به نام خالق فالق هستی بخش
Pain Is a Fifth Vital Sign
درد یک احساس ناگوار است که به وسیله ی محرک زیان آورایجاد می شود و هدف آن اساسا دفاع و محافظت است.
درد یک احساس ذهنی است که در اثر محرک های مضر در طبیعت ایجاد می شود و یکی از عمومی ترین علائم ناراحتی در افراد است.
Pain is a more terrible lord of mankind than death itself

Albert Schweitzer
Define Pain

• An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.

  – (International association for the study of pain 1979)
Define Pain

✓ Pain is whatever the experiencing person says it is

✓ May not be directly proportional to amount of tissue injury

✓ Highly subjective, leading to undertreatment
Pain is the most common complaint for which individuals seek medical attention!
PAIN PHYSIOLOGY

Process of pain physiology

nociceptor

TRANSDUCTION

TRANSMISSION

PERCEPTION

MODULATION
• The process of pain
  – Transduction
  – Transmission
  – Perception
  – Modulation
Pain physiology contd..

- Pain stimuli is converted to electrical energy. This electrical energy is known as Transduction. This stimulus sends an impulse across a peripheral nerve fiber (nociceptor).
Afferent Peripheral Receptors

• Superficial
  – Warm/cold, touch, pressure, itch and pain from skin level

• 3 categories
  ✓ Mechanoreceptors
  ✓ Thermoreceptors
  ✓ Nociceptors
Nociceptors

• Transmit pain impulses
• Described as free nerve ending
• Stimulated by:
  – Mechanical
  – Chemical
  – Thermal
  – Nociceptors- specialized nerve endings that respond to painful stimuli
انواع محرك‌های درد

فعال کننده‌های گیرنده‌های درد حسی درد:

- گیرنده‌های درد سریع
- گیرنده‌های درد سریع مکانیکی
- حرارتی
- شیمیایی

گیرنده‌های درد آهسته

- مکانیکی
- حرارتی
- شیمیایی
Pain nerve fibers

- From the pain receptors, the pain stimulus is transmitted through peripheral nerves to the spinal cord and from there to the brain. This happens through two different types of nerves fibers:
  - A-delta "fast pain"
  - C-fibers “slow pain” nerve fibers
“fast pain”

✓ “fast pain” sensation-is experienced as sharp. (myelinated fibers)

✓ Occurs after a short time (at a speed of five to 30 meter/second)

✓ This is all to make the body withdraw immediately from the painful and harmful stimulus, in order to avoid further damage
“slow pain”

✓ “slow pain”, more a dull and burning. (non-myelinated fibers)

✓ lasts a few seconds or minets (speed of less than 2 meters per second)

✓ Body response - immobilization (guarding, spasm or rigidity), so that healing can take place.
مسیر درد

1. تحريك گیرنده های حسی درد

2. انتقال پیام درد به نخاع از طریق فیبرهای میلین مایل دارو بدون میلین

3. آزاد شدن میانجی های شیمیایی از الیاف آوران نخاعی و افزایش حساسیت گیرنده های حسی درد

4. انتقال درد از نخاع به مغز از دو مسیر زیر:
   - مسیر نئواسپینوتالامیک
   - مسیر پالیواسپینوتالامیک
مسیر نئواسپینوتالالامبیک به لامینای ۱ در شاخ خلفی نخاع ختم A-Delta فيبرهای شده و باعث تحریک نورون های رده دوم این مسیر می شود که از طریق رابط قدامی به سمت مقابل نخاع رفته و از طریق ستون های قدامی طرفی به سمت مغز میرود تعدادی به نواحی مشبک مغز اکثرا به تالاموس
مسیر پالئواسپینوتالامیک

• عمدتاً فیبرهای نوع C
• لامینای ۲ و ۳ در شاخ خلفی
• عبور از طریق رابط قدامی به سمت مقابل نخاع
• عبور از طریق رابط قدامی به سمت مقابل نخاع
• مسیر قدامی به سمت مغز و کورتکس مغز
Transmission by primary A-delta and C-fibres
مواد موثر بر انتقال محرك عصبی مانند: هیستامین-برادی کینین- استیل کولین و ماده P انتقال ودرک حس درد را افزایش می‌دهند.

تعیید کننده های عصبی مانند: آندروفین ها و آنکفالین ها انتقال ودرک حس درد را کاهش می‌دهند.
Neurophysiology of pain (excitatory)

• **Bradykinin** - most potent pain producing chemical

• **Prostaglandins** - increase sensitivity to pain experience. Is a potent vasodilator and increase the production of bradykinin resulting edema
Neurophysiology contd..

- **Substance P** - transmits pain impulses to brain centers and causes vasodilatation and edema

- **Serotonin** - causes pain by altering sodium flow—neuron to fire

- **Histamine, Leukotrienes and nerve growth factor** are released
What is the initial response to pain stimulus?

- Pain stimulus
- Release chemical mediators
- Bradykinin
- Prostaglandins
- Substance P
- Develop Primary Hyperalgesia
- Develop Secondary Hyperalgesia
Pathophysiology of Pain

Nociceptor Stimulate

K  Substance P  Bradycinin  Prostaglandin

Cyclooxygenase

Arachidonic acid

Phospholipase

Phospholipid
The Neural Pain Pathway

Pain-sensing neurons, "nociceptors", are stimulated by:

- Force
- Heat
- Cold
- Chemicals
FIG. 13-3. Spinal cord and CNS pathway. Stimuli are transmitted from pain receptors through sensory nerves into the dorsal root ganglia. The impulse enters the spinal cord, forms a synapse, crosses the cord, and rises to the spinothalamic tract.
Pain physiology contd..

Transmission:

• A delta fibers (myelinated) send sharp, localized and distinct sensations.

