (OG/NG) -2	1,2,3	

Competency	Goals and Objectives	Level of Training	Completed
	Gastrostomy tube replacement -2 IV line placement -1 Lumbar Puncture -1 Medication Delivery: IV -2 Pulmonary function tests: peak flow meter -1 Pulse oximeter: placement -1 Sterile technique -1 Suctioning: nares -2 Suctioning: oral pharynx -2 Suctioning: tracheostomy -2 Tracheostomy tube: replacement -3 Venipuncture -1		
PC, MK	**2.7 GOAL: Diagnostic and Screening Procedures.** Describe the following tests or procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice. ECG: emergency interpretation -2 Electroencephalogram (EEG) -2 pH probe -2 PPD: interpretation -1 Monitoring interpretation: cardiac -2 Monitoring interpretation: pulse oximetry -2 Monitoring interpretation: respiratory -1 Radiologic interpretation: abdominal x-ray – 1 Radiologic interpretation: chest x-ray -1 Radiologic interpretation: CT of head -3 (w/consultation) Radiologic interpretation: extremity x-ray -2 Radiologic interpretation: MRI of head -3 (w/consultation) Radiologic interpretation: renal ultrasound -3 (w/consultation) Radiologic interpretation: skeletal x-ray (incl abuse) -2 (w/consultation) Radiologic interpretation: skull film for fracture -2 (w/consultation) Radiologic interpretation: sinus films -2 Radiologic interpretation: voiding cystourethrogram -3(w/consultation)	1,2,3	
PBLI	**2.8. GOAL: Generating Questions and Retrieving Information**. Generate answerable clinical questions and use information technology to gather information and support decision-making and patient management. **(Special Night Float G&O)**		
PBLI	2.8.1 Generate patient-centered clinical questions to drive continued knowledge acquisition and support informed decision-making.	2,3	

Competency	Goals and Objectives	Level of Training	Completed
	1. Use a standard format to phrase clinical questions (e.g., PICO = Patient/Problem, Intervention, Comparison Intervention, Outcome) in order to perform an efficient literature search. 2. Complete a weekly Clinically Appraised Topic. 3. Identify which questions are most important to address during or after a patient encounter, based on what is most important for patient care or one's own learning needs, and discuss with postcall attending each AM.		

Procedure Supplement for Inpatient Rotation

Johns Hopkins: The Harriet Lane Handbook: A Manual for Pediatric House Officers, 17th ed.

Chapter 3 – Procedures *(Pages 73 – 104)*

Nicole Shilkofski MD

GENERAL GUIDELINES

CONSENT

It is crucial to obtain informed consent from the parent or guardian before performing any procedure by explaining the procedure, the indications, any risks involved, and any alternatives. Obtaining consent for life-saving emergency procedures is unnecessary.

RISKS

1. All invasive procedures involve pain and risk for infection and bleeding. Specific complications are listed by procedure.
2. Sedation and analgesia should be planned in advance, and the risks of such explained to the parent and/or patient as applicable. In general, 1% lidocaine buffered with sodium bicarbonate is adequate for local analgesia.
3. Universal precautions should be followed for all patient contact that exposes the health care provider to blood, amniotic fluid, pericardial or pleural fluid, synovial fluid, cerebrospinal fluid, semen, or vaginal secretions.
4. Proper sterile technique is crucial to achieve good wound closure, decrease transmittable diseases, and prevent wound contamination.

INTRAVENOUS PLACEMENT AND ACCESS SITES

1. **Indications:** To obtain access to peripheral venous circulation to deliver fluid, medications, or blood products.
2. **Complications:**
    a. Thrombosis.
    b. Infection.
3. **Procedure:**
    a. Choose intravenous (IV) placement site and prepare with alcohol.
    b. Apply tourniquet and then insert IV catheter, bevel up, at angle almost parallel to the skin, advancing until “flash” of blood is seen in the catheter hub. Advance the plastic catheter only, remove the needle, and secure the catheter.
    c. After removing tourniquet, attach T connector filled with saline to the catheter, flush with several mL of normal saline (NS) to ensure patency of the IV line.

RADIAL ARTERY PUNCTURE [1] [2]

1. **Indications:** Arterial blood sampling.
2. **Complications:** Infection, bleeding, occlusion of artery by hematoma or thrombosis, ischemia if ulnar circulation is inadequate.
3. **Procedure:**
    a. Before procedure, test adequacy of ulnar blood flow with the Allen test. Clench the hand while simultaneously compressing ulnar and radial arteries. The hand will blanch. Release pressure from the ulnar artery, and observe the flushing response. Procedure is safe to perform if entire hand flushes.
    b. Locate the radial pulse. It is optional to infiltrate the area over the point of maximal impulse with lidocaine. Avoid infusion into the vessel by aspirating before infusing. Prepare the site in sterile fashion.
        1. Puncture: Insert butterfly needle attached to a syringe at a 30- to 60-degree angle over the point of maximal impulse; blood should flow freely into the syringe in a pulsatile fashion; suction may be required for plastic tubes. Once the sample is obtained, apply firm, constant pressure for 5 minutes and then place a pressure dressing on the puncture site.

