Management of Chronic Pain

Case Study

D.P., a 49-year-old woman, was diagnosed with metastatic renal cell carcinoma of the left kidney about a year and a half prior to this visit to the Symptom Management Clinic. She had just completed a course of radiation to the sternum for bony metastasis during which time she also was seen regularly by the palliative care interdisciplinary team. She complains of severe abdominal pain for the past two days without nausea, constipation, fever, or chills. On examination, her blood pressure is 107/60, her pulse is 97 beats per minute regular, and her respiratory rate is 20 breaths per minute. Her abdomen is mildly distended and diffusely tender. She is admitted to the hospital for further evaluation of an acute abdomen, probably secondary to metastatic disease.

Etiology

At initial diagnosis, D.P.’s cancer was metastatic. Her chronic pain had been well controlled prior to this admission. In the past, the lack of pain control heralded new disease sites. Palliative care and effective symptom management are critical for her quality of life, pain often being her number one complaint. As pain expert Margo McCaffery expressed, “Pain is whatever the experiencing person says it is and existing whenever he says it does,” (Mann & Carr, 2006, pp. 1–2).

Chronic pain is defined primarily by duration, persisting for weeks, months, or years. Although the neurophysiology associated with it continues to be studied, the term neuromatrix is used to describe the complexity of chronic pain and characterizes chronic pain as

- Subjective and unique to each individual.
- Generated from within the brain and involving many central regions of the brain. Thus, the brain may produce the pain experience rather than it arising from the periphery as in acute pain.
- Influenced by past pain experiences (Mann & Carr, 2006).

In 2001, the Pain Management Standards became part of the survey and accreditation process of the Joint Commission on Accreditation of Healthcare Organizations (Joint Commission, 2004). Even so, significant barriers to effective pain management remain. Although not an exhaustive list, the barriers include lack of pain assessment, particularly when chronic pain is rarely accompanied by signs of sympathetic nervous system stimulation such as tachycardia, diaphoresis, or pallor; fear of opioids and addiction; fear of delayed recovery because of overuse of analgesics; and religious and cultural prejudices against pain relief and bias toward the rewards of suffering (American Pain Society, 2003, 2007; Paice & Fine, 2005; Hospice and Palliative Nurses Association, 2003; American Nurses Association, 2007; Oncology Nursing Society, 2006).

Assessment

D.P. was hospitalized for three days. Imaging procedures during admission revealed the following findings: Bone scan showed evidence of further metastatic disease in the pelvis, new right rib lesions, unchanged sterna, and xiphoid process metastases; flat plate of the abdomen showed no obstruction; computed tomography scan of the abdomen and pelvis revealed disease progression intra-abdominally with bony lytic destruction evident in the left ileum, sacrum, and pelvis. Her prescribed analgesia regimen included morphine sulfate sustained release (MSSR) 100 mg by mouth every eight hours (her same dose as at home), morphine sulfate 5 mg IV every 1–2 hours as needed for breakthrough pain, and ibuprofen 1,000 mg by mouth twice a day.

Pain Management

It is important to examine D.P.’s pharmacologic and nonpharmacologic interventions for pain control. D.P.’s need for breakthrough medication averaged 40 mg over 24 hours of morphine sulfate IV. Breakthrough pain may be incident pain that can be anticipated, spontaneous pain that is unpredictable, or end-of-dose failure pain that occurs when around-the-clock (ATC) medication blood levels have declined to a nontherapeutic level before the next scheduled dose (Paice & Fine, 2005). D.P.’s pain could be anticipated with increased activity. Her past experience with pain is the best gauge to adjust and titrate the breakthrough medication to maintain pain control.

On assessment, when she previously complained that the MSSR “helped her pain but does not last until the next dose,” it indicated that the right drug was prescribed but that the interval was too long. If a patient complains that the analgesic drug “helps a little but not enough,” it may indicate that a higher dose is needed.

Patricia Beach, MSN, RN, AOCN®, is a clinical nurse specialist at St. Vincent Mercy Medical Center in Toledo, OH.