• C fibers (unmyelinated) relay impulses that are poorly localized, burning and persistent pain.

• Pain stimuli travel- spinothalamic tracts.
Pain physiology contd..

Perception:

• Person is **aware of pain** – somatosensory cortex identifies the **location and intensity of pain**

• Person unfolds a **complex reaction** - physiological and behavioral responses is perceived.
Modulation:

- **Inhibitory neurotransmitters** like endogenous opioids work to hinder the pain transmission.
- This *inhibition of the pain impulse* is known as modulation.
Neuromodulators (inhibitory)

Endorphins & dynorphins - morphine like substances.

- Located in the brain, spinal cord

- Produce analgesia when attached with opiate receptors in the brain
FIG. 13-5. Descending pathway and endorphin response. The biologic receptors of the enkephalins and endorphins are located close to known pain receptors in the ascending and descending pain pathways.
آسیب سلولی توسط محرک‌های شیمیایی، الکتریکی، حراری و مکانیکی تولید می‌شود که برادری کینین و یا هیستامین، پروستاگلاندین را تولید می‌کند. انتقال پیام عصبی درد توسط فیبرهای بدون میلین نوع c و فیبرهای میلین دار نوع A-دلتا شاخ خلفی نخاع از طریق انتقال به اعصاب نخاعی تالاموسی آزاد شدن ماده P تقاطع در طناب نخاعی و انتقال به مغز یا تفسیر می‌شود.
نظریه کنترل دریچه ایی درد

- یک مکانیسم دریچه ایی که محل آن در سلول های زلاتینی شاخ خلفی نخاع است ورود تکانه های درد به مسیرهای عصبی عصبی را کنترل می کند
- این تئوری در ارتباط با انتقال محرک و رابطه بین درد و احساسات است
- تارهای با قطر کوچک باعث تشديد انتقال جریان درد به مغز و تارهای با قطر بزرگ انتقال جریان از طنان نخاعی به مغز را مهار می کنند
- عواملی از قبیل توجه، تفکر،دقت و احساسات: منجر به کاهش یا افزایش پیام های مربوط به درد می شود
نظریه اختصاصی درد

این نظریه بر اساس نظریه دکارت در مورد فرآیند ایجاد درد شکل گرفت که بر پایه آن سیستم ویژه‌ای از اعصاب (گیرنده‌های درد) پیام‌ها را از گیرنده‌های درد در پوست به مراکز درد در مغز انتقال می‌دهند. نظریه‌های اختصاصی درد اعتقاد دارند که بین ساختار عصبی و تجربیات روان شناختی درد ارتباط متقابل وجود دارد. تحقیقات اخیر با استفاده از عصب‌نگاری نشان می‌دهد که این ارتباط بیشتر ساده‌انگارانه است
نظریه کنترل دروازه درد

اولین بار نظریه کنترل دروازه درد توسط ملزاق و وال (۱۹۶۵) در مقاله مشهور مکانیزمهای درد: این نظریه روبرویکرد پزشکی نظریه‌های قبلی را با مدل‌های اخیر زیستی، روانی، اجتماعی سلامت تلفیق کرد. این روبرویکرد تنها به عوامل پزشکی قناعت نمی‌کند، بلکه تغییر بین عوامل زیستی، روان‌شناختی و اجتماعی را مورد توجه قرار می‌دهد. این نظریه مطرح می‌کند که یک دروازه در سیستم عصبی وجود دارد. این دروازه در مقابل محرک‌های درد باز و بسته می‌شود. (تسرهکن درد از طریق ماساژ محل درد)
نظریه کنترل دروازه درد

باز شدن دروازه به پیام‌های عصبی اجازه می‌دهد تا به مغز ارسال شوند و بستن دروازه رفتین پیام‌ها به مغز را متوقف می‌سازد. فعالیت در تارهای درد موجب می‌شود که سلول‌های انتقال انتقال دهنده تیکه‌های علائم درد را به سوی مغز بفرستند و دروازه را باز کنند. فعالیت در اعصاب حسی که بطور مستقیم با درد بی‌ارتباط است موجب می‌شود که، اعصاب با قطر بزرگ‌تر اطلاعات مربوط به حس‌های ضرر و زیان‌آور را حمل کنند (تیماس، مالیدن و خارنیان، 1999).

این فعالیت‌ها دروازه را می‌بندد و احتمال تجربه درد را کاهش می‌دهد و به این دلیل است که مالیدن پاییز می‌کند می‌تواند درد را تسکین دهد. خود پیام‌هایی که از مغز می‌آیند نیز می‌تواند دروازه را باز یا بسته کند. این نظریه بیان می‌کند که درد یک دو راهی جریان اطلاعات به مغز و از مغز است و این که نه تنها مغز این اطلاعات را پردازش می‌کند، بلکه بطور مستقیم در مکانیزم دروازه‌ای تاثیر می‌گذارد. هر چند ماهیت کارهای مکانیزم دروازه در حال حاضر روش‌شناسی و تحقیقات بیشتری در این زمینه مورد نیاز است. شکل زیر فرآیند ایجاد درد را در نظریه کنترل دروازه‌ای نشان می‌دهد.
مفهوم اصلي درد
Components of Pain

- Physiological
- Behavioral
- Sensory
- Cognitive
- Affective
Consequences of Pain

**Direct Effects**
- Respiratory disorders
- Immobility, deconditioning
- Immune dysfunction
- Nerve sensitization
- Insomnia
- Lowered quality of life
- Morbidity / mortality

**Stress Response**
- Cardiovascular effects
- Metabolic anomalies
- Endocrine dysfunction
- Inflammatory responses
- Immune suppression
- Perceptual changes
- Anxiety / mood disorders
- Neurological changes
آستانه درد کمترین دردی است که یک فرد قادر به تشخیص آن باشد.

