

# PAIN MANAGEMENT

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## OBJECTIVES

1. Describe the complex nature of pain, focusing on the aspects of pain perception in children.
2. Understand the best ways to assess pain by using self-report, behavioral observation, and physiologic measures.
3. Describe the pain syndromes unique to patients with human immunodeficiency virus (HIV)/AIDS and specific measures useful to alleviate pain.
4. Understand how to use the World Health Organization (WHO) Pain Ladder to initiate and titrate pain medications.
5. Understand key facts about the most common analgesics used in pain control.
6. Describe symptom management at the end-of-life stage in individuals with HIV/AIDS, including dyspnea, diarrhea, constipation, nausea/vomiting, anorexia, peripheral edema, and intractable hiccups.

## KEY POINTS

1. Pain is a complex process involving both physiologic and nonphysiologic factors unique to each individual.
2. Pain in persons with HIV/AIDS is common and often undertreated.
3. Self-report is the best way to assess pain, but there are other ways to elicit pain cues from patients.
4. Pain relief should begin with a straightforward, developmentally appropriate explanation to the patient about the causes of pain.
5. Specific analgesic measures can help with pain localized to certain areas.
6. Pain management for people with HIV/AIDS should follow the WHO analgesic ladder when possible and should include behavioral interventions.
7. Symptom management at the end-of-life stage is complex and requires ongoing assessment and intervention.

## "I'M IN PAIN": THE COMPLEX NATURE OF PAIN

As human immunodeficiency virus (HIV) alters the immune system of an infected individual, the number of infections and malignancies increases. These sequelae of immune suppression have a frequent common symptom of pain.

Pain is a sensation produced when a stimulated nerve signals the brain that something is wrong. The brain relays this sensation to other areas of the nervous system, setting off a cascade of responses, thoughts, and emotions.

Children with HIV/AIDS experience pain throughout their disease. The incidence of pain in HIV-infected children is comparable to that in childhood cancer. In one study, pain affected almost two-thirds of HIV-infected children in their daily lives, though only one-third received appropriate analgesia.

Pain is particularly underrecognized and undertreated in the pediatric population because children rely on adult caregivers to recognize and respond to their pain. The myth among caregivers that children do not feel pain the same way that adults do is a barrier to their treatment.

Children underreport pain because they fear

- talking to health care providers,
- disappointing others,
- receiving an injection, and
- returning to the hospital.

Failure of health care providers to account for the developmental level of a child as they assess pain can lead to a critical undertreatment of pain among infants, children, and adolescents throughout the world.

Pain is inherently subjective. Many factors beyond the physical experience of pain affect how pain is perceived (Figure 1). Adequately addressing chronic pain in HIV/AIDS requires astute attention to all these factors.

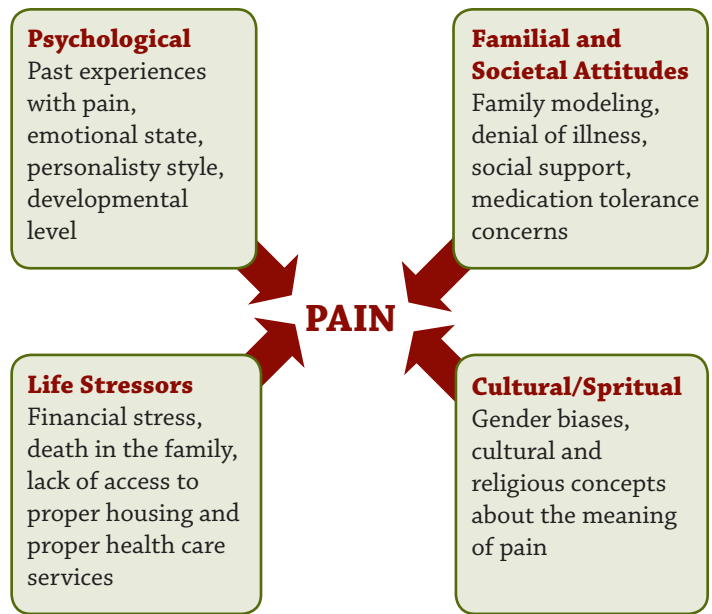
**Psychological Factors**

Pain control can modulate a child’s future response to pain. Newborns circumcised without analgesia showed more distress during later routine immunizations than uncircumcised infants or those circumcised with local anesthesia. Also, pediatric cancer patients given inadequate analgesia during an invasive procedure showed more severe distress during later procedures than those who received a potent opioid during the first procedure.

Emotional states such as depression also play a key role in the experience of pain. Sometimes the fear of pain, injury, or loss of physical ability may be more disabling than the pain itself. People dealing with chronic illness often experience feelings of depression and helplessness. Because approximately half of depressed patients express pain as a symptom of their illness, pain control must address the accompanying symptoms of depression and anxiety.