URINARY BLADDER CATHETERIZATION [2]

1. **Indications:** To obtain urine for urinalysis and culture sterilely and to accurately monitor hydration status.
2. **Complications:** Hematuria, infection, trauma to urethra or bladder, intravesical knot of catheter (rarely occurs).
3. **Contraindications:** Pelvic fractures, known trauma to the urethra, or blood at the meatus.
4. **Procedure:**
    a. Infant/child should not have voided within 1 hour of procedure.
    b. Prepare the urethral opening using sterile technique.
    c. In boys, apply gentle traction to the penis to straighten the urethra.
    d. Gently insert a lubricated catheter into the urethra. Slowly advance the catheter until resistance is met at the external sphincter. Continued pressure will overcome this resistance, and the catheter will enter the bladder. In girls, the urethral orifice may be difficult to visualize, but it is usually immediately anterior to the vaginal orifice. Only a few centimeters of advancement is required to reach the bladder in girls. In boys, insert a few centimeters longer than the shaft of the penis.
    e. Carefully remove the catheter once the specimen is obtained, and cleanse skin of iodine.
    f. If indwelling Foley catheter is inserted, inflate balloon with sterile water as indicated on bulb, then connect catheter to drainage tubing attached to urine drainage bag. Secure catheter tubing to inner thigh.

LUMBAR PUNCTURE [1] [2]

1. **Indications:** Examination of spinal fluid for suspected infection or malignancy, instillation of intrathecal chemotherapy, or measurement of opening pressure.
2. **Complications:** Local pain, infection, bleeding, spinal fluid leak, hematoma, spinal headache, or acquired epidermal spinal cord tumor (caused by implantation of epidermal material into spinal canal if no stylet is used on skin entry).
3. **Cautions and contraindications:**
    a. **Increased ICP:** Before lumbar puncture (LP), perform funduscopic examination. The presence of papilledema, retinal hemorrhage, or clinical suspicion of increased ICP may be contraindications to the procedure. A sudden drop in intraspinal pressure by rapid release of cerebrospinal fluid (CSF) may cause fatal herniation. If LP is to be performed, proceed with extreme caution. Computed tomography (CT) may be indicated before LP if there is suspected intracranial bleeding, focal mass lesion, or increased ICP. A normal CT scan does not rule out increased ICP but usually excludes conditions that may put the patient at risk for herniation. Decision to obtain CT should not delay appropriate antibiotic therapy if indicated.
    b. **Bleeding diathesis:** A platelet count >50,000/mm^3 is desirable before LP, and correction of any clotting factor deficiencies can minimize the risk for bleeding and subsequent cord or nerve root compression.
    c. Overlying skin infection may result in inoculation of CSF with organisms.
    d. LP should be deferred in an unstable patient, and appropriate therapy should be initiated, including antibiotics if indicated.
4. **Procedure:**
    a. Apply local anesthetic cream if sufficient time is available.
    b. Position child in either sitting position (Fig. 3–9) or lateral recumbent position (Fig. 3–10), with hips, knees, and neck flexed. Do not compromise a small infant's cardiorespiratory status by positioning.
    c. Locate the desired intervertebral space (either L3–4 or L4–5) by drawing an imaginary line between the top of the iliac crests.
    d. Prepare the skin in sterile fashion. Drape conservatively so that it is possible to monitor the infant. Use a 20- to 22-gauge spinal needle with stylet (1.5-inch for children younger than 12 years of age, 3.5 inches for children 12 years and older). A smaller-gauge needle will decrease the incidence of spinal headache and CSF leak.
    e. The overlying skin and interspinous tissue can be anesthetized with 1% lidocaine using a 25-gauge needle.
    f. Puncture the skin in the midline just caudad to the palpated spinous process, angling slightly cephalad toward the umbilicus. Advance several millimeters at a time and withdraw the stylet frequently to check for CSF flow. The needle may be advanced without the stylet once it is completely through the skin. In small infants, one may *not* feel a change in resistance or "pop" as the dura is penetrated.
    g. If resistance is met initially (you hit bone), withdraw needle to the skin surface and redirect angle slightly.
    h. Send CSF for appropriate studies. Send the first tube for culture and Gram stain, the second tube for measurement of glucose and protein levels, and the last tube for cell count and differential. An additional tube can be collected for viral cultures, polymerase chain reaction (PCR), or CSF metabolic studies if indicated. If subarachnoid hemorrhage or traumatic tap is suspected, send the first and fourth tubes for cell count, and ask the laboratory to examine the CSF for xanthochromia.
    i. Accurate measurement of CSF pressure can be made only with the patient lying quietly on his or her side in an unflexed position. It is not a reliable measurement in the sitting position. Once free flow of spinal fluid is obtained, attach the manometer and measure CSF pressure. Opening pressure is recorded as level at which CSF is steady.