آستانه درد اختصاصی است و می‌تواند وابسته به عوامل زیر باشد:

- جنس / سن
- فرهنگ
- تفاوت‌های شخصیتی
- شرایط روانی / فیزیولوژیک

Pain is a blessing from God
Factors Affecting Pain Threshold

<table>
<thead>
<tr>
<th>Threshold ↓</th>
<th>Threshold ↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discomfort</td>
<td>Relief of other symptoms</td>
</tr>
<tr>
<td>Insomnia</td>
<td>Sleep</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Sympathy</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Understanding</td>
</tr>
<tr>
<td>Fear</td>
<td>Companionship</td>
</tr>
<tr>
<td>Anger</td>
<td>Creative Activity</td>
</tr>
<tr>
<td>Sadness</td>
<td>Relaxation</td>
</tr>
<tr>
<td>Depression</td>
<td>↓ Anxiety</td>
</tr>
<tr>
<td>Boredom</td>
<td>↑ Mood</td>
</tr>
<tr>
<td>Mental Isolation</td>
<td>Analgesics</td>
</tr>
<tr>
<td>Social abandonment</td>
<td>Anxiolytics</td>
</tr>
<tr>
<td></td>
<td>Antidepressants</td>
</tr>
</tbody>
</table>
شدید ترین دردی که برای فرد قابل تحمل تحمل باشد

عوامل موثر:
- فیزیکی
- باورها/اعتقادات
- شرایط روانی/سطح سازگاری روانی
Pain categories

1. Somatogenic pain is pain with cause (usually known) localised in the body tissue
   a/ nociceptive pain
   b/ neuropatic pain

2. Psychogenic pain is pain for which there is no known physical cause but processing of sensitive information in CNS is disturbed
Major Categories of Pain

Classified by inferred pathophysiology:

1. **Nociceptive pain** (stimuli from somatic and visceral structures)

2. **Neuropathic pain** (stimuli abnormally processed by the nervous system)
Classification of Pain

Nociceptive Pain
- Pain pathways intact
  - Somatic
  - Visceral

Neuropathic pain
- Anatomical or functional abnormality of pain pathway in area of abnormal sensation
The classification of pain

- classification by location
- classification by time course:
  - acute pain
  - chronic pain
- classification by underlying pathology:
  - non-cancer
  - cancer
- classification by pain intensity
Types of Pain

1. Acute
2. Cancer
3. Chronic non-malignant
Responses to acute pain

- increased heart rate
- increased respiratory rate
- elevated blood pressure
- pallor or flushing, dilated pupils
- diaphoresis
- ↑ blood sugar
- ↓ gastric acid secretion
- ↓ gastric motility
- ↓ blood flow to the viscera, kidney, and skin
- nausea
- ↓ blood flow to the
- viscera kidney and skin
- nausea
two types of acute pain:

1. Somatic
   pain is superficial coming from the skin or close to the surface of the body.

2. Visceral
   Somatic Visceral pain refers to pain in internal organs, the abdomen, or chest.
   – referred
   Referred pain is pain that is present in an area removed or distant from its point of origin. The area of referred pain is supplied by the nerves from the same spinal segment as the actual site of pain.
Quality: Somatic pain

- **Descriptors:** aching, deep, dull, gnawing

- **Distribution/Examples:**
  - Well localized—patients can often point with one finger to the location of their pain
    - bone mets, strained ankle, toothache
• Visceral pain:

  Types - angina pectoris, myocardial infarction, acute pancreatitis, cephalic pain, prostatic pain, nephrololytiatic pain

• Receptors: unmyelinated C - fibres
Quality: Visceral Pain

Descriptors: cramping, squeezing, pressure

Distribution/Examples:
- Referred
  - heart attack, kidney stone
- Colicky
  - Bowel obstruction, gallstone
- Diffuse
  - Peritonitis
Types of pain: chronic pain

Chronic
Involves both physical and emotional components. Rarely indicates ongoing damage. Nervous system is disrupted or damaged. The pain is neuropathic, that is inappropriate response caused by a primary lesion or dysfunction in the nervous system.

Description: burning, shooting, stabbing, cramp, numbness.
Acute pain

- Relatively brief duration (hours to weeks)
- Etiology often known (e.g. surgery, trauma, disease)
- Pain proportionate to cause
- Often some objective sign (e.g., groaning) with transient adrenergic response (>BP, HR)
- Anxiety, anger, fear common

Chronic pain

- Longer in duration (months to years)
- May not be associated with known illness or injury
- Pain ~disproportionate to etiology (maybe unknown)
- Often no objective sign
- Depression is common
Types of pain

Cancer related pain

- Because of tumor growth, toxic effects of chemotherapy, or radiation
عوامل موثر بر درد

• متغیرهای روانی
  - شخصیت
  - تجربه ی قبلی درد
  - تصویر بدنی
  - کنترل درد
  - اضطراب
  - درد پیش بینی شده
عوامل موثر بر درد

• متغیر های فیزیولوژیک
  - جنس: زنان بیش از مردان احساسات نشان می‌دهند
  - سن
  - ترتیب تولد

• متغیر های فرهنگی-اجتماعی
  - شناخت و آگاهی
  - مذهب
  - محيط
درد خیالی در عضو از دست داده شده این دردها احساس می‌شود.