A child’s temperament and personality type also affect how pain is perceived. Children considered to have a more “difficult” temperament (e.g., negative mood, poorly adaptable, complaining) are more likely to display distress during a painful experience than children with “easy” personalities (e.g., adaptable, positive). This latter group of children may not receive appropriate analgesia because they might not report their pain to the same degree. Children with naturally good coping mechanisms such as information seeking or focusing attention away from the painful stimuli can better handle pain. Those who accept their illness as a challenge to overcome usually fare better than those who do not accept their illness or who see their illness as a sign that they are “damaged.”

When helping children deal with pain, health care providers should also keep in mind a child’s developmental level. Children at different ages perceive pain in different ways (Table 1). For example, a preschooler may not understand or gain comfort from a cause-and-effect explanation for a painful procedure (e.g., “This lumbar puncture will help us treat your infection and in the end you will feel better”), whereas this information would probably comfort a school-aged child.



**Figure 1. Nonphysiologic factor contributing to pain**

**Familial and Social Attitudes**

The attitudes of family and society regarding the child’s illness and pain in general contribute significantly to a child’s perception of and reaction to pain. Parents and caregivers can model both positive and negative ways to tolerate and express pain. Caregivers can listen, comfort, and counsel children on dealing with pain appropriately, but caregivers can also inadvertently encourage children to stay in the “sick role” even if no longer necessary. If family members are in denial regarding the patient’s disease, the patient may feel emotionally isolated, depressed, or anxious; these feelings compound the physiologic pain. Parental denial of HIV status has also been linked to denial of the child’s pain.

**Table 1. Age and concept of pain**

Age (yrs)	Concept of Pain
2–6	Pain as physical, concrete or magical; may see pain as punishment for wrongdoing on their part or the part of a loved one
7–12	Some pain as psychological (e.g., grief), beginning cause–effect thinking, may fear bodily harm and death
≥13	Can verbalize reasons for pain and perceive several types of psychological pain but have limited abilities to cope

### Life Stressors

Children who have experienced a death in the family, particularly the death of a parent, are at risk to have more acute experiences of pain. Orphaned children are especially vulnerable to poor pain control. Parents are much better predictors of actual pain in children than health care providers; therefore, losing a parent takes away a child’s most important advocate for pain management. A family overwhelmed by financial stress, unemployment, a housing crisis, or other major life stressors may not have the resources to properly attend to the pain of a child in their midst.

### Cultural and Spiritual Factors

A patient’s sex plays a role in how pain is experienced and expressed. Females tend to be more vocal about pain, whereas males may feel that they need to be “tough” and therefore see themselves as not free to ask for pain relief. Some cultures conceive of pain as punishment for wrongdoing, and children can incorporate and embody these same ideas. In HIV/AIDS, for which stigma still has a role in many societies, children may fear to speak up about pain from their disease in an effort to not draw attention to their disease. Health care providers should be attuned to the spiritual needs of their patients in their efforts to holistically address pain. Children may gain comfort from spiritual concepts of prayer and suffering.

## “HOW BAD IS MY PAIN?”: PAIN ASSESSMENT

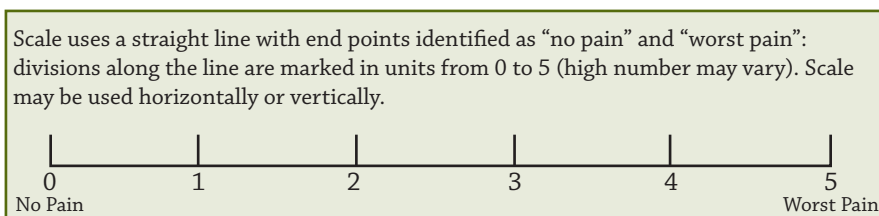
Several validated pain assessment tools exist to aid the clinician, but usually a combination of self-report, behavioral observation, and physiologic measures can work together to provide a comprehensive appraisal. Self-report is the “gold standard” of pain assessment, but this is obviously challenging in infants, nonverbal children, and children too critically ill to communicate verbally. In these situations, a therapeutic trial of comfort measures and analgesic medications may be helpful in interpreting distressed behavior. A health care provider should assess and document pain at regular intervals—with each new report of pain, as well as after a pharmacologic or nonpharmacologic intervention has been provided to offer the best possible pain management.

### Self-Report

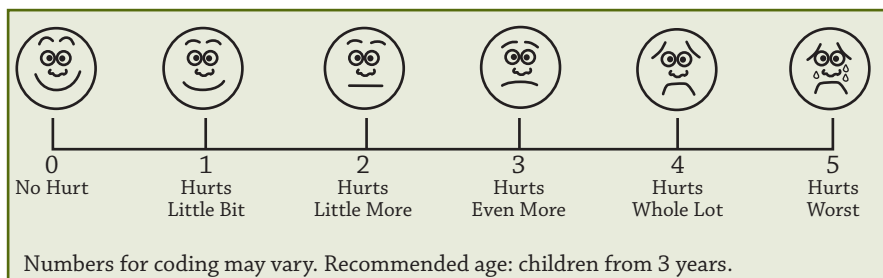
If a child is of sufficient age and developmental level, eliciting a full qualitative description of his or her pain is helpful. A pain history includes the following:

