Learning Objectives

• To develop an understanding of the prevalence and consequences of under treatment of chronic pain
• To evaluate the benefits and limitations of existing and newer analgesic options in the management of chronic pain
• To gain knowledge of a variety of approaches to monitoring treatment response, managing adverse effects, and optimizing outcomes in pain patients
• To become familiar with the barriers to effective management of chronic pain, and employ strategies to overcome those barriers
• To gain knowledge of the respective roles of long-acting, short-acting, and rapid-onset opioids in the management of chronic pain

INTRODUCTION, PREVALENCE, AND DISEASE BURDEN
Pain: Perspectives and Definitions

- According to the International Association for the Study of Pain (IASP), pain is defined as “an unpleasant sensory and emotional experience which we primarily associate with tissue damage, or describe in terms of such damage, or both.”

Three Hierarchical Levels of Pain

<table>
<thead>
<tr>
<th>Component</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensory-Discriminative Component</td>
<td>Location</td>
</tr>
<tr>
<td></td>
<td>Intensity</td>
</tr>
<tr>
<td></td>
<td>Quality</td>
</tr>
<tr>
<td>Motivation-Affective Component</td>
<td>Depression</td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
</tr>
<tr>
<td>Cognitive-Evaluation Component</td>
<td>Thoughts concerning the cause and significance of the pain</td>
</tr>
</tbody>
</table>
Prevalence of Pain

- Pain is one of the most common reasons why patients present to medical providers, and one of the most prevalent medical complaints in the U.S.
- According to the National Center for Health Statistics Report, 1 out of 10 Americans have experienced pain that lasted longer than one year. Similarly 3 out of 5 Americans 65 and older have experienced pain lasting more than one year.
- Between 1988-94 and 1999-2002, the percentage of adults who took a narcotic to alleviate pain in the past month rose from 3.2% to 4.2%

Impact of Pain on the Healthcare System

- A 1998 National Institutes of Health (NIH) report concluded that the economic toll of pain may be estimated at upwards of $100 billion a year in the United States
- Patients with chronic pain have more hospital admissions, longer hospital stays, and unnecessary trips to the emergency department
- There are no current estimates of the total cost of poorly controlled pain in today’s dollars, however, according to NIH statistics, it is reasonable to estimate the annual cost of pain management to the healthcare system and society combined as equivalent to that of diabetes, which is $174 billion dollars annually


Societal Impacts of Pain

- Pain is associated with high utilization of healthcare, and the societal costs related to treatment are compounded by the loss in productivity associated with persistent pain.
- Loss of productivity in the workplace due to chronic pain is estimated to cost $61.2 billion dollars per year.
- The total annual cost of poorly controlled persistent pain most likely exceeds $100 billion dollars per year.


Pain: Perspectives and Definitions

- According to the American Medical Association “there is an important implication of both the IASP definition and the hierarchical model of pain: As a perception, pain may or may not correlate with an identifiable source of injury”
- Pain is often multi-factorial and complex. When pain becomes chronic, positive and negative adaptations and psychological issues add to the physiological and structural causes of the pain syndrome.

Because there is no objective indicator for pain, it is almost always best to believe that the patient is experiencing what is reported.
Classifications of Pain: Nociceptive

- Tissue injury activates primary afferent neurons called nociceptors, which are small diameter neurons found in the muscle, joints, and some visceral tissues.
- Nociceptive Pain is pain due to ongoing activation of the nociceptive system by tissue injury.

Classifications of Pain: Psychogenic vs. Idiopathic

**Psychogenic Pain**
- Pain which is sustained by psychological factors, and is subject to the specific diagnosis codified under the Somatoform Disorders in the Diagnostic and Statistical Manual of the American Psychiatric Association.

**Idiopathic Pain**
- When reasonable inferences about the sustaining pathophysiology of a pain syndrome cannot be made, and there is no positive evidence that the etiology is psychiatric, the pain should be labeled as “idiopathic.”
There is most commonly not a single source of chronic pain, but more often, a highly complex relationship consisting of multiple concurrent factors which are responsible for the origination and presentation of pain.

