SPECIALISED PROCEDURES

LUMBAR PUNCTURE

- OBJECTIVES;
- Define lumbar puncture
- Discuss pre procedure activities
- Describe the procedure
- Name post procedure complications and management
- Discuss nurses role

Lumbar Puncture

- Definition ;A lumbar puncture (spinal tap) is carried out by inserting a needle into the lumbar subarachnoid space to withdraw CSF.

Indications;

- to obtain CSF for examination,
- to measure and reduce CSF pressure,
- to determine the presence or absence of blood in the CSF,
- to administer medications intrathecally (into the spinal canal).

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- CSF pressure with the patient in a lateral recumbent position is normally 50 to 1800 mm H2O (Karpoff & Labus, 2008)
- insertion of the needle below the level of the third lumbar vertebra prevents puncture of the spinal cord.
- A successful lumbar puncture requires that the patient be relaxed; an anxious patient is tense, and this may increase the pressure reading.

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- A lumbar puncture may be risky in the presence of an intracranial mass lesion because intraspinal pressure is decreased by removal of CSF, and the brain may herniate downward through the foramen magnum

Characteristics of CSF

- CSF pressure with the patient in a lateral recumbent position is normally 50 to 1800 mm H2O (Karpoff & Labus, 2008
- The CSF should be;
- clear and colorless.
- Pink, blood-tinged, or grossly bloody CSF may indicate a subarachnoid hemorrhage.
- The CSF may be bloody initially because of local trauma but becomes clearer as more fluid is drained.
- Specimens are obtained for cell count, culture, glucose, protein, and other tests as indicated.
- The specimens should be sent to the laboratory immediately because changes will take place and alter the result

Pre procedure

- 1. Determine whether written consent for the procedure has been obtained.
- 2. Explain the procedure to the patient and describe sensations during the procedure (ie, a sensation of cold as the site is cleansed with solution, a needle prick when local anesthetic agent is injected).
- 3. Determine whether the patient has any questions or misconceptions about the procedure; reassure the patient that the needle will not enter the spinal cord or cause paralysis.
- 4. Instruct the patient to void before the procedure.

Procedure

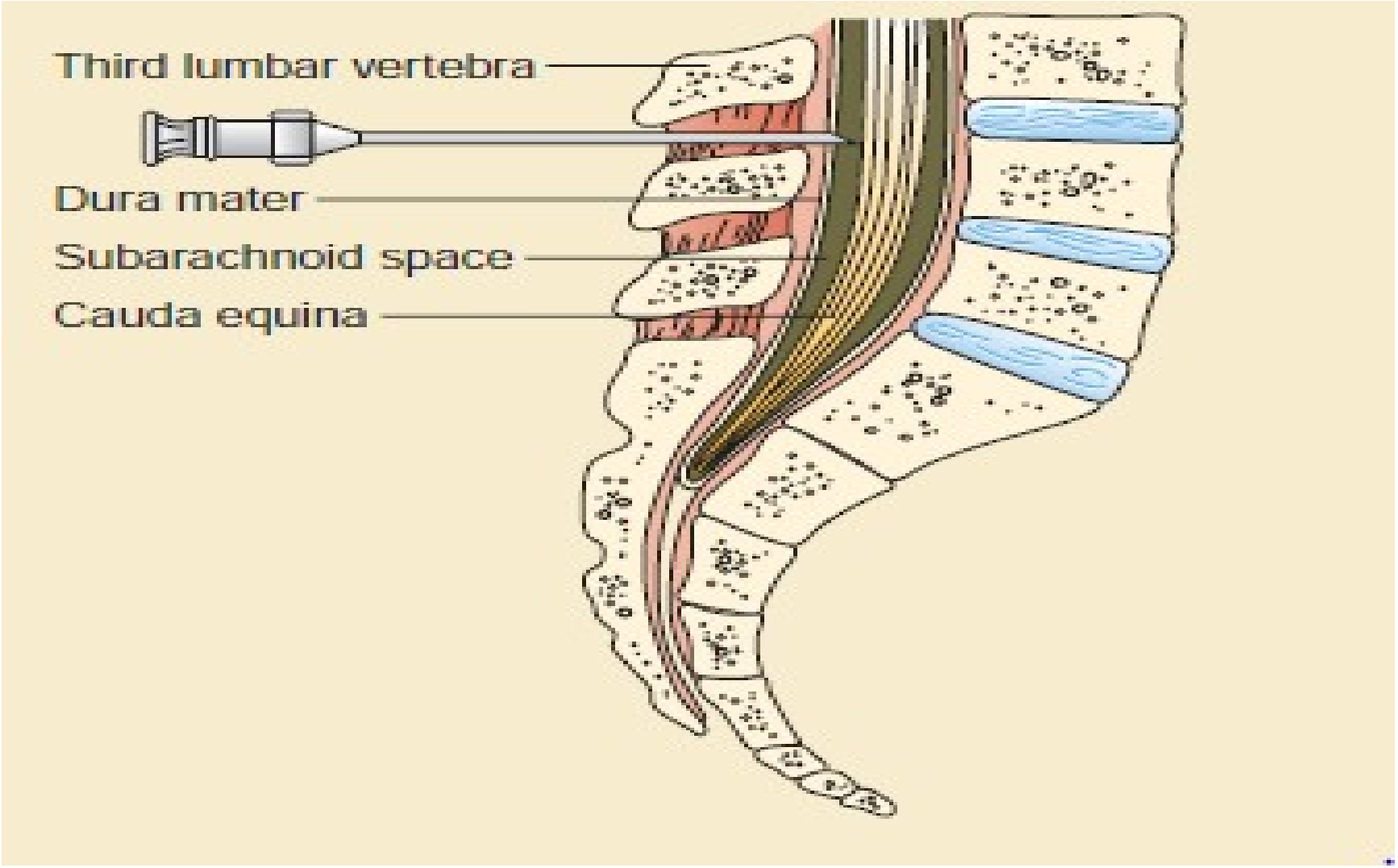
- 1. The patient is positioned on one side at the edge of the bed or examining table with back toward the physician;
- the thighs and legs are flexed as much as possible to increase the space between the spinous processes of the vertebrae, for easier entry into the subarachnoid space.
- 2. A small pillow may be placed under the patient's head to maintain the spine in a horizontal position; a pillow may be placed between the legs to prevent the upper leg from rolling forward

