

# ĐAU MẠN TÍNH SAU PHẪU THUẬT: LÀM SAO ĐỂ NGĂN NGỪA?

TANG HA NAM ANH

HỆ THỐNG BỆNH VIỆN ĐA KHOA TÂM ANH

LYR-2023-0281





## CHRONIC PAIN: DEFINITION

**‘Pain that persists or recurs for longer than 3 months’**



Definition ICD-11

### Chronic pain is multifactorial

- biological, psychological and social factors contribute to the pain syndrome.
  - Even if an initial injury in an anatomical structure can be identified, the pain experience and disability of an individual will be determined by an array of psychosocial factors
  - Limited effectiveness of biomedical and monomodal treatments
  - Need for multimodal & interdisciplinary approach

ICD-11 for Mortality and Morbidity Statistics. Available at: <https://icd.who.int/browse11/l-m/en#/http%3a%2f%2fid.who.int%2fcd%2fentity%2f1581976053> (Accessed October 2022); Morlion, B. *Nature Rev Neurol*. 2013;9:462–73

# COMPLEX REGIONAL PAIN SYNDROME

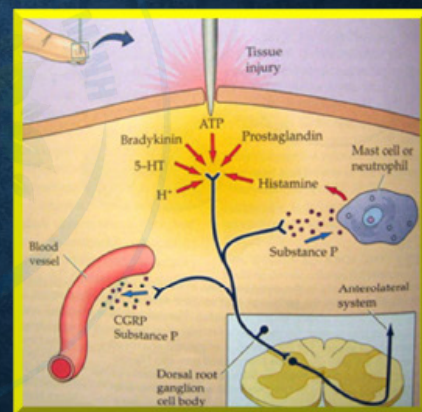
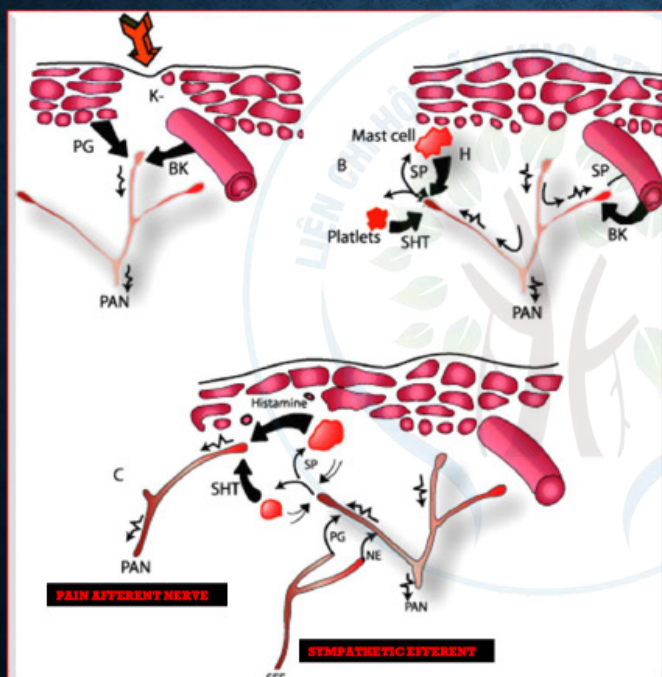
## INTRODUCTION

- Chronic pain disorder affecting upper or lower extremities
- Post trauma, fracture, surgery, immobilization...
- Regionally restricted (not relate to dermatome)
- Incidence 0.8%, 21% post TKA
- 3 to 4-fold higher incidence in women, high BMI
- Aged 61-70 yr.

