

## Home Care of the Epidural Analgesia Patient: The Nurse's Role

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### **Article:**

Spinal analgesia offers a viable alternative for many patients with cancer whose pain cannot be controlled by systemic narcotics. The success of this therapy depends largely on the effectiveness of the home health nurse in instructing patient and caregivers, monitoring catheter care, and assessing the patient's response to treatment. Chronic pain associated with cancer is frequently intractable and resistant to common therapeutic and noninvasive sensory-altering measures. Prolonged pain not only drains energy needed for normal activity but often causes the individual anxiety, depression, withdrawal, and preoccupation with the pain.<sup>1</sup>

Systemic narcotic doses required to control severe cancer pain are accompanied by central nervous system adverse effects that increase as the dosage of the drug increases. Sedation, euphoria, and depression precipitated by the analgesic are likely to disable the individual to the point that the ability to carry on normal activities of daily living is reduced.

A promising alternative to traditional pain control measures is spinal analgesia. Spinal narcotics used to treat pain of malignant origin was initially described in 1979.<sup>2</sup> Lower doses of narcotic agents are needed for effective pain control at the spinal cord level, and because of the segmental nature of analgesia produced, sensory, motor, and cognitive functioning remain unaltered.<sup>3</sup>

Waldman and others<sup>3</sup> identify five types of intraspinal delivery systems. The first type and simplest device consists of a catheter inserted into the epidural space. Another partially externalized system involves a catheter placed into the epidural space with subcutaneous tunneling to an exit site on the abdomen. In both of these systems the proximal end of the catheter is capped with an injection port through which analgesics are administered at predetermined intervals.

The third type of system involves a totally implanted epidural catheter with a subcutaneous injection site through which doses of narcotics are administered.

The last two types identified by Waldman et al are completely in-dwelling systems composed of an epidural catheter connected to an implanted mechanism for analgesic delivery. In the one implanted system, an epidural catheter is attached to a reservoir bag holding a quantity of medication. To release a dose of narcotic, the individual activates a sternally placed compression device.<sup>4</sup> In the other system the epidural catheter is attached to a reservoir with an implanted infusion pump that delivers a continuous, measured amount of drug. Although the individual or caregiver does not assume responsibility for injections of analgesics in these last two systems, they are expensive and subject to mechanical failure and they require more invasive installation.<sup>3-5</sup>

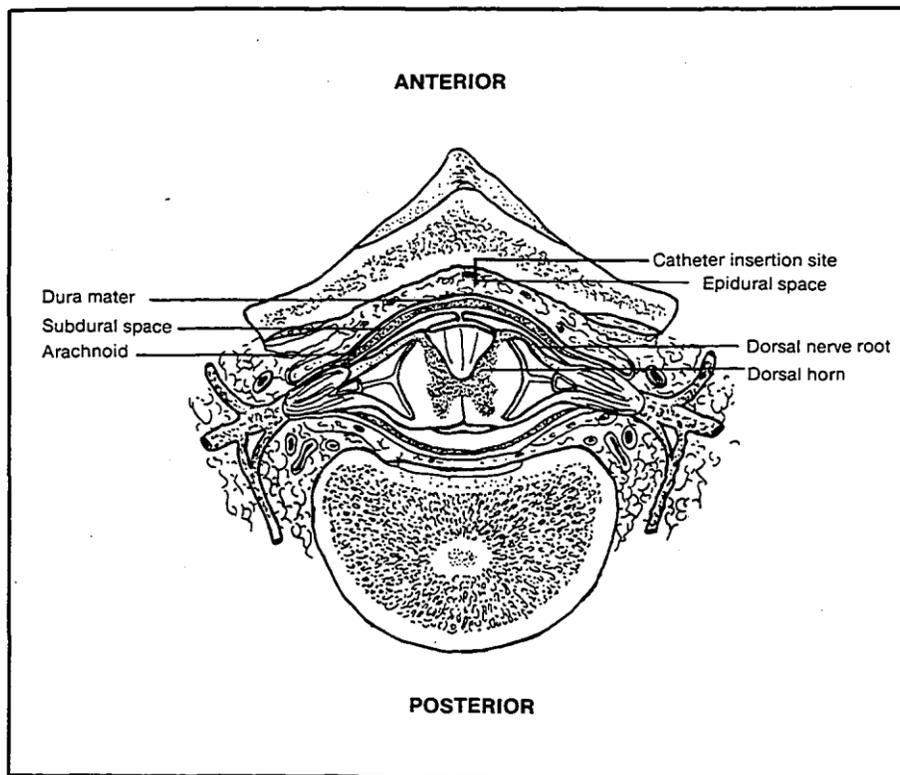
There are advantages and disadvantages to each intraspinal narcotic delivery system.<sup>4,6,7</sup> An evaluation of pain relief and adverse effects from epidural analgesia is initially made by using either a temporary percutaneous epidural catheter or a temporary percutaneous epidural catheter with subcutaneous tunneling before an implantable system is installed.<sup>3</sup>