- Character (e.g., burning, dull, sharp)
- Location (including any radiation)
- Quality
- Duration
- Frequency
- Intensity

Beneficial direct dialogue with children includes topics such as how they have positively dealt with pain in the past, with whom they feel most comfortable discussing pain, and interventions that have helped and not helped in previously



**Figure 2. Numeric pain scale**

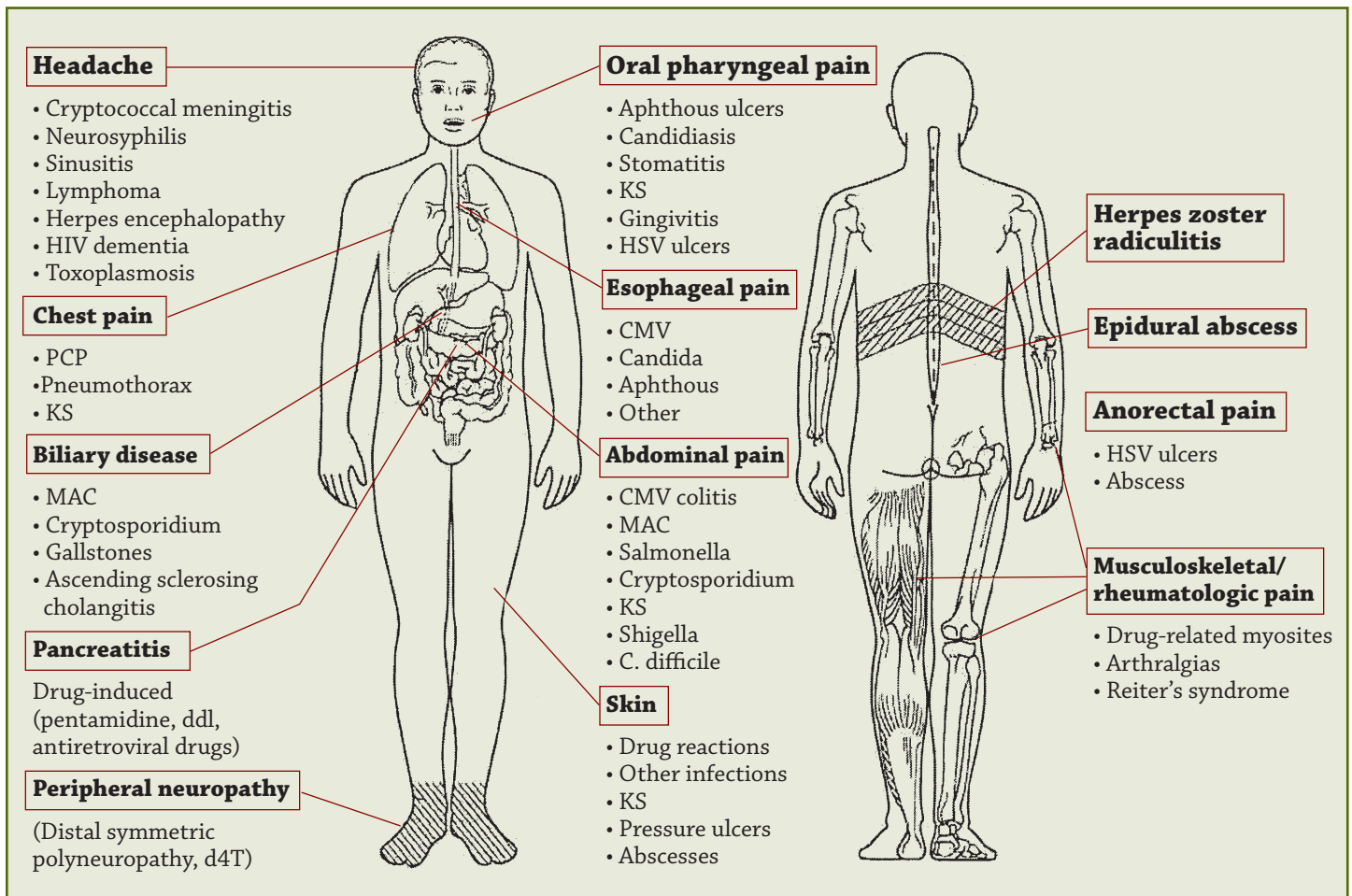


**Figure 3. Faces pain scale**

painful situations. Considering caregivers’ observations about their child’s past pain experience can also be helpful in making a plan to deal with the current pain.

Children aged 8 or more years can generally use a simple linear scale (**Figure 2**) to rate the intensity of their pain, giving a quantitative measure to pain.

One can assess a child’s ability to use a linear pain scale by putting the child through a simple test such as placing five bits of paper of different sizes in order from smallest to largest. This linear scale helps patients describe their pain better and can provide important information about whether pain management techniques are effective. For children aged 3–8 years, self-reported measures usually incorporate the faces scale to assess children’s perceptions of pain (**Figure 3**).



**Figure 4. Sources and locations of pain in HIV-infected persons.** From McCaffery M, Pasero C: *Pain Clinical Manual*, St. Louis: Mosby, 1999. Used with permission.