Figure 3-9 Lumbar puncture site in the sitting position. *(From Dieckmann R, Selbst S: Pediatric Emergency and Critical Care Procedures. St. Louis, Mosby, 1997.)*

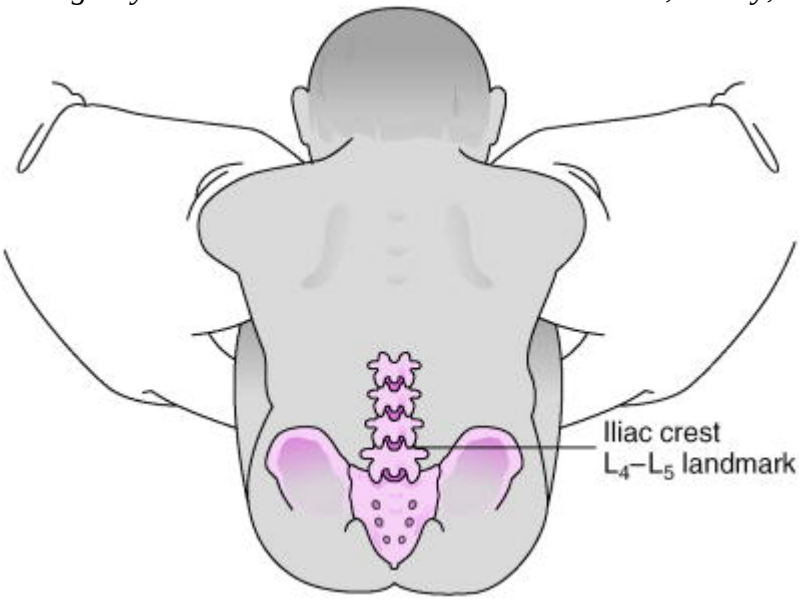
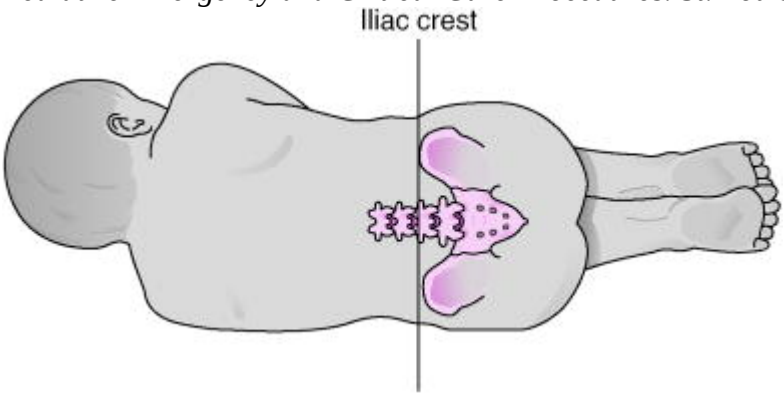


Figure 3-10 Lumbar puncture site in lateral (recumbent) position. *(From Dieckmann R, Selbst S: Pediatric Emergency and Critical Care Procedures. St. Louis, Mosby, 1997.)*



REFERENCES

1. Fleisher G, Ludwig S: Pediatric Emergency Medicine, 3rd ed. Baltimore: Williams & Wilkins; 2000.

2. Dieckmann R, Fiser D, Selbst S: Illustrated Textbook of Pediatric Emergency and Critical Care Procedures. St. Louis, Mosby, 1997.

3. Nichols DG, et al: Golden Hour: The Handbook of Advanced Pediatric Life Support. St. Louis, Mosby, 1996.

4. Barone MA, Rowe PC: Pediatric procedures. In Oski's Pediatrics: Principles and Practice, 3rd ed. Baltimore, Lippincott Williams & Wilkins, 1999.

5. Howe PM, et al: Etiologic diagnosis of cellulitis: Comparison of aspirates obtained from the leading edge and the point of maximal inflammation. Pediatr Infect Dis J 1987;6(7):685.