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For control of chronic cancer pain, opioids are particularly helpful because the single drug preparations do not have a ceiling dose. If a patient complains that the analgesic drug “does not help at all,” a different medication is indicated.

Equianalgesia is the concept of comparing the analgesic potency of pain medications based on drug and route of administration. Its clinical utility allows for an educated approach when determining needed changes in opioids. See Table 1 for a list of common equianalgesic conversions.

Once D.P. achieved pain relief for 24 hours, conversions were made for sustained- and immediate-release preparations that could be used at home. Based on the equianalgesic conversions, principles listed in Figure 1, D.P.’s pain regimen was modified.

Sustained-release preparations should always be ordered around-the-clock, never as needed, and they should never be crushed or cut. For D.P., the every-eight-hour dosing worked well. The sustained-release opioid gave her constant control of pain.

Gabapentin 600 mg by mouth three times a day was prescribed as an adjuvant analgesic medication. Although the analgesic action of this anticonvulsant is not well understood, ample clinical experience and evidence from clinical trials maintain that it is effective, particularly in neuropathic pain (Wiffen, McQuay, Edwards, & Moore, 2005). Gabapentin may be started at 100 mg by mouth three times a day and adjusted daily to a maximum daily dose of 1,800 mg by mouth three times a day. A common reason for failure is inadequate upward titration of the dose. Analgesic doses reported to relieve pain range from 900–3,600 mg per day in divided doses with minimal side effects (Paice & Fine, 2005).

Metastatic bone pain was a great source of distress for D.P. Nonsteroidal anti-inflammatory drugs (NSAIDs) work to decrease prostaglandin synthesis and inhibit inflammation, both factors in metastatic bone pain. Ibuprofen, an NSAID, was increased to 800 mg by mouth three times a day and continued as part of D.P.’s pain control regimen throughout the course of her illness.

From the start of opioid therapy, a bowel regimen must be prescribed to prevent constipation. To prevent constipation, polyethylene glycol 17 gm by mouth daily was prescribed. Polyethylene glycol is an osmotic agent that causes water to be retained in the stool and worked well for D.P. Tolerance to this side effect does not occur with continued opioid use (Furlan, Sandoval, Mailis-Gagnon, & Tunks, 2006).

Nonpharmacologic interventions for pain management also were incorporated into D.P.’s plan of care. Interventions included massage therapy, relaxation therapy, prayer, and counseling. D.P. said that it was very helpful to be able to discuss her anger and anxiety about having a terminal disease at a relatively young age and the distress she felt about not seeing her grandchild grow older. She

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### Table 1. Opioid Comparisons

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>EQUIANALGESIC DOSES (MG)</th>
<th>PHARMACOKINETIC PROFILE (ORAL FORMULATIONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IV/SC</td>
<td>PO</td>
</tr>
<tr>
<td>Morphine sulfate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IR</td>
<td>10.0</td>
<td>30.0</td>
</tr>
<tr>
<td>CR</td>
<td>–</td>
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<tr>
<td>MR</td>
<td>–</td>
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</tr>
<tr>
<td>Codeine</td>
<td>120.0</td>
<td>200.0</td>
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<tr>
<td>Hydromorphone</td>
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<tr>
<td>Oxycodone</td>
<td>–</td>
<td>20.0</td>
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<tr>
<td>CR</td>
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<td>–</td>
</tr>
<tr>
<td>Oxymorphone</td>
<td>1.0</td>
<td>10.0</td>
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<tr>
<td>IR</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>ER</td>
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</tbody>
</table>

**MEDICATION**

**EQUIANALGESIC DOSES (MG)**

**PHARMACOKINETIC PROFILE (ORAL FORMULATIONS)**

**ONSET**

**DURATION**

**Fentanyl**

- 180 mg oral morphine per 24 h = 100 mcg transdermal fentanyl
- 1 mg IV morphine = 10 mcg transdermal fentanyl

