

# Acute Pain: Evaluation and Management

Three (3.0) Contact Hours

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## Acknowledgements

***RN.com acknowledges the valuable contributions of...***

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### **Purpose and Objectives**

***After successful completion of this course, you will be able to:***

- Review basic physiology of pain.
- Identify appropriate components of pain assessment.
- Identify management options, including pharmacologic and non-pharmacologic interventions to alleviate acute pain.
- Describe considerations of pain with acute illness, post-operative and/or procedural pain, pain with trauma, and pain with burns.
- Discuss common barriers to effective pain management.

The purpose of this course is to provide a brief overview of pain, and discuss assessment and management of acute pain conditions.

### **Introduction**

Pain is individualized and is a subjective feeling that is an unpleasant experience. It is a result of injurious stimuli, and can be an important symptom for diagnoses. "It may be mild or severe, chronic or acute, lancinating, burning, dull or sharp, precisely or poorly localized, or referred. Experiencing pain is influenced by physical, mental, biochemical, psychologic, physiologic, social, cultural, and emotional factors" (Mosby's Medical Dictionary, 2012).

This course will cover material associated with assessment and management of acute pain with adult and pediatric patients. Pain in the neonate, although briefly discussed, is outside the scope of this course. Pain management associated with labor and delivery is outside the scope of this course.

### **Review: Process of Pain**

Nociception is the process where information about tissue damage is conveyed to the central nervous system through sensory receptors (nociceptors). There can be pain without nociception (such as phantom limb pain), or nociception without pain.

Pain occurs through four activities:

- **Transduction:** energy is converted from a noxious stimulus (thermal, mechanical, or chemical) into electrical energy (nerve impulses) by nociceptors.
- **Transmission:** the transmission of the neural signals from the transduction site to the spinal cord and brain.
- **Perception:** in higher structures, the arriving signals are appreciated as pain.
- **Modulation:** occurs at the spinal cord level; descending input from the brain influences (modulates) nociceptive transmission.

(American Pain Society, 2007)

### **Types of Pain**

Pain is categorized as **nociceptive** or **neuropathic**, depending on the underlying pathophysiology.

Nociceptive pain is caused by the ongoing activation of nociceptors responding to noxious stimuli (such as inflammation, injury, or disease). Visceral pain arises from visceral organs, while pain coming from tissues is called somatic pain. Somatic pain may be superficial or deep. In nociceptive

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pain, the central nervous system is functioning appropriately. There is a close association between the intensity of the stimulus and the perception of pain, indicating real or potential tissue damage.

Neuropathic, or pathologic, pain is caused by abnormal signals in the central or peripheral nervous systems, demonstrating injury or impairment. Causes of neuropathic pain may include inflammation, trauma, infections, tumors, metabolic diseases, toxins, or neurological disease (American Pain Society, 2007).

### **Nociceptive-Visceral Pain**

**Location:** Visceral organs.

**Quality of pain:** Sharp stabbing, squeezing, spasms, pressure, cramping, or deep aching.

**Localization:** Well or poorly localized; generalized pain.

**Sources:** Ischemia, inflammation, organ distension, muscle spasm.

### **Examples of Visceral Pain**

Some examples include appendicitis, pancreatitis, gastric ulcer, bladder distension, or sickle cell disease (Alexander, 2013; American Pain Society, 2007; CPM Resource Center, 2010a & b).

### **Nociceptive-Somatic pain**

**Location:** Skin, tissue, muscles, tendons, joints, bones.

**Quality of pain:** Superficial somatic pain is described as burning, sharp, or prickling. Deep somatic pain is labeled as dull, aching, cramping, prickling, and throbbing. Somatic pain may also be described as constant.

**Localization:** Superficial somatic pain can be well localized. Deep somatic pain is diffuse and radiating.

**Sources:** Traumatic events, strain, injury, ischemia, inflammation, dermatological. Results from injury to the skin, mucosa, muscle, tendons, ligaments, joints, bones, arteries.

### **Examples of Somatic Pain**

Superficial somatic pain is caused by external events that may be mechanical, chemical, or thermal. Examples may include surgery, burns, cuts, contusions, abrasions, injections, or dermatological disorders.

Deep somatic pain may result from mechanical injury, overuse, inflammation, or ischemia. Examples include arthritis, tendonitis, or otitis media (Alexander, 2013; American Pain Society, 2007; CPM Resource Center, 2010a & b).

### **Neuropathic Pain**

**Location:** Peripheral.

**Quality of pain:** Sensitivity, burning, aching, shock sensations, shooting, cramping, throbbing, numbness, or tingling.

**Localization:** Diffuse; can be difficult to determine. May be radiating or specific to an area.

**Sources:** Peripheral nerve damage, lesions, demyelination, trauma, compressive, metabolic disorders, ischemia, circulatory impairment, CNS disease.

### Examples of Neuropathic Pain

Diabetic neuropathy, neuralgia, carpal tunnel syndrome, phantom limb pain, post-stroke, or autoimmune disorders (such as multiple sclerosis or fibromyalgia) (Alexander, 2013; American Pain Society, 2007; CPM Resource Center, 2010a & b).

#### Test Yourself

Which type of pain is associated with organs?

Neuropathic

*Visceral - Correct!*

Somatic

#### Review: Acute versus Chronic Pain

Pain can be classified as **acute** or **chronic**. Acute pain is complex, and is described as an unpleasant experience with an identifiable precipitating cause. Acute pain generally has defined pathology, and can resolve with healing of the underlying injury. Acute pain can also be seen as a reflexive and protective response.

Chronic pain is described as pain that persists at least three months beyond the expected course of an acute injury or illness. Chronic pain can also disrupt activities of daily living and sleep, and has no protective purpose (Alexander, 2013; American Pain Society, 2007).

#### Acute Pain

Acute pain is:

- Usually associated with degree of tissue damage, which decreases with healing of the injury.
- A result of activation of nociceptors and/or neurons, and is associated with mechanical, chemical, or thermal stimulus.
- Often associated with the autonomic nervous system and other protective responses (e.g. guarding behaviors).
- Generally responsive to opioid and non-opioid therapies.
- Often present in patients with chronic pain.

#### Chronic Pain

Chronic pain is:

- Difficult to identify, as the underlying pathology /or the extent of the pain may be insidious. Chronic pain may be present without physiologic signs.
- Perpetuated by factors apart from the cause.

- Continuous or intermittent, with or without acute exacerbations.
- Not often associated with symptoms of autonomic nervous system hyperactivity.
- Often expressed as depression, irritability, changes in affect, social withdrawal, fatigue, changes in activities of daily living and disrupted social relationships.
- Associated with a common experience of loss, such as loss of activity or identity. Grief may occur simultaneously with chronic pain.

### **Acute and Chronic Pain**

A patient with a chronic illness may also experience acute pain. This could be from a separate disease process or trauma, or related to the chronic process. When an acute episode occurs from the chronic disorder, it is known as “breakthrough pain.” This can also be an increase in the intensity of the chronic pain. Each new pain episode should be assessed and evaluated separately. A completely different pain regimen may be needed to manage the acute pain, and there may be a separate cause for this pain. Making an assumption that the acute pain is simply related to the chronic process can be detrimental to the patient.

### **Pain Assessment**

Pain is often referred to as the “fifth vital sign,” and should be assessed regularly and frequently. Pain is individualized and subjective; therefore, the patient’s self-report of pain is the most reliable gauge of the experience. If a patient is unable to communicate, the family or caregiver can provide input. Use of interpreter services may be necessary.