## MECHANISM OF ACTION

**Understanding pain.** An understanding of spinal anatomy and physiology is important to understanding the mechanism of spinal analgesia in the management of pain. The outer layer of the spinal cord consists of a dense, fibrous connective tissue known as the dura mater (Figure 1). Between the dura mater and the wall of the vertebral canal is the epidural space. This space, made up of fat, connective tissue, and blood vessels, serves as a protective padding around the spinal cord. Inside the dura mater is the arachnoid, a delicate membrane. The area between the dura mater and the arachnoid is the subdural space, which contains serous fluid. The pia mater is a transparent, delicate membrane that adheres to the surface of the spinal cord. This inner space between the arachnoid and the pia mater is the subarachnoid space containing cerebral spinal fluid.<sup>8</sup>

From either side of the spinal cord extend the ventral (anterior) and dorsal (posterior) nerve roots along the entire length of the cord. Sensory nerve fibers carrying pain stimuli enter the dorsal root and ascend to the brain where sensations of pain are consciously perceived.<sup>9</sup> Pain sensations may be controlled by interrupting the pain impulse between the receptors and the brain.<sup>8</sup>

**Mechanism of analgesia.** Studies have shown that the superficial dorsal horn of the spinal cord contains a concentration of opioid receptors. When small doses of opioid drugs are introduced into the epidural spaces, the opioid receptors are activated and produce analgesia by segmentally blocking the function of the nerve fibers transmitting pain stimuli. The thickness of the dura mater may limit drug transfer to the central nervous system, and since smaller amounts of opiates are needed to produce pain relief, motor, sensory, and autonomic effects are reduced.<sup>10-12</sup> This direct action on the spinal cord can avoid common adverse effects—nausea, vomiting, sedation, and euphoria—associated with systemic administration of analgesics.<sup>11</sup>



**Figure 1. Cross-section of the spinal cord.**

**Administration of opiates.** The distal end of the spinal cord is required for use in administering analgesics because of the risk of opioid ascension and the resulting adverse effects of sedation and respiratory depression caused by sympathetic blocking. A small catheter is inserted into the epidural space, usually in the region between L3 and L4 vertebrae. The catheter is securely taped or sutured in place and a sterile dressing applied to the site.

Morphine is the most common opiate to be given epidurally. Any drug given epidurally must be preservative-free to avoid the neuro-toxic effects caused by some additives and preservatives. Because it has a lower solubility, morphine has a slow rate of uptake and tends to linger in the cerebral spinal fluid. This accounts for the 30 to 60 minutes delay in the onset of analgesia and its 8- to 24-hour duration of action.