Children as young as 18 months can usually report pain or hurting in some fashion but have difficulty understanding gradation of pain (e.g., a little, a lot).

### **Behavioral Observation**

Behavioral observation is the primary means of assessing pain in newborns, infants, children younger than 4 years, and children with developmental disabilities. Observations include facial expressions, limb and trunk motor responses, vocalizations (e.g., crying, moaning), body posture, activity, and appearance. These measures are imperfect; they cannot distinguish between forms of distress (e.g., pain versus fear or anxiety) and they underestimate pain relative to self-report. Children with chronic inadequately treated pain may use distraction techniques such as playing, sleeping, or remaining quiet to deal with pain, and these behaviors can mislead clinicians into thinking that the pain is under control. Behaviors to express pain can also vary; some infants might close their eyes, furrow their brows, or clench their fists rather than cry in pain. Caregivers most familiar

with the child are often the best individuals to interpret behavioral cues.

### **Physiologic Measures**

Pain leads to stress within the body that activates compensatory mechanisms of the autonomic nervous system. Responses include tachycardia (fast heart rate), elevated blood pressure, tachypnea (rapid breathing), restlessness, and dilation of the pupils. As with behavioral measures of pain, physiologic measures cannot discriminate well between a physical response to pain and other forms of stress on the body. As with the assessment of any symptom, a complete physical examination can yield much information in the attempt to link the pain complaint with the patient's disease and find the best means to alleviate the cause of the pain.

### **"WHAT IS CAUSING MY PAIN?"**

HIV opens the body to attacks from infections and malignancies with a frequent common symptom of pain.

The etiology of pain with HIV is usually multifactorial but can often be attributed to opportunistic infections, side effects of medication, and nonspecific factors related to the HIV infection itself. The cause of pain can be elusive but must be pursued to eradicate the underlying cause, choose the best analgesia, and provide prognostic counseling.

A patient with HIV can sprain an ankle or develop a headache like anyone else, requiring similar acute pain treatments. This chapter will focus on pain syndromes exclusive to or more common with HIV organized by anatomical location and a cluster of symptoms occurring late in AIDS. **Figure 4** provides a useful tool for differential diagnosis of pain.

## “WHAT CAN BE DONE ABOUT MY PAIN?”

Many measures have been used with great success in pain relief for HIV-infected individuals. A working knowledge of the usual sources of pain in HIV and an understanding of some key principles in the proper use of analgesics are essential. Understanding various nonpharmacologic measures that help relieve pain is especially important in treating pain in children.

### **Specific Pain Syndromes by Anatomical Location**

**Mouth.** Topical agents can relieve pain from oral manifestations such as candidiasis and aphthous ulcers. Magic Mouthwash (a preparation of a 1:1:1 solution of diphenhydramine elixir [12.5 mg/5 mL], an antacid, and viscous lidocaine) swished and spit out helps reduce pain in severe thrush, as can glycothymol mouthwash. Some clinicians have found that 1% gentian violet topically applied to aphthous ulcers can provide relief.

**Esophagus and chest.** Chest pain from either esophagitis or pleural inflammation from pneumonia often responds favorably to opioid analgesic agents. Cough medications containing codeine contribute to cough suppression and alleviate pleuritic pain. Viscous lidocaine taken by mouth is useful in mitigating pain for esophageal ulcers caused by *Candida* and herpesvirus.

**Skin itching (pruritus).** Severe itching commonly affects debilitated HIV/AIDS patients who suffer from chronic skin conditions, side effects of medications (e.g., opioids), and other systemic diseases.

Though symptomatic treatment for itching is readily available, identification and treatment of the underlying cause will achieve the best relief. Severe itching commonly results from skin conditions such as papular pruritic eruptions, scabies, fungal infections, and poorly cared for dry skin. Pruritus can be a manifestation of systemic diseases also common with HIV/AIDS, such as hepatitis, biliary disease, lymphoma, and renal failure. The provider should search for the systemic causes while starting routine antipruritic therapies.

Treatments for pruritus include the following:

- Skin moisturizers and emollients help to relieve the itching that commonly occurs from dry skin. Petroleum jelly is a readily available agent that is effective when applied two to three times daily. Using tepid water minimizes the drying effect of bathing.
- Oral antihistamines play a key role in reducing itching, which often results from histamine release in the skin. Diphenhydramine and hydroxyzine are useful, though they often cause mild sedation and dry mouth. Doxepin, a tricyclic antidepressant possessing antihistamine properties, is also effective for refractory cases.
- Keeping nails short and clean minimizes infection in scratched areas.
- Calamine lotion and menthol are mildly effective. Oatmeal baths are useful, and occasionally topical steroids, such as 1% hydrocortisone, are required.

**Neuropathic pain.** Neurologic complications such as herpes zoster radiculitis, peripheral neuropathy (either from HIV itself or from antiretroviral agents), and HIV encephalopathy often cause a unique kind of pain called neuropathic pain. Neuropathic pain is caused by an abnormal excitability in the peripheral or central nervous system that patients often describe as a burning or stabbing sensation. Neuropathic pain is notoriously unresponsive to nonsteroidal anti-inflammatory drugs (NSAIDs) and to opioid analgesics, and therefore adjunctive agents such as antidepressants (e.g., tricyclic antidepressants) and anticonvulsants have been effectively used.