MANAGING TREATMENT: PAIN ASSESSMENT
Pain Management

- Because of the complicated factors involved in pain, the management of pain depends on a comprehensive assessment
- Psychosocial and psychiatric evaluations should be a fundamental part of any pain assessment, and are especially important in the management of persistent pain
- The process of assessment can be straightforward and brief in the setting of acute pain
- It increases in complexity and time required as the pain becomes persistent

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Acute Pain</th>
<th>Persistent Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal features</td>
<td>Recent onset and expected to last no longer than days or weeks</td>
<td>Remote, often ill-defined onset; duration unknown</td>
</tr>
<tr>
<td>Intensity</td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td>Associated affect</td>
<td>Anxiety may be prominent when pain is severe or cause is unknown; sometimes irritability</td>
<td>Irritability or depression</td>
</tr>
<tr>
<td>Associated pain-related behaviors</td>
<td>Pain behaviors (e.g., moaning, rubbing, splinting) may be prominent when pain is severe</td>
<td>May or may not give any indication of pain; specific behaviors (e.g., assuming a comfortable position) may occur</td>
</tr>
<tr>
<td>Associated features</td>
<td>May have signs of sympathetic hyperactivity when pain is severe</td>
<td>May or may not have vegetative signs such as: lassitude, anorexia, weight loss, insomnia, loss of libido; these signs may be difficult to distinguish from other disease-related effects</td>
</tr>
</tbody>
</table>
Initial Pain Assessment
Guidelines Overview

<table>
<thead>
<tr>
<th>Steps of the Initial Assessment</th>
<th>Crucial Components</th>
</tr>
</thead>
</table>
| Step 1: Obtain a detailed history | • Assessment of pain characteristics  
• Related concerns/comorbidities (physical and psychiatric)  
• Prior diagnosis and therapies |
| Step 2: Conduct a physical examination | • Emphasize the neurological and musculoskeletal examination |
| Step 3: Obtain and review past medical records and diagnostic studies | • Thorough review of past medical records  
• Thorough review of previous medications |
| Step 4: Develop a formulation including: | 1) Working diagnoses for the pain etiology, pain syndrome and inferred pathophysiology, and  
2) Plan of care including need for additional diagnostic studies and initial treatments for the pain and related concerns |

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Initial Assessment: Patient History

- A full patient history is a crucial component in the assessment of pain characteristics and should include the following:
  - Details from past medical history, which may reveal problems relating to the patient's pain (e.g., history of diabetes, toxic exposures, or alcoholism pointing towards a diagnosis of neuropathy), or disorders that would influence treatment decision making
  - A medication history, including: efficacy of treatment, any non-prescription drug use, medications recently stopped, dietary supplements, assessment of compliance, determination of all prescribers/pharmacies used, any barriers to treatment (problems paying for, obtaining, or taking medications)
Initial Assessment: Substance Use History

- Controlled prescription drugs, such as opioids, are an important part of pain management. In order to mitigate the risk for misuse and abuse a thorough understanding of the patient’s substance use history should be part of any initial assessment including:
  - Current use of tobacco and alcohol products
  - Specific questions about other drug use
    - Any positive response should elicit a series of follow up questions about frequency, and general use pattern as well as questions related to any efforts to obtain help in stopping
  - Family history of alcohol or drug abuse
    - This information is useful to stratify the risk of problems should the decision be made to offer a controlled prescription drug during the course of treatment

Initial Assessment: Day to Day Activities

- Gain a thorough understanding of the patient’s day to day activities including:
  - Sleep patterns
  - Impact of the pain on work and personal relationships
  - Present level of physical activity
  - Function, mood, and any other domains on the quality of life
Initial Assessment: Use of the Pain Diary

- A pain diary, or written daily record by the patient can be utilized over the course of treatment to give the provider a more comprehensive look at the course of the pain over treatment, and can also be beneficial in targeting an approach to pain management.

Initial Assessment: Physical Assessment & Diagnostic Eval.