Position used in the procedure

Site of insertion

- A needle is inserted into the subarachnoid space through the third and fourth or fourth and fifth lumbar interface to withdraw spinal fluid

Lumbar puncture site between3rd and 4th lumbar vertebra



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- 3. The nurse assists the patient to maintain the position to avoid sudden movement, which can produce a traumatic (bloody) tap.
- 4. The patient is encouraged to relax and is instructed to breathe normally, because hyperventilation may lower an elevated pressure

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- 5. The nurse describes the procedure step by step to the patient as it proceeds.
- 6. The physician cleanses the puncture site with an antiseptic agent solution and drapes the site. 7. The physician injects local anesthetic agent to numb the puncture site, and then inserts a spinal needle into the subarachnoid space through the third and fourth or fourth and fifth lumbar interspace. A pressure reading may be obtained.

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- 8. A specimen of CSF is removed and usually collected in three test tubes, labeled in order of collection. The needle is withdrawn.
- 9. The physician applies a small dressing to the puncture site.
- 10. The tubes of CSF are sent to the laboratory immediately

Postprocedure

- 1. Instruct the patient to lie prone for 2 to 3 hours to separate the alignment of the dural and arachnoid needle punctures in the meninges, to reduce leakage of CSF.
- 2. Monitor the patient for complications of lumbar puncture; notify physician if complications occur.
- 3. Encourage increased fluid intake to reduce the risk of postprocedure headache

Post
lumbar puncture complications

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A post–lumbar puncture headache,

- range from mild to severe,
- may occur a few hours to several days after the procedure.
- occurs in 15% to 30% of patients.
- It is a throbbing bifrontal or occipital headache, dull and deep in character.
- It is severe on sitting or standing but lessens or disappears when the patient lies down

Cause of the headache

- CSF leakage at the puncture site into the tissues by way of the needle track from the spinal canal.
- Thus the supply of CSF in the cranium is depleted to a point at which it is insufficient to maintain proper mechanical stabilization of the brain.
- When the patient assumes an upright position, tension and stretching of the venous sinuses and pain-sensitive structures occur.

Prevention of post lumbar headache

- Avoid by using a small-gauge needle
- the patient remains prone after the procedure.

- When more than 20 mL of CSF is removed, the patient is positioned supine for several hours.
- Keeping the patient flat overnight may reduce the incidence of headaches.

Management of post lumbar puncture headache

- Bed rest,
- analgesic agents,
- hydration.
- If the headache persists, the epidural blood patch technique may be used.
- Blood is withdrawn from the antecubital vein and injected into the epidural space, usually at the site of the previous spinal puncture that the blood acts as a gelatinous plug to seal the hole in the dura, preventing further loss of CSF.

Other Complications of Lumbar Puncture

- Herniation of the intracranial contents,
- spinal epidural abscess,
- spinal epidural hematoma,
- meningitis are rare but serious complications of lumbar puncture.
- temporary voiding problems,
- slight elevation of temperature,
- backache or spasms,
- Neck stiffness.