Components of pain assessment include:

- History and physical assessment
- Functional assessment
- Psychosocial assessment
- Multidimensional assessment

### **History and Physical Assessment**

The assessment should include physical examination including the systems in relation to pain evaluation. Areas of focus should include site of the pain, musculoskeletal system, and neurological system. Other components of history and physical assessment include:

- Patient’s self-report of pain.
- Patient’s behaviors and gestures that indicate pain (e.g. crying, guarding, etc.). See objective behaviors later in this course.
- Specific aspects of pain: onset and duration, location, quality of pain (as described by patient), intensity, aggravating and alleviating factors.
- Medication history.
- Disease or injury history.
- History of pain relief measures, including medications, supplements, exercise, massage, complementary and alternative therapies (“What makes it better or worse?”) (Anderson, 2013; American Pain Society, 2007; Oregon Pain Commission, 2012).

### **Functional and Psychosocial Assessment**

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Components of the functional and psychosocial assessment include:

- Reports of patient's prior level of function.
- Observation of patient's behaviors while performing functional tasks.
- Patient or family's report of impact of pain on activities of daily living, including work, self-care, exercise, and leisure.
- Patient's goal for pain management and level of function.
- Patient or family's report of impact of pain on quality of life.
- Cultural and developmental considerations.
- History of pain in relation to depression, abuse, psychopathology, chemical or alcohol use.
- Impact of pain on patient's cognitive abilities (Anderson, 2013; American Pain Society, 2007; Oregon Pain Commission, 2012).

### Test Yourself

History components that are required as part of assessment include:

History of substance use

History of medications

Medical history

*All of the above - Correct!*

### Multidimensional Assessment

Many tools are available for an in-depth, multidimensional pain assessment. This is particularly important with patients that have chronic pain, mixed pain (both acute and chronic), or complex situations (such as multiple disease processes). Common examples of these tools include:

- **Brief Pain Inventory:** Provides patient input in describing pain and effects, including psychosocial components. Can be viewed [here](#).
- **McGill Pain Questionnaire:** Patients can use descriptors for their pain, which provides information about the experience and intensity. The questionnaire can be viewed [here](#).

### Pain: Verbal Reports

Conducting an in-depth pain assessment will assist you in developing a comprehensive pain management plan. If patients are able to communicate, it is important to incorporate verbal reports of pain using descriptions and/or appropriate tools. Pain must be assessed and recorded in a manner that promotes reassessment. By using the acronym PQRST, you can easily and confidently perform and document a comprehensive pain assessment.

### Provocative or Palliative: What makes the pain better or worse?

**Quality:** Describe the pain. Is it burning, shooting, aching, stabbing, crushing, etc.?

**Radiation:** Does the pain radiate to another body part?

**Severity:** Use appropriate pain scale to determine severity of pain

**Timing:** Does it occur in association with something else? (e.g. eating, exertion, movement).

### Provocation or Palliative Symptoms

Assessment of provocative or palliative symptoms gives you clues to the origin of pain. Ask the

patient what makes the pain better or worse. For example, exertion may intensify anginal pain and rest may alleviate it. Movement of an injured body part may intensify pain while applying heat or cold to the injured part may ease the pain. Gastrointestinal pain may either improve or worsen with food intake. Additionally, post-surgical pain is often intensified prior to getting out of bed, or while ambulating or coughing and deep breathing.

While assessing for provocative or palliative symptoms that accompany the patient's pain, ask about other associated symptoms as well. Accompanying symptoms provide additional clues to the origin or nature of the patient's pain. For example, diaphoresis and nausea often accompany cardiac pain. Also, burning and tingling in an ipsilateral (on the same side of the body) limb may accompany sciatic pain.

### **Quality**

Pain descriptors such as; aching, throbbing, burning, piercing, shooting, tearing, or crushing can also give clues to the origins of pain. Remember, somatic pain is most commonly described as localized, aching, and throbbing. Visceral pain is often described as deep, cramping, referred, aching, or gnawing. Neuropathic pain is often described as burning, piercing, lacerating, and pricking.

Qualifying the patient's pain allows you and your team to determine the appropriate analgesic or adjuvant treatment.

### **Radiation**

Ask the patient where the pain on their body is. They can point, describe, or use an outline of a person to shade in areas that are painful. Pain is localized if the patient can point to exactly where it is hurting. If the patient can pinpoint where the pain is, it is often somatic in origin (bone, muscle, or connective tissue). Referred pain or pain that radiates is not well localized and can complicate understanding a person's pain if a thorough history is not explored. Some common pathologic processes that cause pain to radiate or be referred include acute coronary syndrome, gall bladder disease, appendicitis, and pancreatitis.

Depression and anxiety also play key roles in pain processing and may exacerbate pain. When a patient describes their pain as being all over their body, chronic pain syndromes and psychological components of the pain should be explored.

### **Severity**

Most patients are able to use a pain rating scale to quantify their pain. There are many different pain scales available today, which will be discussed in this course. When selecting a pain scale, it is important to ensure that the selected pain scale is applicable to the patient population for whom it is being used.

### **Timing**

When assessing the timing of pain, the patient should be asked how long the pain has lasted and how often it occurs. Chronic pain usually lasts for longer than six months. Acute pain is commonly related to a new disease process, bodily injury, post-surgery or post-procedure, or may be an exacerbation of chronic pain. Pain that is always present may be termed baseline pain. Baseline pain may be aggravated by acute increases in intensity throughout the day. This is known as breakthrough pain. Often, patients with chronic disease and post-operative patients experience both baseline and breakthrough pain.

### **Test Yourself**

The Acronym PQRST can be used with pain assessment. What does the "T" in this acronym stand for?

Type of pain

Timing of pain - Correct!

Tone of the affected area

### **Common Pain Scales**

Subjective reports of pain are vital to assessment and management strategies. Use of a pain scale for the patient's self-report of pain, along with descriptions of pain, are essential. There is a variety of pain scales available used for pain assessment, for patients from neonates through advanced ages.

The most common scales recommended for use with pain assessment are:

- Numeric scale
- Wong-Baker scale (also known as the FACES scale)
- FLACC scale
- Checklist of Nonverbal Pain Indicators (CNPI)
- Neonatal/Infant Pain (NIPS) Scale

(Health Care Association of New Jersey, 2011)

### **The Numeric Scale**

The numeric scale is the most commonly used pain scale with adult patients, rating pain on a scale of 0-10. Many nurses ask for a verbal response to the question. Use of this scale with the visual analog can provide a more accurate response. This scale is appropriate with patients aged nine and older that are able to use numbers to rate their pain intensity (Health Care Association of New Jersey, 2011).

### **Wong-Baker Scale (FACES)**

The Wong-Baker FACES Scale uses drawn faces for patients to express their level of pain. The faces are associated with numbers on a scale ranging from 0 to 10. This scale is most commonly used with children, and is appropriate to use with patients ages three and older. Adults who have developmental or communication challenges may benefit from using this scale (Health Care Association of New Jersey, 2011).

### **FLACC Scale**

FLACC is the acronym for Face, Legs, Activity, Cry, and Consolability. This scale is based on observed behaviors, and is most commonly used with pediatric patients less than three years of age. The behaviors that are described are associated with a number; each component is totaled for a number ranging from 0 to 10. This scale is also appropriate with patients who have developmental delays or are non-verbal (Health Care Association of New Jersey, 2011).

### **The Checklist of Nonverbal Pain Indicators (CNPI)**

The CNPI is used for adults who are nonverbal; it also designed to measure pain behaviors in cognitively impaired older adults.