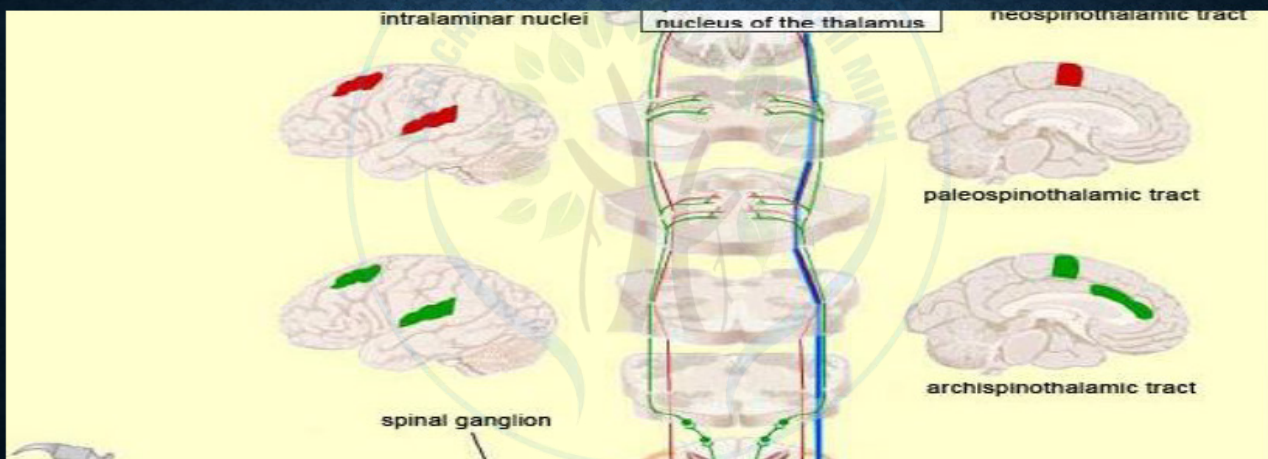
## HISTORY

- 1864, Civil War: a severe burning pain and red skin, “causalgia”
- 1946, “reflex sympathetic dystrophy” RSD
- 1994, International Association for the Study of Pain (IASP) : Complex Regional Pain Syndrome (CRPS)
- reflex sympathetic dystrophy – CRPS I
- Causalgia – CRPS II

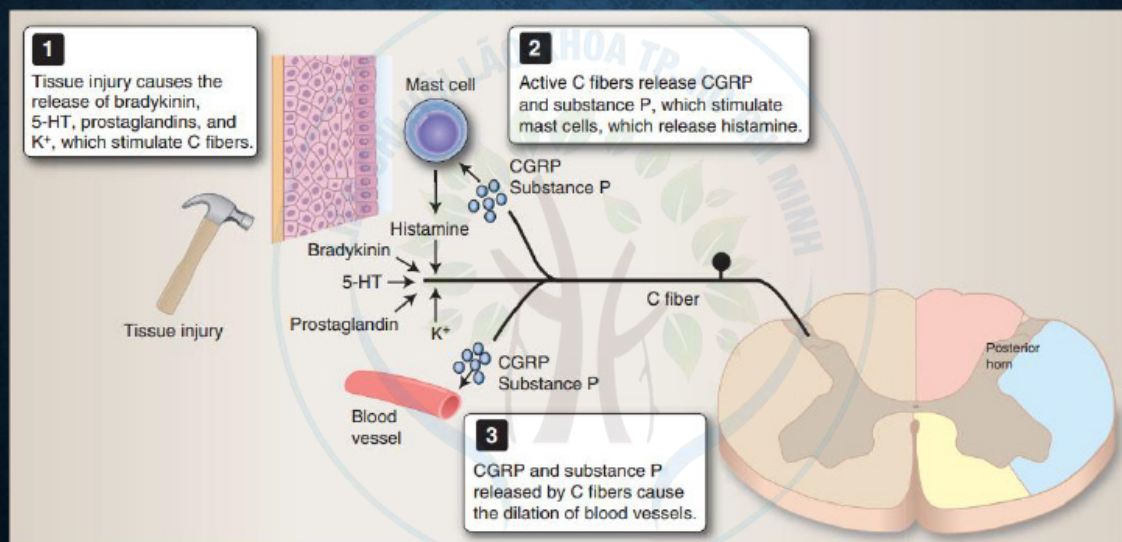
### CHỨC NĂNG CHÍNH CỦA THỤ CẢM ĐAU: BIẾN TẤT CÁC TÁC NHÂN KÍCH THÍCH THÀNH ĐIỆN THỂ ĐỘNG