### **General Principles of Pain Management**

Pain results not only from a physical sensation but also from many contributing psychosocial factors. The treatment of pain, therefore, should include medicinal and nonmedicinal stratagems.

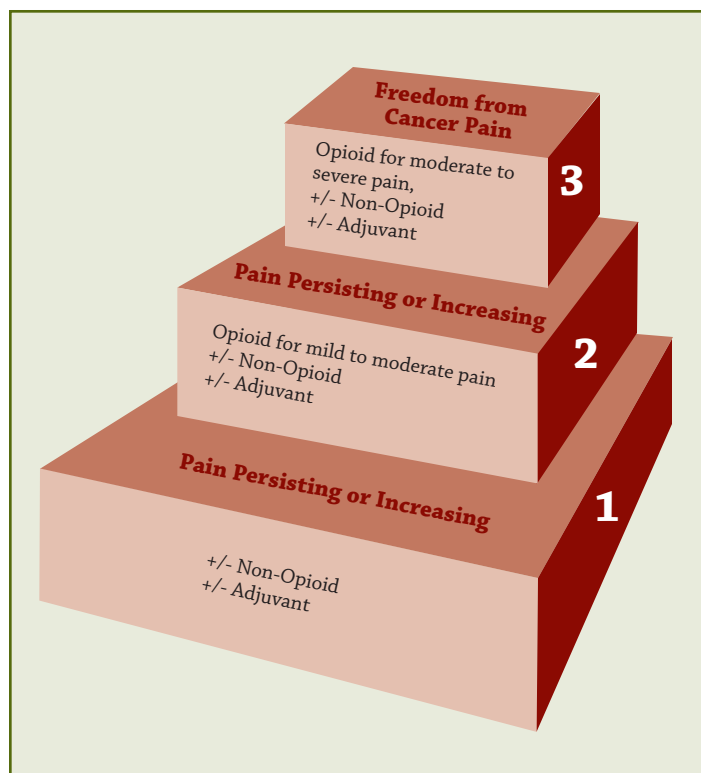
When choosing a medicinal strategy, remember to proceed as the World Health Organization describes: 1) by the ladder, 2) by the mouth, and 3) by the clock whenever possible.

**By the ladder.** Figure 5 and Figure 6 are useful guides for starting a patient on analgesics. The key decision here is assessing the severity of the patient's pain.

**By the mouth.** Oral administration is the easiest route for an alert patient. The patient is allowed a role in his or her own care and can feel empowered by this participation.

Intravenous or intramuscular routes of administration are useful for patients in excruciating pain or who are vomiting, but these routes are more difficult to administer, can cause pain themselves, and require more frequent dosing because of more rapid metabolism.

Transdermal administration is effective in patients who cannot take medicines by mouth. There is a delay of 12-24 h until therapeutic levels are reached once a patch is placed, and drug continues to be released for up to 24 h once the patch is removed. The titration of the medicine should occur only at 72-h intervals. A patient's skin must



**Figure 5. WHO Pain Ladder.** From WHO Guidelines (<http://www.who.int/cancer/palliative/painladder/en/>).

also be clean, hairless, and dry. Profuse sweating can impair adhesion and alter absorption rates.

Many analgesic drugs are available as rectal suppositories. This mode of delivery has a role to play in pain control, but absorption of drugs by the rectal route can be inconsistent. Rectal medications should not be used in patients with neutropenia (low white blood cell levels) or thrombocytopenia (low platelet counts) because of the risk of infection and bleeding.

**By the clock.** Administering pain medication on a scheduled basis is the preferred method of achieving analgesia. Scheduled regimens account for the half-lives of the drugs and help to achieve a consistent level of the drug in the bloodstream, providing a consistent analgesic effect.

Clinicians argue that maintaining analgesia takes less medication than attaining it—it takes more medication to make pain go away than to keep pain away once it has been relieved.

With PRN (“as-needed”) regimens, patients may wait until their pain is unbearable before taking a dose and then have to accept the defeat of the pain prior to taking a needed treatment.

PRN dosing is useful in addition to scheduled medication as a breakthrough pain dose. The breakthrough medication is usually a short-acting opiate and should be 10% of the total daily dose of opiates. One can offer this treatment every 4 h, and one can use the number of daily breakthrough doses required to adjust the scheduled doses at the next provider encounter.

### Specifics about Drug Classes

- 1. Ibuprofen or other NSAIDs:** such drugs block the synthesis of specific prostaglandins through inhibiting cyclooxygenase.