Each item is scored both with movement and at rest. Score is “0” if the behavior was not observed. Score is “1” if the behavior occurred even briefly. The scores are subtotaled for the movement and at rest columns, and added together for a total score.

There are no clear cut-off scores to indicate severity of pain. Instead, the presence of any of these behaviors may be indicative of pain and warrants further investigation, treatment and/or monitoring

### **The Neonatal-Infant Pain (NIPS) Scale**

The NIPS scale is recommended for children less than one year old. The tool uses the behaviors that nurses have described as being indicative of infant pain or distress. It is composed of six (6) indicators, and each behavioral indicator is scored with 0 or 1 (except "cry", which has three possible descriptors and is scored with a 0, 1 or 2). A score greater than 3 indicates pain. Infants should be observed for one minute in order to fully assess each indicator

### **Test Yourself**

The most appropriate scale to use with a seven year old patient is:

Numeric scale

FLACC scale

*Wong-Baker FACES scale - Correct!*

### **Pain: Objective Behaviors**

Objective behaviors observed by the healthcare professional should also be considered with pain assessment. Although these observations can indicate pain, absence of these behaviors does not indicate absence of pain.

These behaviors may include:

- Autonomic responses, such as change in heart rate, respiratory rate, blood pressure, pupil dilation, diaphoresis. This response will decrease with duration of pain and is a less reliable indicator over time.
- Expressive behavior (such as restlessness, irritability, crying, moaning).
- Guarding behavior (such as protective guarding, positioning, posturing/movement, rubbing).
- Increased self-regulatory behaviors (such as rocking or fidgeting).
- Grimacing or facial mask of pain.
- Narrowed focusing (such as social withdrawal, impaired thought processes, altered time perception).
- Self-focusing behaviors, or questions meaning of pain.
- Distraction behaviors (such as repetitive activities, pacing, seeking out other people).
- Change in physical appearance from lack of sleep (such as appearing fatigued or tense, dull eyes).
- Alteration in muscle tone.
- Nausea, vomiting, anorexia, constipation, diarrhea.
- Fatigue, weakness.

- Decrease in ability to perform activities of daily living.
- Decreased libido.

### Principles of Pain Assessment

Pain Assessment IS:	Pain Assessment is NOT:
<ul style="list-style-type: none"> <li>• Asking and believing the patient</li> <li>• Assessing the patient</li> <li>• Assessing the cause of the pain</li> <li>• Communicating the findings</li> <li>• Assessing changes in behavior for potential pain</li> </ul>	<ul style="list-style-type: none"> <li>• Relying on changes in vital signs</li> <li>• Deciding that a patient doesn't look uncomfortable</li> <li>• Knowing how much a procedure or disease "should" hurt</li> <li>• Assuming a patient will tell you when they are in pain</li> </ul>

### Standards of Care

Management of pain is a critical area of healthcare and is addressed by the accreditation agencies, such as The Joint Commission (TJC) and Det Norske Veritas (DNV), who clearly outline how healthcare institutions should assess and manage pain.

According to TJC's Standards of Care, the identification and treatment of pain is an important component of the plan of care. Patients can expect that their healthcare providers will ask them if they have pain. When pain is identified, the individual is assessed based on the clinical presentation and in accordance with the care, treatment and services provided by the organization (Joint Commission Standards, 2010).

TJC provides four elements of performance in pain assessment:

- The hospital must conduct a comprehensive pain assessment that is consistent with its scope of care, treatment and services and the patient's condition.
- The hospital must use methods to assess pain that are consistent with the patient's age, condition and ability to understand.
- The hospital reassesses and responds to the patient's pain, based on the assessment criteria.

- The hospital either treats the patient's pain or refers the patient for treatment (TJC Elements of Performance, 2010).

### **Standards for Pain Assessment**

Assessment and reassessment of pain are critical components of pain management. Based on the patient's condition, information gathered in the initial assessment includes the following:

- Physical, psychological, and social assessment.
- Nutrition and hydration status.
- Functional status.
- For patient who are receiving end-of-life care, the social, spiritual, and cultural variables which influence the patient's and family members' perception of grief.
- Cultural or religious practices that may affect care.
- Care the family or support system is capable of and willing to provide.
- Educational needs, including the abilities, motivation, and readiness to learn.
- Barriers and safety hazards in the home environment.
- Any other relevant information that may affect the patient's goals.
- During patient assessments and reassessments, the hospital must gather relevant data and information to perform a comprehensive assessment; and reassessment must occur within defined time frames, in accordance with local law and regulation.

Each patient must be reassessed as necessary based on his or her plan for care or changes in his or her condition.

### **Standards for Pain Assessment**

The Centers for Medicare and Medicaid Services (CMS) also provide guidelines for the assessment and treatment of pain for acute care, long-term care, and ambulatory settings. The HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) survey is submitted to CMS from hospitals for public reporting of data. One of the topics included in the HCAHPS survey is pain management. The questions included in this section are:

- How often was your pain well controlled? (Q13)
- How often did the hospital staff do everything they could to help you with your pain? (Q14)

For more information on HCAHPS, see RN.com's course on The Role of the Staff Nurse in Patient Satisfaction and HCAHPS.

### **Pain Management**

Pain management refers to the appropriate treatment and interventions developed in relation to pain assessment, and should be developed in collaboration with the patient and family. Strategies are developed based on past experiences with effective and non-effective treatments to meet the patient's goal for pain management. Considerations include type of pain, disease processes, risks, and benefits of treatment modalities. Pain management strategies include pharmacological and non-pharmacological approaches (American Pain Society, 2007; Health Care Association of New Jersey, 2011).

## Effects of Pain That is Not Relieved

Unrelieved pain can actually cause systemic effects. Some of these effects include:

- **Metabolic:** hyperglycemia, glucose intolerance, insulin resistance, gluconeogenesis, hepatic glycogenolysis, muscle protein catabolism, increased lipolysis, hypokalemia.
- **Cardiovascular:** increased heart rate and cardiac output, increased peripheral and systemic vascular resistance, hypertension, increased coronary vascular resistance, increased myocardial oxygen consumption, hypercoagulation, venous thromboembolism.
- **Respiratory:** hypoxemia, decreased respiratory volumes, atelectasis, shunting, decreased cough, respiratory infection.
- **Endocrine:** increased cortisol, adrenocorticotrophic hormone, increased antidiuretic hormone, increased epinephrine and norepinephrine, increased growth hormone, increased catecholamines, increased renin and angiotensin II, increased aldosterone, increased glucagon, decreased insulin, decreased testosterone, increased interleukin-1.
- **Genitourinary/Gastrointestinal:** urinary retention/decreased urinary output, fluid overload, decreased gastric motility, anorexia.
- **Musculoskeletal:** muscle spasm, impaired muscle function, immobility.
- **Immune:** decreased immune response.
- **Cognitive/Developmental/Quality of Life:** fatigue, mental confusion, reduction in cognitive function, increased behavioral and physiologic responses to pain, altered temperament, increased somatization, increased vulnerability to stress disorders/addictive behavior, sleeplessness, anxiety, fear, hopelessness, increased thoughts of suicide.
- **Unrelieved acute pain** can convert to chronic pain (CPM Resource Center, 2010a & b).