Nurses role in the procedure

- Explain the procedure to the patient
- Ensure that there is a written consent before the procedure
- Listen to the patient and reassure step by step
- Assist physician patient in setting the equipment and positioning the patient
- Label the specimen and sent it to the laboratory immediately
- Monitor patient for any complications
- Health educate the patient and family on home care and follow up

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END

paracentesis

objectives

- By the end of the lesson the learner should be able to;
- Define paracentesis
- Name its indications
- Discuss pre procedure preparation
- Discuss the procedure
- Discuss the role of the nurse

Paracentesis

- Paracentesis is the removal of fluid (ascites) from the peritoneal cavity through a puncture or a small surgical incision through the abdominal wall under sterile conditions.
- Ultrasound guidance may be indicated in some patients who are at high risk for bleeding because of an abnormal coagulation profile and in those who have had previous abdominal surgery and may have adhesions.

Indication

- Paracentesis was once considered a routine form of treatment for ascites
- It is now performed primarily for diagnostic examination of ascitic fluid;
- for treatment of massive ascites that is resistant to nutritional and diuretic therapy and that is causing severe problems to the patient;
- and as a prelude to diagnostic imaging studies, peritoneal dialysis, or surgery.
- Laboratory test of ascitic fluid is collected for cell count, albumin and total protein levels, culture, and other tests.

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- Large-volume (5 to 6 L) paracentesis has been shown to be a safe method for treating patients with severe ascites in combination with the IV infusion of salt-poor albumin or other colloid, has become a standard management strategy for an immediate effect.
- Refractive, massive ascites is unresponsive to multiple diuretics and sodium restriction for 2 weeks or more and can result in severe sequelae such as respiratory distress, which requires rapid intervention.
- Albumin infusions help to correct decreases in effective arterial blood volume that lead to sodium retention.

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- Use of this colloid reduces the incidence of postparacentesis circulatory dysfunction with renal dysfunction, hyponatremia, and rapid reaccumulation of ascites associated with decreased effective arterial volume (Hauser, et al., 2006)
- The beneficial effects of albumin administration on hemodynamic stability and renal functional status may be related to an improvement in cardiac function as well as a decrease in the degree of arterial vasodilation.

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- Although the patient with cirrhosis has a greatly increased extracellular blood volume, the kidney incorrectly senses that the effective volume has decreased.
- The renin–angiotensin–aldosterone axis is stimulated, and sodium is reabsorbed
- antidiuretic hormone (ADH) secretion increases, which leads to increased retention of free water and sometimes to the development of dilutional hyponatremia.
- Therapeutic paracentesis provides only temporary removal of fluid; ascites rapidly recurs, necessitating repeated fluid removal.

Equipment

Paracentesis tray (contains trocar, syringe, needles, drainage tube)

- Sterile gloves
- Antiseptic solution
- Local anesthetic
- Sterile dressing
- • Drainage collection bottles, receptacles
- Sphygmomanometer to monitor Blood pressure

Nursing Interventions Rationale

Guidelines for Assisting With a Paracentesis

Preprocedure

1. Check for signed consent form.
2. Prepare the patient by providing the necessary information and instructions and by offering reassurance.
3. Instruct the patient to void.
4. Gather appropriate sterile equipment and collection receptacles.
5. Place the patient in upright position on the edge of the bed or in a chair with feet supported on a stool. Fowler's position should be used by the patient confined to bed.
6. Place the sphygmomanometer cuff around patient's arm

Rationale

- 1. Ensures that patient has agreed to procedure.
- 2. Having information increases the patient's understanding of the procedure and the reason for it. 3. An empty bladder minimizes the risk of inadvertent puncture of the bladder and minimizes discomfort from a full bladder.
- 4. Sterility of equipment is essential to minimize risk of infection; having equipment available enables the procedure to be performed smoothly.
- 5. An upright position results in movement of the peritoneal fluid close to the abdominal wall and promotes easier puncture and removal of fluid.
- 6. This allows the nurse to monitor the patient's blood pressure during procedure.

Procedure

- 1. The physician, using aseptic technique, inserts the trocar through a puncture below the umbilicus. The trocar or needle is connected to a drainage tube, the end of which is inserted into a collecting receptacle.
- 2. Help the patient maintain position throughout the procedure.
- 3. Measure and record blood pressure at frequent intervals throughout the procedure.
- 4. Monitor the patient closely for signs of vascular collapse: pallor, increased pulse rate, or decreased blood pressure

rationale

- 1. Sterile technique minimizes the risk of infection. Bleeding at the puncture site is minimal at this location. The fluid drains by gravity or mild siphon into the container.
- 2. The patient who is fatigued or weak may have difficulty maintaining an optimal position for drainage of fluid.
- 3. Decreased blood pressure may occur with vascular collapse, which can result from removal of the fluid from the peritoneal cavity and fluid shifts. 4. Vascular collapse (hypovolemia) may occur as fluid moves from the vascular system to replace fluid drained from peritoneal cavity.