These medications are efficacious in relieving mild pain and as an addition to opiates for moderate to severe pain. Chronic scheduled use of these medications (greater than 2-4 weeks) can increase the risk of gastric ulcers. Patients with coexisting HIV-related gastrointestinal symptoms may not tolerate NSAIDs. Also, patients with renal or liver disease should avoid these medications because they

<b>Give only one drug from the opioid and non-opioid group at a time.*</b> *Exception: If no codeine, aspirin every 4 hours can be combined with paracetamol every 4 hours—overlap so one is given every 2 hours.					
	Analgesics	Starting Dose in Adults	Range	Side Effects/ Cautions	Starting Dose in Children
	↓	↓	↓	↓	↓
<b>STEP 1</b>	<b>Non-opioid</b>				
	<b>Paracetamol</b> (also lowers fever)	500 mg 2 tablets every 4-6 hours (skip dose at night or give another analgesic to keep total to 8 tablets).	Only 1 tablet may be required in elderly or very ill or when combined with opioid. Mild pain might be controlled with 6 hour dosing.	Do not exceed eighth 500 mg tablets in 24 hours (more can cause serious liver toxicity).	10-15 mg per kg every 4 hours oral, not to exceed 75 mg/kg/day in infants and 100 mg/kg/day in children
	<b>Aspirin</b> (acetylsalicylic acid) (also anti-inflammatory and lowers fever).	600 mg (2 tablets of 300 mg) every 4 hours.		Avoid use if gastric problems. Stop if epigastric pain, indigestion, black stools petechiae or bleeding. Do not give to children under 12 years. Avoid if presence of any bleeding.	Avoid use if possible
	<b>Ibuprofen</b> (also anti-inflammatory, lowers fever, for bone pain).	400 mg every 6 hours.		Max. 8 tablets per day.	5-10 mg per kg every 6-8 hours, not to exceed 40 mg/kg/day
<b>STEP 2</b>	<b>Opioid for mild to moderate pain</b> (give in addition to aspirin, ibuprofen, or paracetamol)				
	<b>Codeine</b> (if not available, consider alternating aspirin and paracetamol*).	30 mg every 4 hours.	30-60 mg every 4 to 8 hours. Maximum daily dose for pain 180-240 mg due to constipation—switch to morphine.	Give laxative to avoid constipation unless diarrhea.  <b>Cost</b>	0.5-1 mg per kg per dose every 4-6 hours
<b>STEP 3</b>	<b>Opioid for moderate to severe pain</b>				
	<b>Oral Morphine</b> 5 mg/5 ml or 50 mg/5 ml.  Drop into mouth. Can also be given rectally (by syringe).	2.5-5 mg every 4 hours (dose can be increased by 1.5 or doubled after 24 hours if pain persists).	According to need of patient and breathing.  <b>There is NO ceiling dose.</b>	Give laxative to avoid constipation unless diarrhea.	0.2-0.5 mg per kg every 4 hours

**Figure 6. Use of opioids and nonopioid analgesics.** Adapted from WHO Guidelines on Palliative Care.

can precipitate renal failure by their action on the kidneys' glomerular regulation of blood flow.

- 2. Salicylates (aspirin):** Pediatric use of aspirin for pain has declined since the 1970s because of its association with Reye's hepatic encephalopathy. Aspirin does maintain a role, however, in rheumatologic conditions and for inhibiting platelet adhesion.
- 3. Acetaminophen (paracetamol):** Paracetamol has replaced aspirin as the most widely used antipyretic and mild analgesic agent for children throughout the world. It has a good safety profile, often comes in oral and rectal preparations, and is not associated with the gastrointestinal or antiplatelet side effects of aspirin or NSAIDs. Unlike aspirin or NSAIDs, this agent has little anti-inflammatory action.
- 4. Opiates (e.g., codeine, morphine):** Opiates are the backbone of any regimen for moderate to severe pain and are useful for other symptoms encountered near the end of life. Opiates are available in all dosing forms and have been formulated for slow and rapid effects (**Table 2**). These drugs activate special receptors that modulate pain. These opiate receptors are widely distributed throughout the body, explaining the many side effects that can occur with their use.

Side effects that need monitoring during opioid use include constipation, sedation, itching, and nausea and vomiting. Respiratory depression, although greatly feared among health care providers, is rare when opiates are used appropriately. Constipation is a particularly troubling problem, and patients should be started on a stool softener and/or laxative at the initiation of opioid medication.

**Table 2. Equianalgesic dose of various opiates**

Medication	Oral Dose (mg)	IV Dose (mg)
Morphine	30	10
Hydromorphone	7.5	1.5
Oxycodone	20	N/A
Methadone	20 (acute)	10 (acute)
Fentanyl	N/A	0.1
Oxymorphone	10	1

N/A - Not applicable.

### **Nonpharmacologic Interventions**

Although nonpharmacologic approaches to pain management should not be used as an excuse to withhold appropriate analgesics, there are measures that can be taken in the pediatric population to relieve the fear and anxiety that often amplify pain. Age-appropriate comfort measures can include the following:

- Infant-specific comforts (swaddling, carrying, and breast-feeding)
- Massage therapy (stroking, rubbing, or deep manipulation of muscles)
- Distractions (storytelling, playing a game, or listening to music)
- Relaxation techniques (progressive muscle relaxation and controlled-breathing exercises)
- Individual or group psychotherapy

Simply giving information regarding the disease process and medical procedures can help children and their families feel less out of control. Informing them of their pain control options and including children and their caregivers in decision making can go far to help make pain management more effective.