## Test Yourself

A potential consequence of unrelieved pain is:

Increased respiratory rate

*Increased heart rate - Correct!*

Increased mental alertness

## Non-Pharmacological Treatment

There are a variety of approaches for decreasing pain in adult and pediatric patients that are non-pharmacological. These types of strategies are often over-looked, but can be effective for alleviating pain when used either alone or in combination with other non-pharmacological or pharmacological measures. Non-pharmacological interventions may include:

- Heat or cold (as appropriate)
- Massage
- Therapeutic touch
- Decreasing environmental stimuli (e.g. sound, lighting, temperature)
- Range of motion or physical therapy
- Repositioning
- Immobilization
- Relaxation techniques and imagery
- Distraction

- Psychotherapy or cognitive behavioral therapy
- Biofeedback
- Music therapy
- Aromatherapy
- Acupressure or acupuncture
- Transcutaneous electrical stimulus (TENS)

(American Pain Society, 2007; City of Hope National Medical Center, 2011; CPM Resource Center, 2010a, 2010b, 2010c, 2010d)

### WHO Analgesic Ladder

One tool that was developed by the World Health Organization (WHO) in 1986 is the WHO analgesic ladder. This framework was originally developed to assist physicians in treatment choices for cancer pain. This tool continues to be validated, and used for not just cancer pain, but other forms of acute and chronic pain (CPM Resource Center, 2010a; CPM Resource Center, 2010c; Schaffer, 2010).

The analgesic ladder is used as a guideline, and is described as follows:

Step One: Moderate pain (e.g. rating of 4-6): Continue with medications and methods described in step 1, plus add a mild opioid.

Step Two: Mild pain (e.g. rating of 0-3 on a scale of 0-10): Uses non-opioid and/or a nonsteroidal anti-inflammatory drug (NSAID), and other non-pharmacological strategies to improve quality of relief.

Step Three: Severe pain (e.g. rating of 7-10): Along with medications and strategies described in steps 1 and 2, add a more potent opioid (e.g., morphine, hydromorphone, fentanyl) (CPM Resource Center, 2010a; CPM Resource Center, 2010c; Schaffer, 2010).

### Test Yourself

The WHO Analgesic Ladder can only be used for patients experiencing cancer pain.

True

False - Correct!

### Pharmacological Treatments

The use of medications to treat pain can be complex. Multiple factors must be considered including age, current medications, patient medical and substance use history, type of pain (such as neuropathic versus nociceptive), etc. Pharmacological treatments include:

- **Analgesic:** Acetaminophen (Tylenol®) is a common analgesic used for mild pain, or in a combination with opioids for moderate pain. Acetaminophen has antipyretic and analgesic effects. Often acetaminophen has fewer adverse effects and may be used safely in patients with decreased platelets or gastrointestinal disorders. However, acetaminophen has very little effect against inflammation. There must be caution taken in the amount of acetaminophen used per day, which can result in hepatic toxicity; there a maximum dose of 4000 mg/day in most adult patients, and 3000 mg/day with elderly patients (Hodgson & Kizior, 2013).
- **Non-steroidal anti-inflammatories (NSAIDs):** Common examples include salicylates, ibuprofen (Advil®), naproxen (Aleve®), and ketorolac (Toradol®). These are used to reduce inflammation which can decrease pain, as well as antipyretic effects. NSAIDs can be used for mild pain, or in

combination with opioids for moderate pain. The adverse effects of NSAIDs include gastrointestinal dysfunction (nausea, vomiting, diarrhea, cramps, and gas), gastric ulcers and/or gastric bleeding, and interference with platelet aggregation. Caution is needed with dosages for pediatric and elderly patients, and is contraindicated in patients with hepatic or renal impairment, bleeding disorders and/or low platelets, or gastrointestinal ulcers (Hodgson & Kizior, 2013).

- **COX-2 inhibitors:** Cox-2 inhibitors were developed to reduce inflammation by selectively blocking the cyclooxygenase-2 (Cox-2) enzyme. Blocking this enzyme halts the production of prostaglandins that cause the pain and swelling. The COX-2 inhibitors represent a new class of drugs that do not affect COX-1, but selectively block only COX-2. This selective action provides the benefits of reducing inflammation without irritating the stomach. The analgesic efficacy of COX-2 selective inhibitors is comparable to non-selective NSAIDs such as naproxen, ibuprofen, and sulindac, and is of great value to people with arthritis. Recent information about risks of Cox-2 Inhibitors has severely limited their use. Celebrex is now the only Cox-2 drug on the market and it carries a very strong warning against cardiovascular and skin complications.
- **Tricyclic antidepressants (TCAs):** Examples include amitriptyline (Elavil®), nortriptyline (Aventyl®), and desipramine (Norpramin®). TCAs can be effective in treating neuropathic pain, and can provide a mild analgesic effect. Analgesia generally occurs within a few days to a week, whereas antidepressant effect takes longer to occur. Caution should be taken with pediatric and elderly patients.
- **Selective serotonin reuptake inhibitors (SSRIs):** Common examples include fluoxetine (Prozac®), paroxetine (Paxil®), serotonin, and sertraline (Zoloft®). SSRIs can be used as adjunct therapy for depression and neuropathic pain. Caution is required with pediatric and elderly patients, as there is a risk of suicidal thoughts.

### Did You Know

In October 2004, Vioxx, known generically as rofecoxib, was recalled in the largest prescription drug withdrawal in history. The withdrawal was prompted after a new study examining Vioxx's impact on bowel cancer found the drug caused an almost twofold increase in heart attacks and strokes. However, the controversy did not end there. The FDA requested that Pfizer withdraw Bextra (valdecoxib) from the market because the overall risk of heart disease and life-threatening skin reactions outweighed its therapeutic benefits. Another Cox-2 inhibitor, lumiracoxib is available outside of the U.S. and is marketed under the name Prexige. This drug has serious hepatotoxic side effects and has never been approved for use in the United States.

### More Pharmacological Treatments

- **Anticonvulsants:** Examples include carbamazepine (Tegretol®), gabapentin (Neurontin®), and pregabalin (Lyrica®). Anticonvulsants can provide sedation and a graded analgesic effect, and can be effective with neuropathic pain.
- **Corticosteroids:** Common examples include dexamethasone and prednisone. Corticosteroids can be given to reduce inflammation, and may be used briefly with acute pain episodes or with chronic conditions.
- **Topical agents:** Common examples include creams that have analgesic or local anesthetic agents. Topical agents may be used with neuropathies or arthritis.
- **Anesthetics:** Anesthetics can be used for epidurals or nerve blocks to assist with acute or chronic pain. These are temporary, and may be effective up to three or four months. Risks and benefits must be evaluated prior to performing a block.
- **Opioids:** Common examples of mild opioids include codeine, oxycodone, and hydrocodone.

Common examples of more potent opioids are morphine, fentanyl, and hydromorphone, used for moderate to severe pain. Opioids can be used with both acute and chronic pain. Opioids are commonly administered through enteral and parenteral routes. Some may even be administered transdermally, subcutaneously, intrathecally, and epidurally. Around the clock oral dosing is the preferred mechanism for managing chronic pain. Alternatively, parenteral administration is usually a good choice for acute, surgical pain and breakthrough pain.

(American Pain Society, 2007; City of Hope National Medical Center, 2011; CPM Resource Center, 2010a, 2010b, 2010c, 2010d).

### Test Yourself

Opioids should be considered in addition to other treatment strategies with patients suffering from moderate pain.

*True - Correct!*

False

### Opioid Considerations

Opioids can be part of a treatment plan individualized to the patient. Opioids should not be used as a first line treatment for neuropathic pain, but may be appropriate with the use of other therapies. A trial of opioids can be implemented with patients following non-pharmacological methods, but may be started earlier with severe pain. Risks and benefits of using opioids should be discussed with the patient and family. Considerations for bowel management and prevention of nausea and vomiting are required (American Pain Society, 2007; CPM Resource Center, 2010a, 2010b, 2010c, 2010d).