## **PATIENT SELECTION**

The major criterion for patient selection in using spinal analgesia is the presence of pain uncontrolled by narcotic analgesics and adjunctive drugs.<sup>3</sup> The patient who experiences limiting adverse effects of analgesics, and continues to have intractable pain even though analgesics are used aggressively, is a candidate for epidural analgesia. The individual must be free of local and systemic infection, and must have sufficient platelet counts for adequate coagulation.<sup>11</sup>

The cerebral spinal fluid can act as a medium for redistribution of opioid narcotics. Therefore, central side effects are more likely to occur when the catheter is placed above the mid-thoracic level. The spinal route of opioid narcotics is usually reserved for patients having midline sacral or perineal pain.

## **NURSING ASSESSMENT AND INTERVENTION**

The home health care nurse is a valuable resource for the family and primary physician to ensure success of the epidural route of analgesia. Nursing care not-only involves assessment and care of the catheter but also includes thorough assessment and intervention to decrease stress and social isolation created by illness.

Ideally, the patient and/ or care-giver are taught prior to discharge from the hospital how to prepare the injection, administer the medication through the injection port, and perform dressing and cap changes. Mastery of these skills is critical to the safety of the client and sense of competence of those providing the care. Since these skills are rather high level, the caregiver and patient may experience feelings of anxiety and diminished confidence in carrying out this part of care.

A thorough review and return demonstration by the caregiver are essential prior to encouraging independent care. The nurse outlines a nursing care plan specific to management of the epidural catheter (Table 1).

Nursing assessment for the home patient on an epidural pain regimen includes observation for complications from the administration route (which are uncommon) and for side effects from the drugs used (which are more often seen). Assessment for adequate pain control and healing at the catheter site without evidence of infection are imperative. Caregiver or patient readiness to accept teaching and willingness to take responsibility for care must be assessed on an ongoing basis.

The use of a diary card (Figure 2) by the patient or caregiver provides the nurse with documentation of catheter care, medication administration, effects, and side effects. A printed card for the client also serves as a written reminder for care and observations to be made.

Side effects from medications, particularly the opiates, include: respiratory depression, pruritis, urinary retention, gastrointestinal symptoms, and tolerance.

***Respiratory effects.*** Respiratory depression most commonly occurs postoperatively and in the initial dosage adjustment period when the patient is still hospitalized. Depression of respirations can occur in the home, however, with increasing dosages or with administration of dosages that are too large. Those who are receiving additional pain medication by an alternate route are also at risk for respiratory depression. Yaksh noted that the loss of a pain stimulus by effective analgesia will itself constitute a depressant effect on respiration.<sup>12</sup>

Because of individual and environmental factors, there is a variable peak in the effect. Respiratory changes, therefore, may not be seen for as late as 10 hours after the administration of the drug. This potentially fatal

adverse effect can be reversed by careful monitoring of the patient's respiratory rate pre-dose and at 8 and 12 hours post-dose; observations for progressive slowing and decreasing in depth are included.

An emphasis on elevating the head of the bed and the importance of administering prescribed amounts of the drug slowly must be included in teaching. Both of these safeguards reduce the risk of the narcotic migrating upward to the supraspinal centers.