### **SYMPTOMS NEAR THE END OF LIFE**

Certain troubling symptoms can occur near the end of life in patients with HIV/AIDS. Symptom management at the end-of-life stage must address the patient's physical, psychological, and social needs. Being aware of the following symptoms and knowing how to manage them can provide much comfort and relief for the dying.

#### **Dyspnea**

Dyspnea is a frequent complaint for HIV/AIDS patients, who have often suffered from chronic pulmonary disease during the course of their illness. Breathing through a straw readily demonstrates the discomfort and anxiety produced for patients with severe dyspnea.

As in all cases, a careful search and empiric treatment for the underlying cause is critical to halt or reverse the parenchymal damage to the lungs. Pulmonary edema from heart, renal, or liver failure are key to recognize and treat with diuretics. A metabolic acidosis with compensatory respiratory alkalosis is a common cause of breathlessness.

Symptomatic treatment with opiates is effective while treating the underlying cause. Many providers fear



respiratory depression or blunting the respiratory drive, which may hasten the death of their patients. Prospective studies have investigated this question of respiratory depression, which does not occur when opiates are cautiously titrated in the breathless patient. In fact, respiratory depression does not occur without concomitant central nervous system depression, which a caregiver can easily identify. The caregiver can hold doses or notify the provider when this occurs.

Anticholinergic medicines such as scopolamine can help to reduce secretions. Providing supplemental oxygen and having the patient sit upright or elevated in bed can also help.

### **Diarrhea**

Diarrhea is common in the end stage of HIV/AIDS and can persist despite appropriate specific treatments for common pathogens. Patients with diarrhea are at risk for volume depletion, electrolyte disturbances, and skin breakdown.

Diarrhea can persist because of resistant or difficult-to-treat pathogens such as *Isospora* or *Microsporidium*; malabsorption from pancreatic insufficiency, bowel wall edema, or bacterial overgrowth; or side effects from medications or overtreatment with laxatives used to offset the constipating effects of opiates. Additional “overflow diarrhea” from severe constipation or fecal impaction also commonly occurs.

Once the underlying causes for diarrhea have been investigated and treated, the following medicines can be useful:

- Kaolin or Pectin help to bulk the stool, but these can have a delayed onset of 48 h.
- Loperamide 4 mg at the onset of diarrhea and then 2 mg after each unformed stool. (Package insert lists 16 mg as the maximum per day.)
- Tincture of opium, which contains 10% morphine. Adult dose, 0.3-1 mL every 2-6 h to maximum of 6 mL/24 h. Child dose, 0.005-0.01 mL/kg of body weight every 3-4 h for a maximum of six doses/24 h.
- Others include bismuth, cholestyramine, and pancreatic enzymes.

### **Constipation**

Constipation is often multifactorial and occurs from too much or too little solid waste, decreased water content

in the stool, and poor motility. Being confined to bed can cause motility problems, as can the use of certain drugs (e.g., opioids). The cause of the constipation needs to be identified prior to initiating treatment by obtaining a thorough history of diet, fluid intake, level of activity, and medications. Physical examination should include palpation of the abdomen and a digital examination of the rectal vault to assess for stool.

Interventions for constipation can include the following:

- Fiber. Constipated patients may improve if fiber (e.g., psyllium) is added to their diet. However, patients with minimal fluid intake or poor gut motility at the end-of-life stage may develop a fecal impaction from eating more fiber.
- Laxatives and stool softeners. Magnesium hydroxide, senna, docusate, and bisacodyl are all medicines that soften stool and should be used with opiates.
- Sorbitol or lactulose. Stool water content can be increased by increasing the amount of fluid intake or adding osmotically active particles that retain water.
- Restriction of fruit juices. Juice draws water into the gut, exacerbating dehydration.
- Lubricants. Mineral oil taken orally and glycerin suppositories or soap-based enemas given rectally ease the passage of stool by lubrication.

### **Nausea and Vomiting**

Nausea and vomiting often occur and can lead to medication nonadherence, dehydration, electrolyte imbalances, malnutrition, and wasting. Obstruction of the bowel caused by constipation, dysmotility, infection, inflammation, medications, and psychological factors can lead to nausea and vomiting. A thorough history should be obtained, with particular attention to associated symptoms and factors that increase or decrease these symptoms.

If possible, one should treat the underlying cause of nausea and vomiting. Otherwise, one can use several palliative interventions to help decrease symptoms and promote optimal hydration and nutrition, including the following:

- Avoid favorite foods when nauseated to prevent aversion to that food in the future.
- Avoid reclining or lying supine after eating; reflux and nausea may occur.

- Eat (or serve) small portions of food at mealtime.
- Foods and liquids at cool temperatures may be better tolerated by someone who is nauseated.

### **Anorexia**

Patients near the end-of-life stage often experience significant weight loss from many factors. Weight loss of more than 10% of premorbid weight can cause significant morbidity and is a risk factor for early mortality.