Medications should be started at lower doses in short-acting form, and titrated up for pain control that correlates with the patient's pain goals. Other considerations include if a patient is opioid naïve or opioid tolerant. A patient who is opioid naïve occurs with patients not already taking opioids, as tolerance can develop after several days. A patient who is opioid tolerant occurs with patients regularly taking opioids, generally associated with chronic pain. Use of recreational substances should also be considered. Opioid tolerant patients will require higher doses to achieve the desired effect (American Pain Society, 2007; Shands, 2012).

### A Closer Look at Opioids

Opioids can be divided into two main groups, mu-agonists and agonist-antagonists, based upon their mechanism of action.

**Mu-agonist opioids:** also referred to as narcotics, and are the most commonly used. These include morphine, codeine, hydromorphone (Dilaudid), fentanyl, methadone, oxycodone, levorphanol, and meperidine. These drugs are used most effectively in malignant, breakthrough, and acute pain, including surgical pain. Adverse effects of these opioids include:

- Constipation
- Nausea and vomiting
- Sedation
- Respiratory depression
- Pruritus

**Agonist-antagonist opioids:** these are most appropriately used for acute, non-malignant pain and may be particularly helpful in nociceptive (visceral or somatic) pain, such as labor and delivery. Some examples of agonist-antagonists are butorphanol (Stadol), nalbuphine (Nubain), and pentazocine. Agonist-antagonist opioids act by displacing opioids at the binding site, but produce less analgesia and have a lower dependency potential than opioids. This group is not useful in the management of chronic pain and is contraindicated in patients taking long-term opioids or those individuals who are physically dependent on opioids, as their use can lead to physical withdrawal symptoms (Hodgson & Kizior, 2013). Other side effects of agonist-antagonist opioids are generally limited.

## Common Opioids

### Codeine

- Indications: mild to moderate, acute pain, such as trauma, post-operative pain
- Routes of Administration: po, sc
- Comments: Often combined with non-opioid for moderate pain; limited use with severe pain

### Hydrocodone

- Indications: moderate to severe, acute pain, such as trauma, post-operative pain, abdominal pain
- Routes of Administration: po
- Comments: Often combined with non-opioid for moderate pain

### Oxycodone

- Indications: moderate to severe, acute pain, such as trauma, post-operative pain, burns; cancer pain
- Routes of Administration: po
- Comments: Often combined with non-opioid for moderate pain; can come in sustained released form

### Meperidine

- Indications: moderate to severe, acute pain, such as trauma, post-operative pain;
- Routes of Administration: po, IV, IM, sc, epidural, intrathecal
- Comments: Not recommended for chronic pain; toxic metabolite can accumulate, causing CNS disturbances and seizures

### Fentanyl

- **Indications:** severe, acute pain, such as trauma, post-operative pain, burns; cancer pain; chronic pain
- **Routes of Administration:** IV, sc, IM, epidural, intrathecal, transdermal (patch)

- **Comments:** IV fentanyl is fast-acting; transdermal fentanyl is not indicated for acute pain or with pediatric patients

### **Hydromorphone**

- **Indications:** severe, acute pain, such as trauma, post-operative pain, burns; cancer pain
- **Routes of Administration:** po, pr, IV, sc, IM, epidural, intrathecal
- **Comments:** Used as alternative to morphine; high potency

### **Morphine**

- **Indications:** severe, acute pain, such as trauma, post-operative pain, burns; cancer pain; chronic pain
- **Routes of Administration:** po, pr, IV, sc, IM, epidural, intrathecal, sl
- **Comments:** Used as standard comparison for all opioids; can stimulate histamine release

### **Opioid Antagonists**

Opioid antagonists reverse the effects of opioid mu-agonists such as morphine, fentanyl, and meperidine. Naloxone (Narcan) is the primary opioid antagonist. Its main purpose is to rapidly reverse opioid induced-respiratory depression. The standard dose is dependent on the age and weight of the patient. The onset of action is within 1-2 minutes, with a peak effect of 5-15 minutes (Hodgson & Kizior, 2013).

### **Did You Know**

- Care must be taken in administering the right opioid for the right patient. For instance, meperidine is not used for chronic pain due to its ceiling effect and potential for accumulation of metabolites, which may lead to seizures.
- Propoxyphene (Darvon) is appropriate for short-term, non-malignant pain due to renal toxicity with long-term use.
- Transdermal fentanyl is not a good choice for acute, surgical pain as pain relief may not occur for several hours after the patch is applied. It is, however, an excellent choice for chronic pain in individuals that cannot tolerate oral dosing, but must be applied over dry, non-edematous skin (Hodgson & Kizior, 2013).

### **Equianalgesic Dose Conversions**

Equianalgesic dosing means using different medications or routes of delivery that provide similar effectiveness of pain control. Often nurses are responsible for managing a patient's pain when converting from one opioid to another or converting from different routes of delivery.

Equianalgesic dose charts should be used to help you determine if the patient is receiving the appropriate dose of medication via the appropriate route when therapy changes are made.

Equianalgesic charts are readily available online, or may be available on your unit. An example of an Equianalgesic dosing chart can be viewed [here](http://www.healthnetworks.health.wa.gov.au/cancer/docs/Opioid_Conversion.pdf).

[http://www.healthnetworks.health.wa.gov.au/cancer/docs/Opioid\\_Conversion.pdf](http://www.healthnetworks.health.wa.gov.au/cancer/docs/Opioid_Conversion.pdf)

**Note that equianalgesic conversion tools should be used as a guide only. Clinical assessment and reassessment is of paramount importance in determining the effectiveness of drug therapy. Clinical judgment and patient response should always guide your practice first and foremost. Dosages on these charts are usually adult approximations, unless otherwise stated.**

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**Doses should be reduced for children or the elderly as clinically indicated.**

### **Acute Pain**

According to the National Institutes of Health, pain is named as the most common reason Americans access the healthcare system. It is a primary cause of disability and it is a major contributor to the costs of healthcare.

Approximately one in every four Americans, or 76.2 million, has suffered from pain that lasts longer than 24 hours and millions more suffer from acute pain (National Institutes of Health, 2013).

### **Acute Pain Treatment Goals**

Acute pain is an intricate and multifaceted experience that generally occurs in response to tissue trauma. Whereas responses to acute pain may be adaptive, they can have adverse physiologic and psychological consequences (see previous slides on effects of unrelieved pain). Acute pain is more difficult to manage if it becomes severe, so prompt and adequate treatment of acute pain is vital. Treatment goals and strategies for acute pain include:

- Early intervention, with quick adjustments in the treatment regimen for inadequately controlled pain.
- Reduction of pain to acceptable levels. It is important to teach patients and families that complete pain relief may not be achievable.
- Facilitation of recovery from underlying disease or injury.

### **Acute Pain Guidelines**

Many guidelines exist for the treatment of acute pain. Some guidelines are hospital-specific, while others have been published for wide usage.

One commonly used algorithm for acute pain has been developed by Institute for Clinical Systems Improvement (ICSI) (2008). The ICSI has also created algorithms for various subcategories of pain.

The assessment algorithm begins with the patient in pain and includes assessment with detailed history, physical exam, and pain assessment.

- If pain is due to an easily reversed etiology, the cause of the pain should be treated.
- If pain has persisted more than six weeks, then the ICSI guideline for chronic pain should be used.
- If pain is from a headache, ankle sprain, low back, dyspepsia, or chest pain, then the appropriate ICSI guidelines should be used.

### **Acute Pain Guidelines**

According to the ICSI (2008), after assessment, the mechanism or mechanisms of pain should be identified to determine the appropriate path for management.