- A physical examination should be done at the time of the initial pain assessment and repeated over time as required by the clinical situation
- The examination should include the following:
  - Mental status
  - Physical inspection (posture, guarding, splinting, signs of sympathetic dysfunction)
  - Vital signs
  - Neurological assessment
- A diagnostic evaluation should be performed when a diagnosis is lacking, and when the test will yield meaningful and actionable information (such as a change in treatment)
MANAGING TREATMENT: PAIN ASSESSMENT TOOLS

Importance of Quantifying Pain

- Quantifying pain is an essential part of any ongoing pain assessment
- There are a variety of pain assessment tools available
- The clinician should select a pain assessment tool, and incorporate that tool into routine clinical use making sure that the following occurs:
  - The tools is used in a standardized way
  - The tool is systematically utilized across the organization
Essential Of Any Pain Management Tool

- Whether simple or complex the pain management tool that you utilize should include the following information:
  - Time frame of the pain
  - Clinical context of the pain
  - Average intensity over a fixed period of time
- Additionally pain management tools can be used to provide information of the course of pain over time by asking the following questions:
  - What is your pain “on average”
  - What is your pain “at its worst”
  - What is your pain “at its least”
- The choice of a pain scale may vary depending on patients age, abilities, and other factors

Unidimensional Pain Scales

- Numeric Rating Scale- a simple to use rating scale that can work both in the clinical setting, and at home by the patient to quantify and keep track of pain.
- This scale can effectively be utilized to clarify the relationship between pain and activity, the effectiveness of current pain treatment
Unidimensional Pain Scales

Visual Analog Scales are another way to approach pain measurement and are similar to the NRS system. Because the measurement is linear, it allows further expression of pain, not limiting the pain to 10 “discreet levels of intensity.”

Pictorial pain scales—pictorial pain scales can be especially useful for pediatric patients, for patients with cognitive barriers, and for patients who may have language barriers.
Multidimensional Pain Scales

- The McGill Pain Questionnaire (MPQ) is a multidimensional clinical tool that assesses pain in 3 dimensions:
  1. Sensory
  2. Affective
  3. Evaluative

- Brief Pain Inventory (BPI), is a measurement tool taking 5-15 min. to administer.
  - The BPI Includes:
    - 7 intensity scales
    - 7 scales assessing impact of pain
Treatment Outcomes of Pain Survey

• Treatment Outcomes of Pain Survey (TOPS) is an instrument useful for the assessment of persistent pain. TOPS additionally allows for the tracking of large numbers of patients in key functional domains, but lacks the sensitivity to determine individual patient changes.

• TOPS is currently useful for research purposes, and could potentially be adopted for individual clinical practices

TREATMENTS AND GUIDELINES
Goals of Treatment

- Goals of treating pain vary from patient to patient

### Acute Pain
- Reduce Pain intensity as quickly as possible

### Persistent Pain (cancer related)
- Goal of comfort
- Relief of other symptoms
- Management of comorbidities

### Persistent Pain (non cancer related)
- Decrease pain intensity
- Relief of other symptoms
- Management of comorbidities
- Functional restoration

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Categories of Analgesic Strategies

<table>
<thead>
<tr>
<th>Type of Analgesic Strategy</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacologic</td>
<td>Nonopioid drugs</td>
</tr>
<tr>
<td></td>
<td>Opioid drugs</td>
</tr>
<tr>
<td></td>
<td>Adjuvant analgesics</td>
</tr>
<tr>
<td>Rehabilitative</td>
<td>Physical and occupational therapy Modalities (heat, cold, ultrasound, electrical stimulation)</td>
</tr>
<tr>
<td>Psychological</td>
<td>Cognitive-behavioral therapy</td>
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<tr>
<td></td>
<td>Specific treatments (e.g., biofeedback)</td>
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<tr>
<td></td>
<td>Other types of psychotherapy</td>
</tr>
<tr>
<td>Interventional</td>
<td>Injection therapy</td>
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<tr>
<td></td>
<td>Neural blockade</td>
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<td></td>
<td>Implant therapies</td>
</tr>
<tr>
<td>Surgical</td>
<td>Neurectomy, nerve decompression, cordotomy</td>
</tr>
<tr>
<td>Complimentary and Alternative</td>
<td>Acupuncture, massage, chiropractic, nutraceuticals, energy therapies, non-Western medicine</td>
</tr>
</tbody>
</table>
Pharmacologic Treatment: Nonopioid drugs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Examples</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin and other</td>
<td>Aspirin, Anacin, Dolobid,</td>
<td>Provides effective relief of many</td>
</tr>
<tr>
<td>Salicylates</td>
<td>Doan’s caplets, Saiflex</td>
<td>types of acute pain, including</td>
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<td></td>
<td></td>
<td>somatic pain, as well as trauma</td>
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<tr>
<td></td>
<td></td>
<td>related pain, dental pain, and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>postoperative pain</td>
</tr>
<tr>
<td>NSAIDS</td>
<td>Clinoril, Cataflam, Lodine,</td>
<td>Have ability to inhibit the</td>
</tr>
<tr>
<td></td>
<td>Nalfon, Advil, Indocin,</td>
<td>synthesis of prostaglandins</td>
</tr>
<tr>
<td></td>
<td>Actron, Ketorolac, Meclomen,</td>
<td>through their inhibition of COX</td>
</tr>
<tr>
<td></td>
<td>Ponstel, Aleve</td>
<td>enzymes in peripheral tissue.</td>
</tr>
<tr>
<td>COX-2 Inhibitors</td>
<td>Celebrex</td>
<td>COX-2 inhibitors which work by</td>
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<tr>
<td></td>
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<td>stopping the body’s production</td>
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<td></td>
<td></td>
<td>of a substance that causes pain and</td>
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<td></td>
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<td>inflammation. Used most</td>
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<td>commonly for osteo and</td>
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<tr>
<td></td>
<td></td>
<td>rheumatoid arthritis</td>
</tr>
</tbody>
</table>