Weight loss is caused by decreased intake from chronic nausea or early satiety, increased metabolism from HIV or an underlying malignancy, or psychological factors including depression.

Megestrol or Marinol can have limited efficacy in appetite stimulation. Cyproheptadine, or Periactin, is effective for appetite stimulation in children.

### **Peripheral Edema**

Peripheral edema can occur in the end-stage patient from heart, liver, or renal failure, but it is commonly a result of hypoalbuminemia that results from chronic wasting and malnutrition. Identifying the cause via history, physical, and laboratory analysis is always indicated.

Peripheral edema may be only cosmetically disturbing when mild but can lead to pain, draining sores, infection, and decreased mobility when severe.

Diuretics and salt restriction are key treatments for edema but should be used with caution where routine monitoring of electrolytes and volume status are limited; overdiuresis can hasten volume depletion, renal failure, and death.

To treat edema, using diuretics, such as HCTZ (hydrochlorothiazide) 12.5-50 mg once daily, is moderately useful, but only if the creatinine level is less than 1.5 mg/dL (132  $\mu$ mol/L). This treatment approach does not work when the creatinine level is greater. Lasix 20 mg twice daily and up (adult dosing; pediatric dosing, 1 mg/kg of body weight/dose) is effective but requires potassium supplementation and creatinine monitoring. Elevation of the legs above the hips for 30 min three times per day is helpful. Compression stockings are useful for preventing edema and limiting accumulation when ambulating.

### **Intractable Hiccups**

Although occasional hiccups can be amusing, intractable hiccuping can be disruptive and distressing to patients. Hiccups commonly occur from irritation of the vagus or phrenic nerves that innervate the diaphragm and can be irritated by infections of the lungs or gastrointestinal tract. Other causes include systemic diseases such as renal failure or liver disease.

Treatments for hiccups are limited and lacking in evidence but have been attempted because of the debilitating nature of hiccups. The following treatments include medicines that have many interactions with other drugs and should be used cautiously in HIV patients, who often are already on many other medications.

- Chlorpromazine 25-50 mg per os three times daily. Chlorpromazine is the only U.S. Food and Drug Administration-approved drug for hiccups.
- Baclofen 5 mg per os three times daily is also useful for symptom relief.

### **SUMMARY**

Pain can be a debilitating aspect of living with HIV/AIDS. The health care provider must assist each patient in being as pain free as possible. Children with HIV/AIDS in particular require special advocacy because they often rely on adult caregivers to respond to their pain. Effective medicinal and nonmedicinal mechanisms exist to recognize and treat pain. Attention to certain key symptoms at the end-of-life stage for terminally ill patients can relieve much suffering.

### **REFERENCES**

1. Sethna NF, Berde CB. Analgesics for the treatment of pain in children. *N. Engl. J. Med.* 2002;347:1094-1103.
2. WHO Integrated Management of Adult and Adolescent Illness. (2004). Palliative care: symptom management and end-of-life care. Available at <http://www.who.int/entity/3by5/publications/documents/en/genericpalliativecare082004>. [Accessed January 24, 2008.]
3. Gaughan DM, Hughes MD, Seage GR, et al. The prevalence of pain in pediatric human immunodeficiency virus / acquired immunodeficiency syndrome as reported by participants in the Pediatric Late Outcomes Study (PACTG 219). *Pediatrics* 2002;109:1144-1152.

4. UNAIDS Technical Update. (2000). *AIDS: Palliative Care*. Available at [http://data.unaids.org/publications/IRC-pub05/jc453-pallicare-tu\\_en.pdf](http://data.unaids.org/publications/IRC-pub05/jc453-pallicare-tu_en.pdf). [Accessed January 26, 2008.]
5. American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health. The assessment and management of acute pain in infants, children, and adolescents. *Pediatrics* 2001;108:793-797.
6. Hirshfeld S, Moss H, Dragisic K, et al. Pain in pediatric human immunodeficiency virus infection: incidence and characteristics in a single-institution pilot study. *Pediatrics* 1996;98:449-452.
7. Bursh B, Zeltzer LK. Pediatric pain management, pp. 358-366. In Behrman RE, Kliegman RM, Jenson HB (Eds.) *Nelson Textbook of Pediatrics*. 17th ed. Philadelphia: Saunders, 2004.
8. Franck LS, Greenberg CS, Stevens B. Pain assessment in infants and children. *Pediatr. Clin. North Am.* 2000;47:487-512.
9. Galloway K.S., Yaster M. Pain and symptom control in terminally ill children. *Pediatr. Clin. North Am.* 2000;47:711-746.
10. Weissman DE. Converting to/from transdermal fentanyl, 2nd ed. Fast Fact and Concept #2: July 2005. End-of-Life Palliative Education Resource Center. Available at <http://www.eperc.mcw.edu>. [Accessed January 24, 2008.]
11. Salacz M. Fast Fact and Concept #100. Megestrol acetate for cancer anorexia/cachexia. October 2003. End-of-Life/Palliative Education Resource Center. Available at <http://www.eperc.mcw.edu>. [Accessed January 24, 2008.]