- **Somatic:** Treatment could include cold packs, tactile stimulation, acetaminophen, NSAIDs, opioids, corticosteroids, and/or local anesthetic. Other non-pharmacological methods can be added.
- **Visceral:** Treatment could include corticosteroids, anesthetic agents (such as blocks), NSAIDs, and opioids. Other non-pharmacological methods can be added.

- **Neuropathic:** Treatment could include corticosteroids, anticonvulsants, tricyclic antidepressants, neural blockade, NSAIDS, and opioids. Other non-pharmacological methods can be added.

### **Pain with Acute Illness**

Pain can be associated with acute illness, as a result of inflammatory and/or obstructive processes. Examples of this type of pain include headaches (not including migraines), renal colic (related to renal calculi), appendicitis, and myocardial infarction.

Interventions commonly used with pain from acute illness include:

- **Non-pharmacological:** Use of cold, vibration, immobilization, relaxation, imagery, distraction, decrease in environmental stimuli.
- **Pharmacological:** NSAIDS, acetaminophen, systemic opioids (such as codeine or morphine). Corticosteroids may be used for a brief course.

(American Pain Society, 2007; CPM Resource Center, 2010a & b; Shands, 2012).

### **Post-operative and-or Procedural Pain**

Pain can occur with surgical procedures (perioperatively and postoperatively), with the underlying disease that has required the surgery, and/or with medical or diagnostic procedures. Some examples include open or laparoscopic surgeries, chest tube insertion, biopsy, suturing, and injections.

Recent research on postoperative pain management supports a treatment approach known as multimodal or balanced analgesia. This approach involves the use of more than one method or modality of controlling pain to obtain additive beneficial effects, reduce side effects, or both. This may include using two types of pharmacological therapies, or pharmacological and non-pharmacological treatment.

Considerations for preemptive analgesia, or giving analgesia prior to a procedure, can also reduce the effects following. This may include non-pharmacological and pharmacological methods, including local anesthesia.

Interventions commonly used with pain from surgery or procedures include:

- Non-pharmacological: exercise, immobilization, massage, application of heat or cold, TENS, counter-irritation, relaxation, imagery, distraction, decrease in environmental stimuli, hypnosis, biofeedback, aromatherapy, music.
- Pharmacological: NSAIDS, acetaminophen, systemic opioids (such as morphine and PCA), and adjuvant analgesics (such as local anesthetic). Anesthesia, such as epidurals, intrathecal blocks, or other regional blocks can be effective.

(American Pain Society, 2007; CPM Resource Center, 2010a & b; Shands, 2012).

### **Patient-Controlled Analgesia (PCA)**

Most post-surgical, post-procedural, and acute or breakthrough pain is managed initially via the parenteral route. Parenteral administration of opioids is usually via IV injection, or often by a PCA (patient controlled analgesia) pump. The greatest advantage of PCAs is that, within parameters, they give patients the chance to be involved in their own care by allowing them to control the dosing of their pain medication. PCA pumps deliver a set amount of an opioid at given intervals, by continuous dosing or by a combination of both. Patients do not have to wait for a caregiver if they need additional medication and can administer a pre-determined dose of medication at any time they desire. Because

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the patient is the only one who administers the dose, respiratory depression rarely occurs.

Since sedation is a precursor to respiratory depression, the patient will usually fall asleep prior to administering too much opioid. Thorough patient teaching, as well as teaching for the family is imperative. The family should be warned against administering doses while the patient is sleeping to prevent accidental overdose. No one but the patient should be administering additional doses.

Eventually, the post-surgical patient will be transitioned to an oral route of pain medication. This transition to oral prn dosing usually begins within the first 48 hours post-surgery depending on the patient's condition and surgical procedure. Chronic pain sufferers may also receive opioids parenterally to control breakthrough pain. They too, will eventually be transitioned to the oral route.

### Transition from PCA

Oral around-the-clock dosing is the best way to effectively manage chronic, malignant, and non-malignant pain. The transition between opioid delivery routes is often what causes healthcare providers and patients the most distress in the pain management process, partially because providers do not fully understand equianalgesic dose conversions and patient barriers are prevalent.

### Test Yourself

The use of PCA pumps can increase the danger of over sedation.

True

*False - Correct!*

### Post-operative Epidural Analgesia

Advantages of epidural analgesia include:

- Places the medication near the site of action.
- Provides improved pain control with movement compared to other techniques, especially when local anesthetics are used and the catheter is placed at the level of the incision.
- Less systemic opioids are used and the return of bowel function is enhanced.

### Epidural Indications

Indications of epidural analgesia include:

- **Post-operative pain management:** Appears to be most beneficial for the high-risk surgical patient or for those recovering from extremely large or painful surgical procedures (such as thoracotomies, major upper abdominal, major abdominal vascular, and orthopedic surgeries). The epidural infusion provides a localized band of analgesia at the site of the incision
- **Multiple trauma:** Especially beneficial for patients with chest trauma. The localized analgesia helps the patient overcome the pain-induced splinting that contributes to the loss of pulmonary function which in turn may lead to atelectasis and pneumonia

### Risks and Contraindications for Epidurals

- **Anticoagulation therapy:** Anticoagulation therapy and neuraxial anesthesia used together increase the risk of epidural hematoma which may lead to serious adverse effects such as permanent paralysis; see also anticoagulant safety guidelines.
- **Coagulopathies:** There is an increased risk for an epidural hematoma.
- **Decreased level of consciousness:** Epidural analgesia may be implicated in any progression of

central nervous system dysfunction. Also pain management by epidural analgesia requires accurate reports of pain levels by patient.

- **Infection:** Systemic infection, sepsis, or localized infection at the site of insertion may lead to an infection in the epidural space.
- **Increased intracranial pressure:** An inadvertent dural puncture when trying to locate the epidural space in a patient with increased intracranial pressure, increases the chance of cerebellar or tentorial herniation due to the loss of CSF.

### **Epidurals: Patient Monitoring**

Frequency of assessments and vital signs are very important; review your facility's policy. Conditions that require intervention include:

- Respiratory rate of 8 or less.
- Patient deteriorates to a severe sedation level (somnolent, difficult to arouse).
- Pain relief is not achieved.
- Local anesthetic side effects: Complete loss of sensation; numbness and tingling distal to insertion site (e.g. leg numbness); changes in sensory or motor deficits from last assessment; inability to bear weight or ambulate.
- Postural decrease in BP occurs and patient is symptomatic.
- SBP <90 OR a decrease in BP >20% from baseline.
- HR < 50 OR a decrease in HR > 20% from baseline.
- Nausea/vomiting not relieved by anti-emetics.
- Decrease in SpO2 parameters identified.
- Signs of infection, bleeding, pain, swelling, or drainage at catheter insertion site.
- Patient experiences pain during patient controlled epidural anesthesia (PCEA) dose.

### **Peripheral Nerve Blocks**

The usage for continuous nerve blocks includes perioperative and postoperative pain management, pain management after trauma, and even chronic pain. Over the past decade or so, continuous nerve blocks have gained significant popularity for acute postoperative pain management after major orthopedic and thoracic surgery. Regional blocks have been used with both inpatients and outpatients, and in adults and children, particularly with a multimodal approach to postoperative pain treatment (Chelly, Ghisi, & Fanelli, 2010).

### **Indications for Nerve Blocks**

Indications for continuous nerve blocks include major orthopedic procedures (including total joint replacement, shoulder surgery, upper and lower extremity trauma, arthroplasty), plastic, breast, thoracic, urological, abdominal, pelvic surgery, and multiple rib fractures. Nerve blocks can improve pain management, and assist with early ambulation following surgical procedures, which is associated with improved healing and hospital discharge (Chelly, Ghisi, & Fanelli, 2010).