دارای 4 خصوصیت:

- تا مدتی که پس از التیام قسمت قطع شده و جود دارد
- در اثر تحریکات سایر نقاط بدن ایجاد می‌شود
- امکان بروز در افرادی که قبل از قطع عضو درد شدید داشته‌اند بیشتر است
- ممکن است به صورت واقعی بروز نماید
Pain Assessment
Collection of Historical Data

PERSONAL HISTORY

A. General Information
B. Education.
C. Occupation
D. Current Employment Status
E. Marital Status
F. Marital Relationship Rating
G. Family Environment
H. Ethnic Origin
I. Religious Belief
PAIN HISTORY

A. Site of Pain
B. Pain Drawing
C. Duration
D. Place of Onset
E. Pain Characteristics
F. Response of Pain to Activity
G. Associated Symptoms
MANAGEMENT HISTORY

A. Prior Treatment
B. Prior Surgery
C. Medications
D. Review of Systems Checklist
E. Diagnostic Tests
A. Alcohol Use
Assess the degree of use/abuse and whether alcohol is used to relieve the patient's pain. Any type of substance abuse poses a serious barrier to successful treatment.

B. Smoking History
Certain disorders, particularly vasospastic problems, may be aggravated by tobacco.
Physical Examination of the Patient Experiencing Pain

A. Reviewing Patient History
B. Examination Protocol
C. Observing Patient Affect
D. Musculoskeletal Examination
E. Neurologic Examination
Psychological Assessment of Patients Experiencing Pain

A. Pain
B. Effects of Pain Experience
C. Family Functioning
D. Educational and Work History
E. History of Psychological Functioning and Past Treatment
F. Current Psychological Functioning
BEHAVIORAL RESPONSES
• OBJECTIVE DATA
  – Check Vital signs
  – Pallor
  – Pupil dilation
  – Diaphoresis
  – Gastric distress, Nausea and vomiting, Anorexia
  – Fatigue
  – Withdrawal
  – Note for any physical expressions of pain
    • grimace face, frowning, rubbing, splinting, guarding, immobilizing,
    • evoke emotional responses: depression, anger, fear, anxiety, sadness, excitement, denial, regression
    • elicit vernal responses: moaning, screaming, crying, repetition of words or phrases
PAIN ASSESSMENT
SUBJECTIVE DATA

- Comprehensive pain history includes COLDERR
  - Character
  - Onset
  - Location
  - Duration
  - Exacerbation
  - Relief
  - Radiation
Pain Assessment

• **P** recipitating/Alleviating Factors:
  – What causes the pain? What aggravates it? Has medication or treatment worked in the past?

• **Q** uality of Pain:
  – Ask the patient to describe the pain using words like “sharp”, dull, stabbing, burning”

• **R** adiation
  – Does pain exist in one location or radiate to other areas?

• **S** everity
  – Have patient use a descriptive, numeric or visual scale to rate the severity of pain.

• **T** iming
  – Is the pain constant or intermittent, when did it begin, and does it pulsate or have a rhythm
Methods of Pain Assessment

• **Verbal Analog Scale:**
  - *Numeric Scale*
    - Residents rate their pain on a scale of 1-10, with “0” used for no pain & “10” for the worst pain
  - *Verbal Scale*
    - Use adjectives such as “mild”, “moderate” and “severe”

• **Visual Analog Scale:**
  - Drawings of faces in various levels of pain (see attached handout)
Pain Assessment Tools: Wong-Baker

Explain that "Face 0" is very happy because he does not hurt at all. "Face 2" hurts just a little bit. "Face 4" hurts a little more. "Face 6" hurts even more. "Face 8" hurts a whole lot. "Face 10" hurts as much as you can imagine, although you do not have to be crying to feel this bad.

d. 13 years to adult / geriatric = Use the "Numeric Pain Intensity Scale".
## Pain Assessment Tools:  
Non-Verbal Pain Scale (FLACC)

<table>
<thead>
<tr>
<th>Categories</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face</strong></td>
<td>No particular expression or smile</td>
<td>Occasional grimace, tearing, frowning,</td>
<td>Frequent grimace, tearing, frowning,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wrinkled forehead</td>
<td>wrinkled forehead</td>
</tr>
<tr>
<td><strong>Activity</strong> (movement)</td>
<td>Lying quietly, normal position</td>
<td>Seeking attention through movement or</td>
<td>Restless, excessive activity and/or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>slow, cautious movement</td>
<td>withdrawal reflexes</td>
</tr>
<tr>
<td><strong>Guarding</strong></td>
<td>Lying quietly, no positioning of hands</td>
<td>Splinting areas of the body, tense</td>
<td>Rigid, stiff</td>
</tr>
<tr>
<td></td>
<td>over areas of body</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physiology</strong> (vital signs)</td>
<td>Stable vital signs</td>
<td>Change in any of the following:</td>
<td>Change in any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- SBP &gt; 20mmHg</td>
<td>- SBP &gt; 30mmHg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- HR &gt; 20/minute</td>
<td>- HR &gt; 25/minute</td>
</tr>
<tr>
<td><strong>Respiratory</strong></td>
<td>Baseline RR/SpO₂, Compliant with</td>
<td>RR &gt; 10 above baseline, or 5% ↓SpO₂,</td>
<td>RR &gt; 20 above baseline, or 10% ↓SpO₂,</td>
</tr>
<tr>
<td></td>
<td>ventilator</td>
<td>mild asynchrony with ventilator</td>
<td>severe asynchrony with ventilator</td>
</tr>
</tbody>
</table>

**Abbreviations:** HR = heart rate; RR = respiratory rate; SBP = systolic blood pressure; SpO₂ = pulse oximetry.  
**Instructions:** Each of the 5 categories is scored from 0-2, which results in a total score between 0 and 10. Document total score by adding numbers from each of the 5 categories. Scores of 0-2 indicate no pain, 3-6 moderate pain and 7-10 severe pain. Sepsis, Hypovolemia, hypoxia need to be excluded before interventions.
Assessment Cognitively Intact