<b>Table 1. Care Plan for an Epidural Catheter</b>		
<b>NURSING DIAGNOSIS</b>	<b>EXPECTED OUTCOMES</b>	<b>NURSING INTERVENTIONS</b>
Alteration in comfort: chronic pain related to physiologic injury or ineffective pain relief measures	<p>Client will verbalize decreased pain</p> <p>Client will utilize noninvasive pain relief measures</p> <p>Client will participate in activities of daily living at a level greater than before use of spinal analgesia</p>	<p>Monitor effects of epidural analgesia by periodic evaluation of daily diary card</p> <p>Teach use of relaxation techniques, distraction, and guided imagery as adjunct to pharmacotherapeutic pain relief methods</p> <p>Determine the client's and caregiver's perceptions of effectiveness of epidural analgesia</p> <p>Use diary card to rate level of pain and activity</p> <p>Incorporate factors that precipitate pain and individual techniques in pain reduction into the plan of care.</p>
Potential for infection related to catheter placement and contamination with microorganisms during dressing changes and installation of analgesic	<p>Client will remain free of local or systemic infection as evidenced by normal temperature and pulse, absence of redness, tenderness, swelling, local fever or drainage at the catheter insertion site</p> <p>Caregiver uses aseptic technique during dressing changes and installation of medication</p>	<p>Monitor client's vital signs from daily diary card</p> <p>Instruct primary caregiver to inspect catheter insertion site during dressing change for evidence of infection and to report presence</p> <p>Change dressing every 48 hours or as prescribed</p> <p>Assess caregiver's ability to perform dressing changes and installation of medication using aseptic technique. (Independence with care is given as caregiver demonstrates ability)</p>
Knowledge deficit related to administration of epidural analgesic	<p>Client will reach therapeutic pain management with the use of intraspinal narcotics</p> <p>Caregiver will provide safe, aseptic maintenance of epidural catheter in the home</p>	<p>Assess client and caregiver's interest and ability to participate in the administration of epidural medications</p> <p>Provide instructions related to drug actions and adverse effects</p> <p>Teach steps to administer narcotic:</p> <ol style="list-style-type: none"> <li>1. Collect equipment—syringes, filter needle, 23 gauge 1-in. needles, alcohol swabs</li> <li>2. Prepare equipment properly</li> <li>3. Check and record respirations</li> <li>4. Wash hands prior to administration of medication</li> <li>5. Check medication for correct drug and dosage</li> <li>6. Lower catheter below head level and observe for blood or fluid return. If noted, STOP and call for home health care nurse</li> <li>7. Aspirate medication from ampule into syringe with filter needle</li> <li>8. Cleanse catheter cap with alcohol and allow to dry. Using a new syringe, attempt to aspirate from port. If 1-2 ml of clear fluid or blood is drawn into the syringe, DO NOT administer medication. Notify the home health care nurse. If 1-2 ml of clear fluid or blood is NOT aspirated, continue with the procedure</li> </ol>

**Table 1. Care Plan for an Epidural Catheter (continued)**

NURSING DIAGNOSIS	EXPECTED OUTCOMES	NURSING INTERVENTIONS
Knowledge deficit related to care of the insertion and exit sites	Client/caregiver states purpose and care of the epidural catheter Epidural catheter is maintained under safe, aseptic standards Client/caregiver indicates interest in accepting responsibility for care of epidural catheter	9. Cleanse catheter cap with alcohol and allow to dry. Obtain syringe containing medication, use new 23 gauge needle, pull back gently and inject medication SLOWLY over 1-2 minutes 10. Discard all needles and syringes in the contamination box. DO NOT RECAP NEEDLES 11. Observe and record client's respirations 8 hours and 12 hours post dose  Assess client and caregiver's interest and ability to participate in the administration of epidural medications Provide instructions related to pathophysiology and purpose of the device Instruct caregiver in cleaning and redressing catheter insertion site: <ol style="list-style-type: none"> <li>1. Prepare work area and gather supplies—sterile injection port, provodine-iodine swabs, antiseptic ointment, sterile dressing, transparent occlusive dressing, surgical tape</li> <li>*2. Wash hands for one minute with provodine iodine scrub and brush with special attention to nails</li> <li>*3. Remove the abdominal dressing and discard into disposal bag</li> <li>*4. Wash hands</li> <li>*5. Hold catheter in nondominant hand, clean site with provodine iodine swabs starting at catheter exit site and working out the entire length of the catheter</li> <li>*6. Apply antiseptic ointment to exit site</li> <li>*7. Apply transparent dressing</li> <li>*8. Wash hands with provodine-iodine scrub</li> <li>*9. Remove transparent dressing, examine catheter insertion site. Discard dressing into disposal bag</li> <li>10. Wash hands</li> <li>11. Clean the insertion site with betadine swab sticks, starting at the catheter, moving out in a circular motion</li> <li>12. Apply antiseptic ointment to the catheter site</li> <li>13. Apply tincture of benzoin, starting ½-in. from catheter site</li> <li>14. Apply transparent dressing</li> <li>15. Document on diary card</li> </ol>
Knowledge deficit related to cap care and change	Cap change will be performed every 48 hours or as prescribed or needed Cap change will be performed under safe, aseptic standards	Prepare equipment—provodine-iodine swab, sterile catheter cap Wash hands with provodine-iodine scrub Cleanse area where injection cap and tubing connect with provodine-iodine Open the package with the new cap and place it nearby Twist the old cap counterclockwise to disconnect and discard. Hold the open end of the catheter without touching it to anything as this end is sterile Take the new sterile cap, remove the protector, and twist clockwise onto the catheter. Use care not to touch the connection between the catheter and the cap. Make sure the cap is on tight