### **Complications with Nerve Blocks**

Complications associated with peripheral nerve blocks are not common. They include local anesthetic toxicity or over-dosage owing to accumulation or intravascular catheter migration. Other complications include bleeding, nerve injury, and infection (Chelly, Ghisi, & Fanelli, 2010).

## **Nerve Blocks: Patient Monitoring**

Frequency of assessments and vital signs are very important; review your facility's policy.

Conditions that require intervention include:

- Pain relief is not achieved.
- Local anesthetic side effects: Complete loss of sensation; numbness and tingling distal to insertion site; changes in sensory or motor deficits from last assessment; inability to bear weight or ambulate.
- Postural decrease in BP occurs and patient is symptomatic.
- Nausea/vomiting not relieved by anti-emetics.
- Signs of infection, bleeding, pain, swelling, or drainage at catheter insertion site.

## **Pain with Trauma**

Pain from trauma can be complicated by the degree of the injury or injuries, and the need for thorough assessment, including diagnostic procedures. Fears of masking injuries and side effects of respiratory depression or hemodynamic instability can contribute to under-treatment of pain with a trauma patient. Major trauma can include generalized pain and/or regionalized or localized pain. Minor trauma generally exhibits localized pain. The use of some non-pharmacological treatment may also be limited by patients experiencing trauma.

Interventions commonly used with pain from trauma include:

- **Non-pharmacological:** rest, ice, compression, elevation, physical therapy (e.g. stretching), TENS, vibration, heat, relaxation, distraction, hypnosis, psychotherapy, therapeutic communication, aromatherapy
- **Pharmacological:** For major trauma: NSAIDS, acetaminophen (during the healing phase post-trauma), bolus or continuous IV opioids during the emergency phase (such as morphine), and adjuvant analgesics (may include inhaled nitric oxide). Anesthesia, such as regional blocks can be effective if there is also regionalized pain. Multimodal pharmacological therapy may be used, including the use of paralytics and sedatives. Although these medications affect the patient's level of consciousness, they do not provide for pain management. For minor trauma: NSAIDS, acetaminophen, opioids for moderate to severe pain.

(American Pain Society, 2007; CPM Resource Center, 2010a & b; Shands, 2012).

## **Pain with Burns**

Patients who suffer from thermal or chemical burns have pain associated with tissue damage that can vary. The degree of pain does not relate to the severity of the burn. There are three types of burns:

First-degree burns are considered mild compared to other burns, with minimal tissue damage. They result in pain which is generally mild or moderate, and reddening of the epidermis (outer layer of the skin).

Second-degree burns affect the epidermis and the dermis (lower layer of skin). They cause mild to severe pain, redness, swelling, and blistering.

Third-degree burns go through the dermis and affect deeper tissues. They result in charred skin that is either white or blackened. There may be severe pain, or there may be numbness (Richardson &

Mustard, 2009).

### **Did You Know**

The pain experienced will change with tissue regeneration and evolving physiological, psychological and environmental influences. Severely damaged nerves in deep dermal or third degree burns may lead to a relatively insensate area initially, but regeneration will occur within 5–6 weeks of wound closure. Neuropathic pain can also result from disordered regrowth with sprouting to adjacent nerves, spontaneous firing or formation of neuromas (Richardson & Mustard, 2009).

### **Pain with Burns**

Pain management is essential with burns, as unalleviated pain can impair wound healing. The use of some non-pharmacological treatment may also be limited by patients experiencing burns.

Interventions commonly used with pain from burns include:

- Non-pharmacological: rest, elevation, cluster of care, minimizing dressing changes, distraction, relaxation, hypnosis, imagery, aromatherapy
- Pharmacological: For acute phase: bolus or continuous IV opioids (may include PCA); NSAIDS, acetaminophen, and oral opioids may be used with first or second degree burns. Epidural anesthesia may be used, but only after closure of burn wound. Multimodal pharmacological therapy may be used, including the use of paralytics and sedatives. Although these medications affect the patient's level of consciousness, they do not provide for pain management. Preemptive analgesia should be used for dressing changes and other procedures. Neuropathic pain may also be treated with antiepileptics, antidepressants, and other adjuvant therapies. For rehabilitative phase: NSAIDS, acetaminophen; opioids for moderate to severe pain (American Pain Society, 2007; CPM Resource Center, 2010a & b; Richardson & Mustard, 2009).

### **Did You Know**

Procedural treatments of a burn will alter the perception of pain. The depth of the tissue injury will be changed with surgical debridement or excisement of the wound. An autograft (using patient's own tissue), allograft (using donated tissue), or synthetic dressing, when used to cover the burn, generally reduces the pain of the wound. Skin harvest donor sites may actually experience more pain than the injured area itself (Richardson & Mustard, 2009).

### **Test Yourself**

One appropriate pharmacological treatment for pain management with major trauma and severe burns may be:

Lidocaine

*Morphine - Correct!*

Vecuronium

### **Special Populations**

Treating pain in special populations is based upon individual assessment and knowledge of unique characteristics of these populations. Infants and children, the elderly, people from different cultures, and those with a prior history of substance abuse are most likely to experience inadequate pain control. Therefore, it is useful to discuss pain management in terms of the specific beliefs and actions of the healthcare provider toward these populations.

### **Infants and Children**

Pain in infants and children is particularly challenging. A popular misconception is that infants' pain cannot be measured. In fact, infants can express pain through cries and experience an increase in heart rate and drop in oxygenation as painful as stimuli is received.

Additionally, some healthcare professionals often believe that infants do not experience pain as fully as a child or an adult. In reality, at birth the infant's nerve endings are similar if not greater than adults. The infant's cortex has a complete set of neurons at 20 weeks' gestation (Polin, Fox & Abman, 2011).

Likewise, children often do not report their pain and may have difficulties describing or quantifying their pain experience. Utilizing age specific assessments pain tools and knowing common behaviors in infants and children is paramount to understanding and managing their pain.

Parent or guardian support and interpretation of their child's pain can be critical however, in the absence of a parent or guardian how do we safely treat pain in infants and children, without under-treating? As previously discussed, there are many pain scales that can be utilized in this population to qualify and quantify their pain.

### **The Elderly**

The elderly are also at risk for the under-treatment of pain. This is largely because of their inability or reluctance to report pain and healthcare professionals fear of "overdosing" this type of patient. The elderly may also have varying levels of cognitive impairment.

Careful assessment of the cognitively impaired elder through observable indicators and family information about their loved one's pain is very useful in recognizing pain in the elderly.

When providing opioids for pain control, the key is to start at a low dose and titrate upward until a desired effect is reached. Renal dysfunction in the elderly may also inhibit adequate pain management. Therefore, monitoring of appropriate laboratory values is indicated.

For more considerations of medications and the elderly, see RN.com's series on Administering Medications to Elderly Patients.

### **The Cognitively Impaired**

The cognitively impaired is another population at risk for the under-treatment of pain. Successful and safe pain control in these patients can be particularly challenging.

If your cognitively-impaired patient can self-report pain, this is the most reliable indicator of pain, and should be believed. If a person cannot understand or use a numerical rating scale, sometimes a verbal descriptor scale can be utilized effectively (see previous section on pain scales).

### **The Critically Ill**

When caring for critically ill, mechanically ventilated patients, one of the most important priorities is to relieve any pain that the patient might be experiencing. Mechanically ventilated patients can often still self-report pain, either by blinking or raising a finger with some yes/no questions, and try to communicate pain to their nurses.