## ĐƯỜNG DẪN TRUYỀN TÍN HIỆU ĐAU



## NOCICEPTOR ACTIVATION



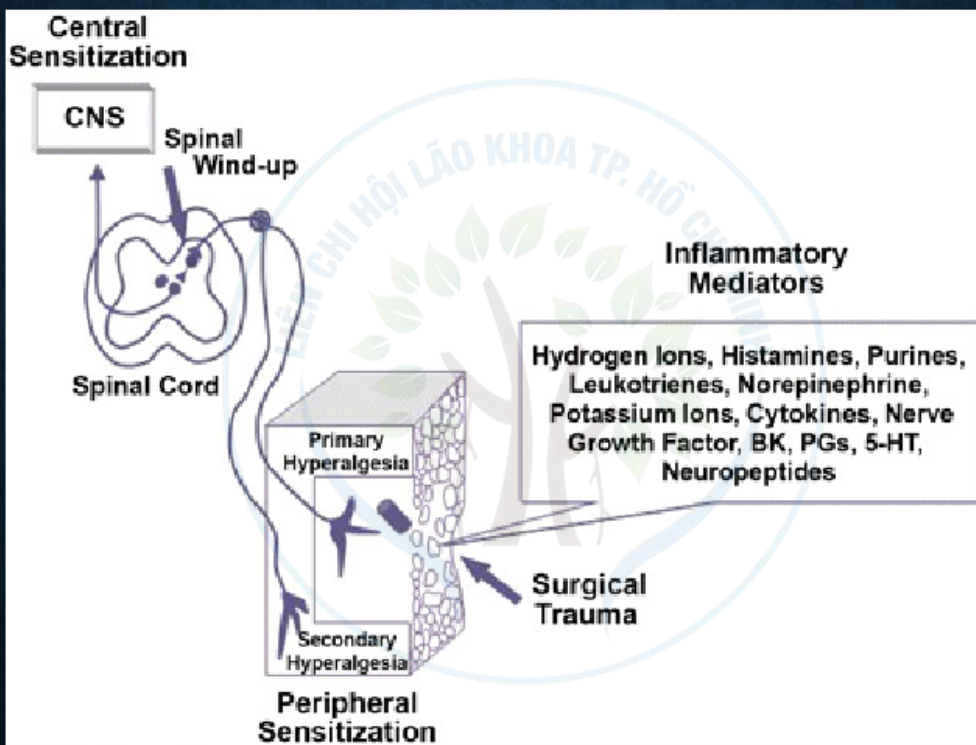
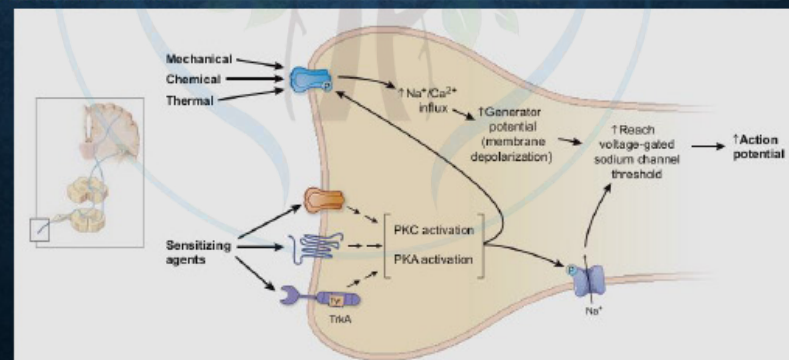
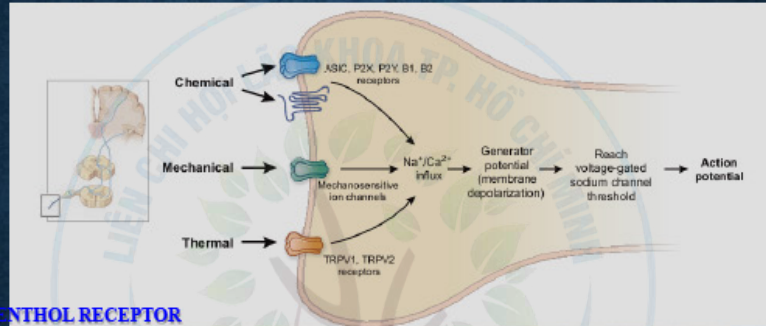
**Hyperalgesia, allodynia.**