Comprehensive Pain Assessment Form
Cognitively Intact

Resident Name ___________________________ ID # ___________ Room # ___________
Assessment Date ___________ Time ___________ Physician ___________

<table>
<thead>
<tr>
<th>Residents Pain Control Goal</th>
<th>Residents Pain Intensity Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Sleep comfortably</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>□ Comfort at rest</td>
<td></td>
</tr>
<tr>
<td>□ Comfort with movement</td>
<td></td>
</tr>
<tr>
<td>□ Total pain control</td>
<td></td>
</tr>
<tr>
<td>□ Stay alert</td>
<td></td>
</tr>
<tr>
<td>□ Perform desired activities</td>
<td></td>
</tr>
<tr>
<td>□ Other:</td>
<td></td>
</tr>
</tbody>
</table>

(Check the correct rating)

Current Pain-related Diagnosis(es):
Reason for Assessment: □MDS Admission □MDS Significant Change □MDS Readmission
□MDS Quarterly □MDS Annual □New Condition □Routine Monitoring
Type of Pain: □Noxious □Noxious (Joint/bone/soft tissue) □Neuropathic □Mixed
Depression (yes/no): ______ Depression Scale and Score: ______ Date: ______

Intensity of Pain: Scale Used
□Numerical 0-10 (circle the correct rating)
0 1 2 3 4 5 6 7 8 9 10
□Faces Pain Scale-Revised

Verbal Descriptor Scale
Circle the words that best represent the intensity of your pain now.
No pain □Mild pain □Moderate pain □Severe pain □Extreme pain □Pain as bad as it could be
Location: (Resident or nurse mark drawing) Mark on the areas where you feel pain. If you feel more
than one sensation in the same area, mark over that area with all the symbols that apply. Make sure
you show all affected areas.

Aching □ Burning □ Cramping □Crushing □Dull □Numbness □Pins & Needles □Sharp □Shooting □Throbbing

History of Pain
Onset of Pain: □New (within the last 7 days) □Recent (within the last 3 mos.) □More distant (> 3 mos.) □Unknown
Frequency of Pain: □Constant □Frequent □Infrequent □Unknown
Description of Pain: □Aching □Burning □Cramping □Crushing □Dull □Numbness □Pins & Needles □Sharp □Shooting □Throbbing □Other, describe:
Change in Pattern of Pain: Has the pain changed in description or intensity the last 7 days? □Yes □No □Unknown If yes, describe the change:
Causes/Increases in Pain: □Movement □Coughing □Cold □Heat □Fatigue □Anxiety □Other, describe:
What Relieves the Pain: □Cold □Heat □Exercise □Eating □Opioids □Non-Opioid Meds □Massage □Relaxation □Rest □Repositioning □Distraction □Other, describe:
Effects of Pain: Using the following scale, rate how the pain has had an effect in each area in the past
24 hours: 0 (no effect) 2 (mild effect) 5 (moderate effect) 10 (severe effect)
Accompanying Symptoms (e.g., nausea) ______ Sleep Disturbance ______ Appetite Change ______ Physical Activity Change ______ Mood/Behavior Change ______ Concentration ______ Relationship with Others ______ Other (describe):

Worst Pain in 24 Hours: 0 1 2 3 4 5 6 7 8 9 10
□ No Pain □Moderate Pain □Worst Possible Pain
In the past 24 hours, how much have the medications or treatments eased your pain?
0 No relief 2 Mild relief 5 Moderate relief 8 Relief 10 Complete relief
Plan for Addressing Pain: □Initiate pain management flow sheet □Call Prescriber
□Refer to pain team □Rehab referral (PT, OT, ST) □Non-med intervention
□Medications prescribed □Spiritual counseling □Staff education/communication

Comments: ____________________________________________ Date: ___________

Signature/Title of person completing assessment: __________________________ Date: ______
VAS Patient Name ______________________________  Date __/__/____

How long have you had your symptoms? ______ days ______ weeks ______ months ______ years

On the diagram below, please indicate where, and what type of symptoms that you are experiencing, right now. Write the appropriate abbreviations (see the key below) over the area of the body where those symptoms are occurring.

A = ACHE
B = BURNING
N = NUMBNESS
P = PINS & NEEDLES
S = STABBING
O = OTHER_____

Instructions: Please fill in the bubble that corresponds to the pain level that you are experiencing.

Note: If you have more than one complaint, please indicate your pain levels for each complaint. Please indicate your pain level for (①) your pain at its worst, (②) your pain right now and (③) your average pain level.

Example:
No Pain ①②③④⑤⑥⑦⑧⑨⑩ Worst Possible

① My pain when it is at its worst is:

No Pain ①②③④⑤⑥⑦⑧⑨⑩ Worst Possible

② My pain right now is:

No Pain ①②③④⑤⑥⑦⑧⑨⑩ Worst Possible

③ My average pain level is:

No Pain ①②③④⑤⑥⑦⑧⑨⑩ Worst Possible

Patient/Other Signature __________________________  Relationship to Patient ________________________

Practitioner Signature ___________________________  Date __________

Pain Health Networks  VAS Form 1/107
# Abbey Pain Scale

**For measurement of pain in people with dementia who cannot verbalise**

**How to use scale:** While observing the resident, score questions 1 to 6

**Name/designation of person completing the scale**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>

**Latest pain relief given was at hours**

<table>
<thead>
<tr>
<th>Q1 Vocalisation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eg. whimpering, groaning, crying</td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q2 Facial expression</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eg. looking tense, frowning, grimacing, looking frightened</td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q3 Change in body language</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eg. fidgeting, rocking, guarding part of body, withdrawn</td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q4 Behavioural change</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eg. increased confusion, refusing to eat, alteration in usual patterns</td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q5 Physiological change</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eg. temperature, pulse or blood pressure outside of normal limits, perspiring</td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q6 Physical changes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eg. skin tears, pressure areas, arthritis, contractures, previous injuries</td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>Mild</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Add scores for 1–6 and record here**