Pharmacologic Treatment: Opioid Analgesics

- Opioids produce analgesia by action on both central and peripheral opioid receptors to inhibit the transmission and perception of nociceptive input
- They can be classified by their action:
  - Full agonist
  - Partial agonist
  - Mixed agonist-antagonist
  - Antagonist
Opioid Differentiation

Short Acting Opioids (SAOs)
- Duration of action is 2-4hrs
- Utilized in patients whose pain occurs for only a few periods throughout the day
- Available as a single entity medication or in combination with a non-opioid, such as acetaminophen

Long Acting Opioids (LAOs)
- Recommended to control pain around the clock in patients with consistent pain levels
- In general, LAOs are sustained release formulations of SAOs
- SAOs can be added as needed to the baseline regimen

Rapid Onset Opioids (ROOs)
- Designed as a rescue medication for sudden, severe pain flares that occur against a backdrop of well controlled baseline pain
- Include oral transmucosal fentanyl citrate, fentanyl buccal tablets, and fentanyl soluble film
- Long term efficacy and risk of abuse not known

Pharmacologic Treatment: Opioid Analgesics

<table>
<thead>
<tr>
<th>Agent</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>Severe acute pain (trauma, post-op, MI) or persistent pain</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>Pain management when opioid therapy is appropriate. Moderate to severe pain (trauma, MI, surgery, burns, renal colic, biliary colic, cancer)</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>Transdermal: persistent pain, Oral transmucosal: breakthrough pain, Parenteral: acute severe pain</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>Moderate to moderately severe pain (trauma, post-op, dental, cancer, etc.) CR for moderate to severe pain if opioid is required for extended time</td>
</tr>
<tr>
<td>Oxymorphine</td>
<td>Moderate to severe acute pain, CR for moderate to severe pain if opioid required for extended time</td>
</tr>
<tr>
<td>Meperidine</td>
<td>Moderate to severe pain (migraine, trauma, post op, and acute abdominal pain</td>
</tr>
</tbody>
</table>

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Pharmacologic Treatment: Adjuvant analgesics

**Indication** | **Examples**
--- | ---
Multiple types of pain syndrome | Corticosteroids  
 Tricyclic antidepressants  
 Selective SNRIs  
 Alpha 2 adrenergic agonists  
 Topical therapies

Neuropathic pain | Antiepileptic agents  
 NMDA receptor antagonists  
 Oral sodium channel blockers

Complex regional pain syndrome or suspected sympathetically maintained pain | Calcitonin  
 Clonidine  
 Prazosin

Bone pain from cancer | Bisphosphonates (e.g., pamidronate)  
 Calcitonin  
 radiopharmaceuticals

Rehabilitative Treatment

- Specific treatment is usually considered under the purview of physical medicine or rehabilitation may be prescribed as part of a CBT program, or separately.
- Some patients with acute pains, should be given specific instructions for exercise, or referral to a physical therapist, as a first-line approach to pain therapy with functional restoration.
- Additional programs may be available through hospitals, free-standing facilities, government services or corporate entities including vocational assessment and training, job retraining programs, work hardening programs, and rehabilitation-orientated pain management programs.
Psychological Treatment

