

SPINAL DRAIN PROTOCOL

Purpose: To outline the Care and management of the patient with a spinal drain.

Level: Interdependent (*requires a physician/provider order)

Supportive Data:

1. Endovascular repair of the thoracic aorta is associated with an incidence of spinal cord ischemia (SCI) of 3-12% (1). Critical blood supply to the spinal cord may be obstructed by this procedure. Lumbar Cerebral Spinal Fluid (CSF) pressure monitoring and drainage has been used as both prophylaxis and treatment of SCI.
2. Spinal cord perfusion pressure (SCPP) is determined by Mean Arterial Pressure (MAP) minus CSF pressure (**MAP- CSF pressure = SCPP**). Therefore, lowering the CSF pressure may improve perfusion.
3. Monitoring CSF pressure and treating pressures equal to or greater than 10-12 mmHg for up to 3 days may enhance spinal cord perfusion.
4. The spinal drain is placed by anesthesia in the OR. The average amount of CSF the body makes is 25 mL per hour.
5. Patient management also includes:
 - Maintaining Systolic Blood Pressure (SBP) between 160-180 mmHg
 - Monitor changes in motor and sensory function
 - Active drainage of CSF if fluid pressure exceeds 10 mm Hg

FLUID FILLED TRANSDUCER SPINAL DRAIN

Equipment

- Single Disposable Transducer Kit & Epidural Catheter Insertion Kit (for prep and local medication)
- 100 mL Bag of **PRESERVATIVE FREE SALINE**
- Stop cock
- 24” Pressure Line
- Sterile Red Cap
- Single White Board
- C-Clamp & IV Pole
- Two 10 mL Syringes

Procedure

1. Put the C-Clamp on the pole with white board—label it **“Spinal Drain-Do Not Flush”**
2. Open transducer and place in a white board
3. Tighten all connections on transducer
4. Hang Preservative Free Saline
5. Take off tubing from transducer and unravel
6. Discard the 12” tubing from the distal end of the line below the stopcock
7. Add a second stopcock along with a 24” pressure line to connect to the lumbar drain
8. Add a 10 mL syringe to the second stopcock and connect spinal drainage bag
9. Spike Preservative Free Saline Bag--Flush transducer and tubing with preservative free NS **PRIOR TO CONNECTING THE SYSTEM TO THE DRAIN**
10. Prime transducer monitoring system by pulling the red “pig tail,” removing all air from the system
11. Replace vented caps on stopcocks with sterile dead end caps

12. Disconnect Preservative Free Flush bag and dead-end Flush port with a sterile red dead end cap.
13. Level the **transducer** to the level of the spinal column--**3 cm above the bed of the mattress**. Zero system.
14. Connect spinal drain into transducer at the first stopcock
15. **Drainage bag** at 0 mmHg (unless ordered otherwise) in relationship to **patient's mid-ear**
16. Stopcock must be turned off to drainage bag x 1 minute for accurate readings
17. * CSF will be sent for culture if drain is to remain in greater than 3 days

Patient Assessment Post-Surgical Procedure

1. Neurological status: mentation every hour
2. Neurovascular status: motor and sensory function (able to lift lower extremity off the bed and muscle strength) every hour.
3. Lumbar Drainage system:
 - a. Assess Spinal dressing: occlusive, dry and intact every shift
 - b. Secured and close system every hour
 - c. Lumbar catheter free from bends or kinks every hour
 - d. Drainage for amount, color consistency every hour
4. CSF pressure every hour. Patient is flat, NO reverse trendelenburg.
5. Vital Signs: BP, P, RR every hour. Temperature every 4 hours.
 - a. Maintain SBP 160 to 180 mmHg
 - b. Maintain MAP greater than 70 mmHg
6. Pain assessment as per unit standard.
7. Urinary output every hour
8. Drainage of CSF when pressure is above 10 mm Hg (Active)
 - a. Have patient flat in bed
 - b. Turn stopcock off to the transducer and off to the drainage bag
 - c. Gently withdraw 10 mL CSF over 1 minute. Fluid should flow easily-do not exert a lot of pressure.
 - d. Turn stopcock off to spinal drain and remove the 10 mL syringe filled with CSF
 - e. Replace a sterile 10 mL syringe onto the stopcock and discard CSF
 - f. Open the stopcock to the transducer
 - g. Recheck lumbar pressure after 1 minute. If greater than 10 mmHg, may repeat active withdraw of 10 mL (total of 20 mL)
 - h. If pressure less than 10 mmHg, keep drainage bag closed and monitor pressure every hour
 - i. **If pressure greater than 10 mmHg after active withdraw of 20 mL's of CSF, contact the attending physician for further orders**
 - j. Record drainage amount at bedside I & O
9. Vascular Surgery will be notified of any reportable conditions which require evaluation of the patient to obtain appropriate consults and medical imaging studies as directed
10. If indicated, notify Anesthesia for repositioning/replacement/removal of the spinal drain

REPORTABLE CONDITIONS

- If patient complains of headache, stop drainage immediately and contact the attending physician
- Lower extremity function (medical emergency) or worsening in neurovascular status
- Any signs and symptoms of infection

EMERGENCY MEASURES

For accidental separation of drainage bag:

- DO NOT reconnect

- Clamp off tubing to drain site with covered Kelly clamp and cover tubing end with sterile 2 x 2
- Notify Anesthesia for the removal of the drain

SAFETY

- Do **NOT** inject anything into the spinal drainage system
- Maintain patient on strict bed rest
- DO **NOT** heparinize the patient or use other anticoagulation while drain is in place. Remove drain if anticoagulation needed.
- Utilize caution labels to identify spinal drain. Label transducer “**Spinal Drainage Only—Do NOT Flush**”

Patient or significant other education

Instruct the patient/significant other in the following:

1. Purpose of the spinal drain
2. To report to the nurse pain at insertion site or change in sensation/movement of extremities

Discontinuation of Lumbar Drain

1. The lumbar drain will be discontinued per physician/provider order from the attending vascular surgeon
2. When the lumbar drain is discontinued, maintain a closed system and notify anesthesia for removal
3. Patient must remain in a supine position for 4 to 6 hours after lumbar drain is discontinued
4. The patient will be monitored for motor and sensory status for 30 minutes times 2, then hourly times 4 hours, then every 4 hours for 24 hours

Documentation

Document the following in the patient record:

1. Assessment data-CSF pressure will appear on the VS flow sheet
2. Spinal drainage (amount, color, consistency)
3. Amount of fluid removed to maintain pressure of less than or equal to 10 mmHg
4. Effectiveness of care in relation to :
 - a. Neurological status
 - b. Presence of complications or difficulties with drainage system
5. Time of removal of catheter by anesthesia

REFERENCES:

1. A. T. Chung et al. Ann Thorac Surg, 2005, 80:1280-9

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