<table>
<thead>
<tr>
<th>Total pain score</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Now tick the box that matches the total pain score**

<table>
<thead>
<tr>
<th>0–2</th>
<th>3–7</th>
<th>8–13</th>
<th>14+</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain</td>
<td>Mild</td>
<td>Moderate</td>
<td>Severe</td>
</tr>
</tbody>
</table>

**Finally, tick the box that matches the type of pain**

<table>
<thead>
<tr>
<th>Chronic</th>
<th>Acute</th>
<th>Acute on chronic</th>
</tr>
</thead>
</table>
### Figures: Tools Commonly Used to Rate Pain

#### Visual Analogue Scale

**Choose a Number from 0 to 10 That Best Describes Your Pain**

<table>
<thead>
<tr>
<th>No Pain</th>
<th>Distressing Pain</th>
<th>Unbearable Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

**ASK PATIENTS ABOUT THEIR PAIN**

**INTENSITY—LOCATION—ONSET—DURATION—VARIATION—QUALITY**

#### “Faces” Pain Rating Scale

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>NO HURT</td>
</tr>
<tr>
<td>1</td>
<td>HURTS LITTLE BIT</td>
</tr>
<tr>
<td>2</td>
<td>HURTS LITTLE MORE</td>
</tr>
<tr>
<td>3</td>
<td>HURTS EVEN MORE</td>
</tr>
<tr>
<td>4</td>
<td>HURTS WHOLE LOT</td>
</tr>
<tr>
<td>5</td>
<td>HURTS WORST</td>
</tr>
</tbody>
</table>

#### Behavioral Observation Pain Rating Scale

<table>
<thead>
<tr>
<th>Categories</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>Face</td>
<td>No particular expression or smile; disinterested</td>
</tr>
<tr>
<td>Legs</td>
<td>No position or relaxed</td>
</tr>
<tr>
<td>Activity</td>
<td>Lying quietly, normal position, moves easily</td>
</tr>
<tr>
<td>Cry</td>
<td>No crying (awake or asleep)</td>
</tr>
<tr>
<td>Consolability</td>
<td>Content, relaxed</td>
</tr>
</tbody>
</table>

**Occasional grimace or frown, withdrawn**

**Uneasy, restless, tense**

**Squirming, shifting back and forth, tense**

**Moans or whimpers, occasional complaint**

**Reassured by occasional touching, hugging, or talking to. Distractable**

**Frequent to constant frown, clenched jaw, quivering chin**

**Kicking, or legs drawn up**

**Arched, rigid, or jerking**

**Crying steadily, screams or sobs, frequent complaints**

**Difficult to console or comfort**

Each of the five categories (F: Face; L: Legs; A: Activity; C: Cry; C: Consolability) is scored from 0-2, which results in a total score between 0 and 10.
### Visual Analogue Scale

Choose a Number from 0 to 10 That Best Describes Your Pain

<table>
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<td>4</td>
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<td></td>
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<td>6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td></td>
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<td>10</td>
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</table>

ASK PATIENTS ABOUT THEIR PAIN

INTENSITY - LOCATION - ONSET - DURATION - VARIATION - QUALITY

### "Faces" Pain Rating Scale

<table>
<thead>
<tr>
<th>0</th>
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<th>2</th>
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</tr>
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<tbody>
<tr>
<td>NO HURT</td>
<td>HURTS LITTLE BIT</td>
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<td>HURTS WHOLE LOT</td>
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</tr>
</tbody>
</table>

### Behavioral Observation Pain Rating Scale

<table>
<thead>
<tr>
<th>Categories</th>
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</tr>
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<tbody>
<tr>
<td></td>
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<td>Legs</td>
<td>No position or relaxed</td>
</tr>
<tr>
<td>Activity</td>
<td>Lying quietly, normal position, moves easily</td>
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</tr>
<tr>
<td>Consolability</td>
<td>Content, relaxed</td>
</tr>
</tbody>
</table>

Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between 0 and 10.
PHYSIOLOGIC EFFECTS OF PAIN

• Increased morbidity and mortality

• Unrelieved pain causes a stress response which initiates a cascade of events

• Increased catabolic demand; poor wound healing, weakness, and muscle breakdown
PSYCHOLOGIC EFFECTS OF PAIN

• Negative emotions: anxiety, fear, hopelessness, and depression

• Sleep deprivation

• Existential suffering: may lead to patients seeking end of life

• Decreased quality of life

• Decreased coping skills
تشخیص پرستاری

- اختلال در خواب مربوط به درد
- به هم خوردن آسایش و راحتی
- عدم تحرک مربوط به درد
- عدم توانایی در تنفس موثر
اهداف پرستاری

• حذف یا کاهش محرک دردناک
• تسکین درد
• کمک به بیمار به منظور تصور کمتر درد
Analgesics
The Four “A’s” of Pain Treatment Outcomes

- Analgesia – modest but meaningful
- Activities of Daily Living (psychosocial functioning) – 80% rated as improved overall
- Adverse effects (side effects) – common but tolerable
- Aberrant drug taking (addiction-related outcomes)