**Conversion ratios:**
- Oral: IV = 2:1
- Oral morphine: Methadone is based on 24-h morphine total.

**Methadone**

- Interindividual variability exists; methadone should be used by experienced clinicians only.
- Doses may need to be decreased after several days of administration; monitor vital signs daily and consult a specialist.
- May cause QT interval prolongation at higher doses

**CR**—controlled release; **ER**—extended release; **h**—hour; **IR**—immediate release; **IV/SC**—intravenously or subcutaneously; **min**—minute; **MR**—modified release; **PO**—by mouth; **PR**—via the rectum; **TD**—transdermal

**a** Always individualize therapy based on patient-specific characteristics.

**b** May need to decrease doses in presence of renal insufficiency

**c** Medications formulated to be long acting are given on a regular schedule, not on an “as-needed” schedule.

**d** Administer at least one hour before or two hours after a meal.

**e** Often used in patients with renal insufficiency because of less accumulation of active metabolites.

frequently mentioned her anguish that her grandchild was seeing her with the physical changes caused by her illness and treatment. Those issues were mostly resolved in discussions with members of the palliative care team; family visits contributed to her enjoyment. Her discharge care plan included referral to home hospice with her mother continuing as her primary caregiver.

**Conclusion**

The most effective approach to the complex treatment of pain is one that combines pharmacologic and nonpharmacologic treatments. As seen in D.P.’s case, NSAIDs are useful for many pain states, especially those involving inflammation. Analgesics should be given on a regular schedule if pain is present most of the day, with as-needed dosing for breakthrough pain. When available and effective, oral administration is preferred. The preferential parenteral routes are IV and subcutaneous administration. The intramuscular route is painful, has wide fluctuations in absorption, has a 30- to 60-minute lag time to peak effect, has rapid falloff of action, and should be abandoned.

Give analgesics on a regular schedule if pain is present most of the day, using as-needed dosing for breakthrough pain. Optimal pain medication doses vary widely. Single preparation opioids do not have a ceiling dose. Nurses should recognize and treat side effects, including preventing constipation. Gabapentin may be an effective pharmacologic adjunct. Classes of drugs that may be beneficial include NSAIDs with inflammation, tricyclic antidepressants, antiepileptics, local anesthetics, glucocorticoids, skeletal muscle relaxants, antispasmodic agents, antihistamines, benzodiazepines, caffeine, topical agents, dextroamphetamine, and phenothiazines. Nurses must assess and reassess patients for pain control, implementing plans of care that include pharmacologic and nonpharmacologic interventions, to ensure successful pain management and a high quality of life for patients.

**Author Contact:** Patricia Beach, MSN, RN, AOCN®, can be reached at pbeach@buckeye -express.com, with copy to editor at CJON Editor@ons.org.

**References**


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**Figure 1. Equianalgesic Conversions and Principles That Guided D.P.’s Pain Regimen**

- Convert the IV breakthrough medication needed in 24 hours to the oral equianalgesic dose. Because a parenteral dose of 10 mg is equivalent to 30 mg by mouth, D.P.’s 40 mg parenteral morphine is equivalent to 120 mg of morphine by mouth.
- Calculate the total pain medication needed in 24 hours, around-the-clock, and as-needed doses. Because 300 mg of morphine sulfate sustained release (MSSR) in conjunction with 120 mg of morphine sulfate IV conversion is equivalent to 420 mg of morphine by mouth, D.P. requires 420 mg of morphine over 24 hours.
- Divide that dose over 24 hours for sustained-release preparation. D.P. received dosing every eight hours, with a larger dose at bedtime to help her sleep longer. Therefore, D.P. received 120 mg MSSR in the morning, 120 mg MSSR in the afternoon, and 180 mg MSSR at bedtime.
- Use 10%–20% of a 24-hour, sustained-release dose for breakthrough dosing, using same drug when possible. D.P. received 40 mg morphine sulfate immediate release by mouth every 1–2 hours as needed.

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