- Psychological interventions usually are subsumed under the broad framework of cognitive-behavioral therapy
- Included in this approach are strategies that can be taught to the patient and may lessen pain intensity, improve coping, increase function, and reduce overall disability
- These strategies include education about pain and its impact; cognitive strategies to reduce catastrophization and helplessness
- Training in cognitive therapies such as biofeedback, relaxation and imagery; and specific behavioral interventions such as graduated exercises, pacing and time management and sleep hygiene training

Principles of Pain Control and Analgesic Therapy

- Integrate analgesic interventions into a comprehensive evaluation and management plan
- Assess and manage disability and physical, psychosocial and psychiatric comorbidities as part of the approach to pain management
- Identify and treat the source of pain, if possible and appropriate
- Individualize analgesic therapies and do not use placebo
- Select the simplest approaches but recognize the value of a multimodality approach that uses pharmacologic and nonpharmacologic therapies
- Use analgesic drugs rationally, based on a case by case analysis of benefit and risk
- Obtain the input of consultants if there is uncertainty about the value of specific drug therapies
Treatment a multi-modality combined approach

- In many cases, particularly those characterized by persistent pain, recurrent pain, a high level of associated disability, or a prior poor response to analgesics can benefit through a multimodality strategy.
- Collaborative Team Approach between Clinicians and Case Managers and/or Care Managers is essential.

APS and AAPM Guidelines: Managing Chronic Non-cancer Pain

<table>
<thead>
<tr>
<th>Conduct a comprehensive evaluation, including risk assessment</th>
<th>Periodically reassess patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counsel patient and obtain informed consent</td>
<td>Anticipate, identify, and treat opioid-associated adverse events</td>
</tr>
<tr>
<td>Individualize treatment</td>
<td>Integrate non-opioid therapies as adjunctive treatment</td>
</tr>
<tr>
<td>Evaluate potential causes for repeated dose escalations; wean or taper off if necessary</td>
<td>Consider as-needed therapy for breakthrough pain</td>
</tr>
</tbody>
</table>

Chou, r., et al. J Pain. 2009;113-130

APA = American Pain Society
AAPM = American Academy of Pain Medicine
The Four “A’s” of Pain Treatment Outcomes

- Analgesia (Pain Relief)
- Activities of daily living (psychosocial functioning)
- Adverse effects (side effects)
- Aberrant drug taking (addiction-related outcomes)

BARRIERS TO EFFECTIVE PAIN MANAGEMENT AND MEANS OF OVERCOMING THEM
Clinician Barriers to Opioid Prescribing

- Lack of education about opioids and current standards for pain management
- Fear of toxicity
- Fear of addiction
- Fear of being “had” or “scammed”
- Fear of regulatory agency scrutiny

Overcoming Clinician Barriers

- Education on the part of the Clinician is the key to overcoming barriers
- Clinicians must actively develop a knowledge of the pharmacology of Opioid analgesics, including:
  - Relative potency
  - Pharmacokinetics
  - Pharmacodynamics
  - Formulation differences; and
  - Possible drug interactions
- Clinicians need to be aware of personal biases that interfere with clinical judgment
Overcoming Clinician Barriers

- Clinicians must be able to differentiate between the disease of addiction and the pharmaco-behavioral phenomena of physical dependence, tolerance, and pseudo-addiction.
- Clinicians must be able to recognize aberrant drug-related behaviors and formulate a differential diagnosis to identify, prevent, or treat medication misuse, abuse, and inadequate treatment.
- Clinicians must develop the belief that pain management is important, and be able to incorporate pain treatment guidelines into routine medical practice.

Patients Barriers to Opioid Treatment

- Fear of focusing on symptoms rather than cause
- Belief that pain is inevitable
- Fear of Adverse Effects
- Fear of Addiction
- Racial and Ethnic Disparities in Pain Treatment
Overcoming Patient Barriers to Treatment

- Knowledge and patient outreach should be conducted to educate patients about chronic pain, and change the perception that it does not warrant treatment.
- Both symptoms and causes should be addressed, and clinicians should support this approach.
- Fear of adverse effects and of addiction can be overcome through outreach allowing the population to become more educated regarding the benefits of pain management, and the clinical safe-guards to patients which eliminate or reduce these factors.
- Clinicians should educate themselves regarding chronic pain in both Hispanic and African American populations and should incorporate cross cultural training and education into their practice.

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