Passik & Weinreb, 1998
WHO ladder

Step 1
Non opioids
+/- adjuvant

Step 2
Weak opioid
+ non opioid
+/- adjuvant

Step 3
Strong opioid
+ non opioid
+/- adjuvant

Modified WHO Analgesic Ladder

Proposed 4th Step

The WHO Ladder

Quality of Life

Invasive treatments

Opioid Delivery

Pain persisting or increasing

Step 3
Opioid for moderate to severe pain ± Nonopioid ± Adjuvant

Pain persisting or increasing

Step 2
Opioid for mild to moderate pain ± Nonopioid ± Adjuvant

Pain persisting or increasing

Step 1
± Nonopioid ± Adjuvant

Pain
- Treat with non-opioid +/- adjuvant

- Treat with Opioid for mild-moderate **pain** +/- non-opioid +/- adjuvant

- Treat with Opioid for moderate–severe **pain** +/- non-opioid +/- adjuvant
Mild Pain

1-3 on scale

Nonopioids

Use of adjuvant drugs
Moderate Pain

4-6 on 0-10 scale

Step II drugs - Opioids

Mixed Agonists-Antagonists
Moderate to Severe Pain

7-10 LEVEL

STEP III – POTENT DRUGS

MANY DELIVERY ROUTES

CHECK RESPIRATORY RATE
Prescription Drug Abuse

The Drugs

DEA schedule classification:

II = high abuse/dependence potential (opioid, analgesics, amphetamines)

III = lower abuse/dependence potential (compounded opioid analgesics)

IV = lower abuse/dependence potential (sedative hypnotics, some stimulants)

V = minimal abuse/dependence potential
Principles of analgesic use

Three classes

1. Nonopioid (paracetamol and NSAIDs)
2. Opioid (weak and strong)
3. Adjuvant (e.g. corticosteroids, antidepressants, anticonvulsants, muscle relaxants)
Phospholipids → Phospholipase A₂ → Arachidonic Acid

- COX → Prostaglandins
- Lipoxygenase → Leukotrienes
- Thromboxanes
- Prostacyclin
Non-Opioids

- **Benefits**
  - Good for mild pain
  - Good for sore, aching pain
  - Treats inflammation
  - Treats fever
  - Many products
  - Available in oral, topical, parenteral and rectal forms
  - Not habit forming
Non-Opioids

- **Risks / problems**
  - Ceiling effect
  - May delay healing
  - GI toxicity
  - Renal toxicity
  - Hepatic toxicity
  - Asthma, HTN warning
Acetaminophen

- Step 1 analgesic, coanalgesic
- Site, mechanism of action unknown
  - minimal anti-inflammatory effect
- Hepatic toxicity if > 4 g / 24 hours
  - increased risk
    - hepatic disease, heavy alcohol use
Acetaminophen

- May inhibit COX selectively in central nervous system
- Only weak inhibitor of peripheral COX (peroxide effects?)
- Inhibits effects of substance P in CNS?
- Inhibits effects of glutamate in CNS?
Salicylates produce peripheral blood vessel dilation
- Most common pain reliever
- Control pain
- Reduce fever-stimulate hypothalmus
- Reduce inflammation
- ASA is oldest nonnarcotic analgesic
- Bonus effect-inhibits platelet aggregate

Guideline
- Use lowest dose that produces analgesia
- Highly protein bound-can interfere w/other drugs
  - Heparin, methotrexate, oral antidiabetic meds, insulin
Aspirin - Multiple **Physiological Effects**

**Analgesic** – reduces or eliminates pain.

**Antipyretic** - lowers or eliminates fever.

**Anti-inflammatory agent** - reduces or eliminates inflammation.

**Anti-coagulant** - inhibits the formation of blood clots by decreasing platelet concentrations, ie. decreases incidence of heart attacks resulting from the formation of internal clots that can block the flow of blood to the heart.
Aspirin (rapid)

Salicylate

Metabolites (slower)

In urine
- **Adverse reactions**
  - Hearing loss
  - Diarrhea
  - Thirst
  - Sweating
  - Tinnitus
  - Confusion
  - Dizziness
  - Impaired vision
  - Hyperventilation
  - Reye’s syndrome—when given to children *(do not use < 12 yrs old)*

- **Common side effects**
  - Gastric distress
  - Bleeding tendencies
  - NVD
### Aspirin

<table>
<thead>
<tr>
<th>Usual dose</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 – 160 mg</td>
<td>Antiplatelet</td>
</tr>
<tr>
<td>325 – 1000 mg</td>
<td>Analgesic, antipyretic</td>
</tr>
<tr>
<td>325 mg – 6 grams</td>
<td>Antiinflammatory, tinnitus</td>
</tr>
<tr>
<td>6 – 10 grams</td>
<td>Respiratory alkalosis</td>
</tr>
<tr>
<td>10 – 20 grams</td>
<td>Fever, dehydration, acidosis</td>
</tr>
<tr>
<td>&gt; 20 grams</td>
<td>Shock, coma</td>
</tr>
</tbody>
</table>
NSAIDs

- Step 1 analgesic, coanalgesic
- Inhibit cyclo-oxygenase (COX)
  - vary in COX-2 selectivity
- All have analgesic ceiling effects
  - effective for bone, inflammatory pain
  - individual variation, serial trials
NSAIDs

- Highest incidence of adverse events
- Gastropathy
  - gastric cytoprotection
  - COX-2 selective inhibitors
Second generation NSAIDS

- COX-2 inhibitors
- COX 1 inhibitor
  - Decreased protection of lining of stomach
  - Clotting time decreased-benefit cardiovascular patients
NSAIDS

- Analgesic
- Antiinflammatory
- Reversible inhibitors of COX
- Nonselective inhibitor of COX (adverse effects)
- Analgesic ceiling
**Adverse reactions**

- Abdominal pain, bleeding
- Anorexia
- Diarrhea, nausea
- Ulcers
- Liver toxicity
- Drowsiness
- Headache
- Tinnitus
- Confusion
- Vertigo
- Depression
- Blood in urine, bladder infection, kidney necrosis
- Sodium & water retention
- Heart failure
- Pedal edema
Nursing implications