\*Steps 2-9 will be omitted with the direct route of catheter insertion  
 Adapted from Young,<sup>14</sup> with permission.

In addition to assessment of the rate and quality of respirations, the caregiver must be instructed in what action to take if respiratory depression should occur. In many instances, patient stimulation and encouragement to take deeper breaths may be an adequate intervention.

The caregiver must also be instructed in the administration of narcotic antagonists when reversal of respiratory depression is imperative. Naloxone HCl or metoclopramide should be readily available for the patient. The caregiver should be taught when and how to administer a narcotic antagonist, whom to notify in an emergency, and how to perform cardiopulmonary resuscitation.

**Pruritis.** Intense itching of the face, palate, and upper torso can occur and is probably caused by histamine release from systemic effects of the opiate. Pruritis is not a problem for all clients receiving epidural opiates, but occurs more frequently in individuals who are on steroid therapy.<sup>12</sup>

Explaining the causes of pruritis and advising against scratching are important teaching aspects in the nurse's total plan of care. It must be emphasized that clients receiving epidural analgesia are debilitated from their underlying disease and are frequently highly susceptible to infection. Therefore, every effort must be made to ensure meticulous hygiene and intactness of the skin.

EPIDURAL ANALGESIA DIARY									
From _____					To _____				
Client's Name _____									
Physician _____					Telephone Number _____				
Home Health Care Nurse _____					Telephone Number _____				
<p><b>Purpose:</b> The purpose of this card is to keep a complete record of care of the epidural catheter, use of medication and response to this method of pain relief.</p> <p><b>Instructions:</b> Fill in the spaces as you care for the catheter or administer medication. Write in a score for describing pain and activity levels. If you have additional comments to make, write them in the space provided or on the back of this card. Your home health care nurse will assist you with planning.</p>									
Day	S	M	T	W	Th	F	S	S	S
	Time	Time	Time	Time	Time	Time	Time	Time	Time
1. Blood Pressure									
Pulse									
Respiratory Rate									
Temperature									
2. Pain level No pain . . . . . 0 Mild pain . . . . . 1 Moderate pain . . . 2 Severe pain . . . . 3	Morning								
	Afternoon								
	Evening								
	Night								
3. Activity level Very decreased. . . 0 Sl. decreased . . . 1 Normal. . . . . 2 Increased . . . . . 3	Morning								
	Afternoon								
	Evening								
	Night								
4. Epidural injection Drug _____	Time								
	Amount								
	Time								
	Amount								
5. Other Analgesia Drug _____	Time								
	Amount								
	Time								
	Amount								
	Time								
6. Care of Epidural catheter (Check if completed)	Dressing changed								
	Injection cap changed								
7. Appearance of site None noted. . . . . 0 Quality present . . . +	Redness								
	Swelling								
	Drainage								
	Tenderness								
Comments: _____									

Figure 2. A diary card for documenting care of patient on an epidural analgesia regimen at home.