Some techniques used to report pain in a mechanically ventilated patient include grabbing the healthcare professionals arm, signaling with their eyes, and thrashing their limbs around. Some conscious, intubated patients can self-report and provide some information regarding their pain. This self-report is the most accurate indicator of pain and should be taken seriously.

Pain relief measures should also be considered in the presence of pathologic conditions or when procedures that might cause pain are performed. Healthcare professionals should be aware of and consider behaviors (e.g. facial expressions, body movements, crying), reports from family members, and physiologic measures such as blood pressure and respiratory rate when assessing for pain.

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### **Patients of Varying Cultural Backgrounds**

People from different cultures experience pain largely based on their meaning of pain. Be aware of your own cultural uniqueness and seek to accept the distinct perspectives of others. Be cognizant of your approach to the patient, including the use of non-verbal communication styles. The patient's comfort with eye contact, various body postures, amount of physical space, and appropriateness of touch are individual to various cultures. It is often difficult for you to be knowledgeable about all of the possible cultural norms of patients; however, you can be alert to the patient's verbal and non-verbal cues. A careful approach to the patient in these instances will often set the stage for successful pain management.

### **Patients with Prior History of Substance Abuse**

Treating patients with a prior history of substance abuse can be challenging. You may be torn between providing adequate pain control for the patient and your own reluctance to provide an adequate dose of an opioid due to fear of future addiction or the thought that you are supporting "drug-seeking" behavior.

When used appropriately under medical supervision, hydrocodone, oxycodone, morphine, and similar prescription pain relievers provide indispensable medical benefit by reducing pain and suffering. However, these medications also have the potential to produce dependence or abuse, particularly when they are taken without a physician's direction and oversight (TEDS Report, 2010).

Nonmedical use of prescription pain relievers is a matter of increasing public health concern. In 2008, among the population of the United States aged 12 or older, nonmedical use of prescription pain relievers was the second most prevalent type of illicit drug use, after marijuana use (TEDS Report, 2010).

While this population may be difficult to treat for numerous reasons, withholding an opioid for pain relief should not occur. This may even cause the patient to seek their "old habits" to reduce pain. Instead, judicious assessment and monitoring of the patient's pain must be basis in which healthcare providers initiate and adjust pharmacologic therapies.

### **Test Yourself**

Withholding pain medication from a patient with a history of substance abuse will:

Be sensible nursing practice

Teach the patient to use non-pharmacological pain relief methods.

*Cause the patient to seek alternate drugs - Correct!*

### **Under-treatment of Pain**

There are still many myths and misbeliefs about the use of opioids and addiction which can lead to under-treatment of pain. This is particularly true of elderly patients, and those suffering from chronic pain. Unrelieved pain can lead to physical and psychological disruptions, including hormone fluctuation, electrolyte and glucose imbalance, hypertension, tachycardia, increased oxygen consumption, impaired intake and output, fatigue, depressed immune response, reduced cognitive function, insomnia, anxiety, depression, hopelessness, and thoughts of suicide (American Pain Society, 2007; CPM Resource Center, 2010a, 2010b, 2010c, 2010d).

### **Ethics of Pain Management**

As nurses, it is also important to remember that we have an ethical obligation to appropriately assess and treat patients' pain. Unfortunately, there are barriers to this, including underestimating the severity of a patient's pain, disregarding or disbelieving self-reports of pain, beliefs of "drug-seeking"

behavior, and fear of causing addiction or oversedation with patients.

### **Addressing Common Barriers**

**Fear of Addiction:** Many individuals do not understand the concept of addiction, which can include the patient, family member, and healthcare professional. In general, addiction can be described as the overwhelming need to obtain and use a drug for its psychic effects. It is not the need to use a drug for its medical benefit, particularly with acute pain. It is imperative that both the healthcare professional and the patient understand this concept. Patients are sometimes stoic and might not share their fears with healthcare professionals or even their families. Be proactive in discussing this common misconception with your patients and be secure in the knowledge that the appropriate medical use of pain medications very rarely, if ever, causes addiction.

**Fear of Opioid Tolerance and Physical Dependence:** Opioid tolerance can occur after repeated administration of any opioid substance. Tolerance to a drug occurs when an individual reports that the initial dosage of medication is no longer effective in managing the pain. Tolerance is not unusual and can often be expected with prolonged use of many types of pain medication. If tolerance does develop, the healthcare provider may wish to increase the dose, prescribe the same dose of the drug to be taken more frequently, or change the drug or route of administration. Physical dependence occurs when, after repeated administration of the drug, withdrawal symptoms appear when it is not taken. These symptoms include: anxiety, irritability, lacrimation (tearing), rhinorrhea (runny nose), cramps, nausea, vomiting, and insomnia

### **More Barriers**

**Fear of Respiratory Depression:** Respiratory depression related to opioid administration is a common fear among healthcare professionals. Morphine is the medication most commonly associated with this fear. Although a side effect of opioids is the possibility of respiratory depression, this is usually a gradual process and does not occur suddenly. Respiratory depression is more common in those who have not received opioids previously. Therefore, careful assessment is indicated during the initial doses of opioid administration. Respiratory depression is rare in patients that are on long-term opioid therapy because the respiratory system becomes tolerant to this effect. Auditory and physical stimulation are often effective in mild opioid-induced respiratory depression. Naloxone (Narcan) is the opioid antagonist that is usually administered to counteract the effects of an opioid overdose.

**Misconception that the Healthcare Provider Knows Best:** The patient is the only one that can fully describe his or her pain. The patient's self-report of pain is the standard by which healthcare professionals should base their pain assessments. Often the healthcare provider, families, and patients themselves believe that the provider knows or best understands the patient's pain. This is not true. The patient's reports of pain must be believed first and foremost. In situations when patients are not able to report their pain because of cognitive or motor abilities, pain must be assessed judiciously. Assessments should focus on changes in non-verbal behavior, vocalizations, changes in daily routines, and objective findings. The regular caregiver may also be a valuable resource in assessing pain in these individuals.

### **Principles of Pain Management**

Useful principles of pain management can be remembered with the "ABCDE method" as follows:

**Ask about pain regularly.**

**Believe the patient's and/or family's reports of pain**

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## **Choose appropriate pain approaches and treatment options**

## **Deliver interventions in a coordinated and timely fashion**

## **Empower patients and their families**

(American Pain Society, 2007; Denny & Guido, 2012; Health Care Association of New Jersey, 2011)

### **Conclusion**

Acute pain is a multifaceted symptom that must be accurately assessed to be managed successfully. Pain management is a vital component of patient care, and can be complex. It is important to individualize plan of care for each patient.

A thorough patient history and assessment should be conducted for all existing and new pain, recognizing that the patient is the best equipped to describe the pain.

Successful pain control is often achieved by providing both pharmacological and non-pharmacological therapies.

Healthcare professionals must actively participate in continuing to learn about new theories and techniques in pain management, and barriers must be addressed. We must be aware of those at risk for under-treatment of pain and current strategies in managing pain. Pain is a universal affliction and all healthcare providers must take initiative to appropriately manage pain and alleviate suffering.

### **Resources**

American Academy of Pain. Website: <http://www.painmed.org/>

National Institutes of Health. Website: <http://www.nih.gov/>

American Pain Society. Website: <http://www.americanpainsociety.org/>

American Pain Foundation. Website: <http://www.painfoundation.org/>

American Academy of Pain Management. Website: <http://www.aapainmanage.org/>

Institute for Clinical Systems Improvement. Website: <https://www.icsi.org/>

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