- CBC, platelet count, PT
- Monitor hepatic / renal function
- Bronchospasm
- Monitor for s/s of bleeding
- Take w/meals
- Avoid alcohol
Opioid
Opioid—any derivative of opium plant or any synthetic drug that imitates natural narcotics

Opioid agonists—include opium derivatives and synthetic drugs w/similar properties

Decrease pain without losing consciousness

Opioid antagonists

- Block effects of opioid agonists
- Used to reverse drug reactions, CNS depression
- Narcan (always keep antagonist nearby)
Opioid agonists

- Any route
- Inhalation uncommon
- Absorbed from GI tract
- Transmucosal / intrathecal fast acting
- IV provides most rapid and almost immediate
- Sub Q and IM delayed absorption
  - Poor circulation can cause further delay
- Metabolized extensively in the liver
  - Administration of meperidine > 48 hours increases risk of neurotoxicity and seizures from buildup
Mechanisms by Which Opioid Analgesics Work

- Reduce the perception of pain sensation
- Produce sedation
- Decrease emotional upsets associated with pain
Sites of Opioid Action (*)

- Midbrain
- Medulla
- Spinal Cord
- Sensory Nerve
- Ascending Tract
Characteristics of Opioid Analgesics

- Most are Schedule II or III drugs
- May be given PO, IV, IM, SQ, or topically
- Oral drugs undergo significant first-pass metabolism
- Metabolized by liver and excreted in urine
- Exert CNS effects
- Use cautiously in clients with renal or hepatic disease, respiratory depression or increased intracranial pressure
- Exert depressant effect on GI tract
- Not recommended for prolonged periods of use except with chronic pain or malignant diseases
Opioid Therapy

- Trial consists of phases:
  - Initiation
  - Titration
  - Maintenance

- Choice of Agent:
  - Short acting
  - Long acting
Physical Dependence

- Physiologic state.
- Withdrawal syndrome.
- Expected occurrence.
- Does not imply addiction.
Tolerance

- Neuroadaptation to effects of chronic use.
- Occurs to both analgesic and adverse effects.
- Does not imply addiction.
Addiction

- Persistent pattern of dysfunctional use.
- Loss of control over use.
- Preoccupation with obtaining opioids.
- Continued use despite adverse consequences.
Pseudoaddiction

- Describes behavior when pain is under treated.
- Focused on obtaining medications.
- Behavior resolves when effectively treated.
- May inappropriately stigmatize patient.
Nursing process

- Assess pain before and after administration
- Monitor for adverse reactions / side effects
- Monitor for tolerance dependence
  - Shortened duration of effect
- Evaluate respiratory status before each dose
  - Respiratory depression
  - Restlessness
# Commonly Abused Opioids

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Brand Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diacetylmorphine</td>
<td>Heroin</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>Dilaudid</td>
</tr>
<tr>
<td>Meperidine</td>
<td>Demerol</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>Lortab, Vicodin</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>OxyContin, Percodan, Percocet, Tylox</td>
</tr>
</tbody>
</table>
Opioid Antagonists

- Reverse or block analgesia, CNS and respiratory depression of opioid agonists
- Compete with opioids for opioid receptor sites in brain
- Do not relieve depressant effects of anti-anxiety drugs or antipsychotics
- Naloxone - oldest, most commonly known
- Nalmefene - newer with longer duration
- Naltrexone - used in maintenance of opiate free states in opiate addicts
Characteristics of Withdrawal From Opiates

- Generalized body aches
- Insomnia
- Lacrimation
- Rhinorrhea
- Perspiration
- Pupil dilation

- Piloerection
- Anorexia
- Increased vital signs
- Abdominal and other muscle cramps
Treatment Of Withdrawal Syndrome

- Gradually reduce the opioid over several days
- Substitute methadone and slowly reduce dose over a longer time
- Clonidine reduces withdrawal symptoms
Respiratory Depression

- Pain is a physiological antagonist to the central depressant effects of morphine.
- Chronic dosing with appropriately titrated strong opioids do not cause clinically important respiratory depression in cancer patients in pain when used correctly.
- Caution in sleep apnoea (CAL generally safe if correct titration).
Alternative routes of administration

- Enteral feeding tubes
- Transmucosal
- Rectal
- Transdermal
- Parenteral
- Intraspinal
Some Opioid – Nonopioid Combinations

- Codeine + Aspirin (Empirin)
- Codeine + Acetaminophen (Tylenol#?)
- Dihydrocodeine + Aspirin + caffeine (DHC Plus)
- Hydrocodone + Acetaminophen (Lortab ?/?)
- Oxycodone + Acetaminophen (Percocet)
- Pentazocine + Aspirin (Talwin compound)
- Propoxyphene + Acetaminophen (Wygesic)
Adjuvant Analgesics
Adjuvant Analgesics

- Multipurpose analgesics
- Drugs used for neuropathic pain
- Drugs used for musculoskeletal pain
- Drugs used for cancer pain
- Drugs used for headache
# Coanalgesics (Adjuvants)

*Drugs used to treat specific symptoms or side effects*

## Specific Symptoms

- Neuropathic/Neuralgic
  - Antiepileptics
  - Tricyclic antidepressants
  - Local Anesthetics
- Sympathetically mediated
  - Alpha 2 agonists
- Others

## Side Effects

- Antiemetics
- Bowel regimen
- Psychostimulants
Adjuvant Therapy

- Tricyclic antidepressants
- Antiseizure
- Useful neuropathic pain
- A2-adrenergic agonists
- Corticosteroids
- Local Anesthetics
- Topical Adjuvant Analgesics
Non-pharmacological Relief Methods

Physical Methods

Psychological Methods

Complementary Methods

Social Methods
خسته نباشید