Cool, moist compresses or applications of cornstarch provide temporary relief from itching. Keeping the skin lubricated with lotions helps preserve elasticity and prevents additional itching from dryness. Instructing the family to maintain a cool environment will also benefit the patient, as heat often enhances pruritis. The administration of antihistamines occasionally relieves the symptoms. Administration of low doses of a narcotic antagonist (naloxone or nalbuphine) may help.<sup>13</sup>

**Urinary retention.** Direct action of the opiate on the spinal cord may cause bladder dysfunction. This symptom is seen more often in men than in women. About 10% to 15% of persons receiving spinal analgesia require catheterization while spinal cord routes for pain relief are used).

In addition to assessing for bladder discomfort and distention, the home health nurse should consult the client and caregiver for indications of urine overflow. If the client or caregiver reports frequent dribbling, voiding in frequent small amounts, or urinary incontinence, the amount of residual urine should be checked.

Although an indwelling urinary catheter may be indicated for urinary retention, bethanechol may be helpful in abating this symptom. It is important to alert the client and family to urinary retention as a potential problem and to encourage measures before bladder distention occurs, since a distended bladder decreases muscle tone and further complicates the problem.

**Gastrointestinal symptoms.** Although rare, nausea and vomiting and constipation can occur with administration of epidural morphine. Nausea and vomiting from systemic opiates is usually abated by anti-emetics.

Constipation may require an increase in the patient's fiber content to add bulk and moisture to the stool and speed movement through the bowel. The increase of fluids to 2 L/ d is desirable, but often problematic for the chronically ill patient. For some, the ingestion of hot liquids in the morning is helpful. Daily exercise, within the limits of the patient's stamina, aids in the relief of constipation.

Medications that may be of benefit include psyllium and other bulk-forming laxatives. Encouraging more roughage and fluids in the diet may also be helpful. Patients and care-givers need to know that improvement in bowel function may take several weeks to occur.

**Infection.** Local infection and meningitis occur primarily because of poor technique in caring for the catheter and administering the drug. Careful evaluation of technique and correction of errors are critical to prevent this complication when using the epidural route for analgesia. Early observations include redness, warmth, discomfort, and exudate at the insertion site. Fever, headache, nuchal rigidity, irritability, and changes in level of consciousness are signs of meningitis and should be reported immediately.

**Tolerance.** It is expected that tolerance to epidural morphine administered twice daily may develop after 14 to 30 days and that dosages will gradually be increased to maintain comfort. It has been noted that once patients begin to require injections as frequently as every 8 hours, the analgesic rapidly loses effectiveness.<sup>12</sup> The sudden development of tolerance should cause the nurse to suspect that the catheter has slipped from the epidural space to subcutaneous tissue.

**Self-concept.** The presence of an epidural catheter and the changes in the patient's plan of care may stimulate some alterations in self-concept. The patient needs to be encouraged to ask questions about the disease process, pain management, and treatment plan. Participation in self-care enhances a sense of self-control and allows for success in more activities.

Questions that may assist the nurse in evaluating self-concept<sup>14</sup> include:

- How does the patient feel about his or her body?
- How does the patient consider his or her importance as a person?

- What roles does the patient play in the family?
- Which of these roles are most important to the patient?
- How does the patient see himself or herself as filling those roles?
- What does he or she see as areas of strength and problem areas?

## SUMMARY

The administration of epidural morphine is a relatively new and promising method of controlling pain in selected persons. Although quality of life improves with this approach, there are a number of risks involved. The home health nurse plays a vital role in assuring success of the epidural analgesia regimen through client teaching, monitoring care of the catheter, and monitoring the client's response to the medication. It must be stressed that although this type of narcotic delivery system is a useful adjunct to pain management, comfort measures and noninvasive pain relief measures continue to be an essential aspect of pain management.

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