# HỘI NGHỊ KHOA HỌC THƯỜNG NIÊN 2023 LIÊN CHI HỘI LÃO KHOA TP. HỒ CHÍ MINH

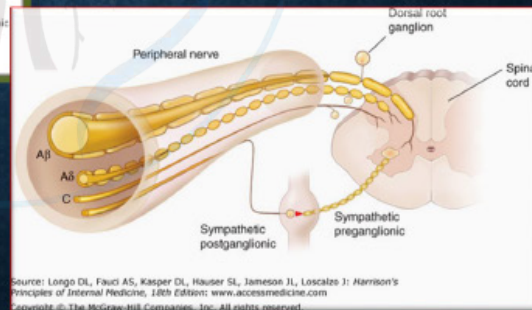
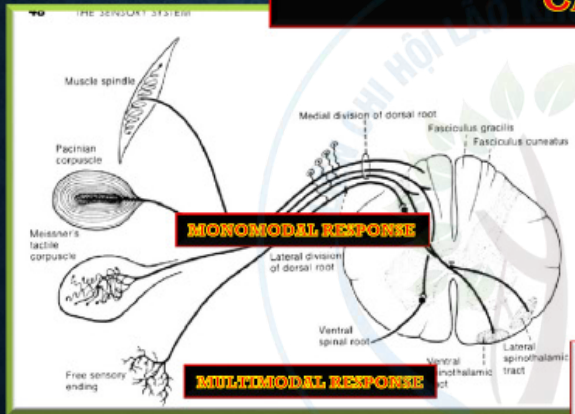
## BIỂU HIỆN GENE CÁC THỤ THỂ CỦA CHẤT GÂY ĐAU VÀ TĂNG NHẠY CẢM VỚI CẢM GIÁC ĐAU HIỆN TƯỢNG NHẠY CẢM HOÁ NGOẠI BIÊN

TRPV1 ~ 42°C  
(CAPSAICIN RECEPTOR)  
TRPV2 ~ 50°C

TRPA1 < 10°C  
TRPM8: COLD MENTHOL RECEPTOR



**TRỰC SỢI C TẬN CÙNG Ở SỪNG SAU & LÀ THÀNH PHẦN CỦA CUNG PHẦN XẠ TRỰC GIAO CẢM**

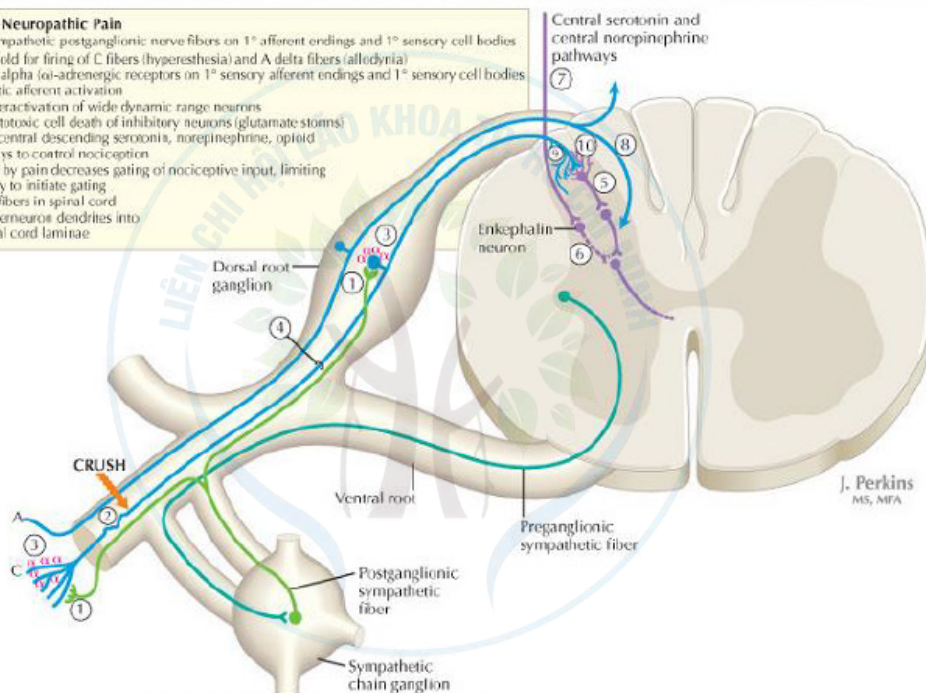


Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: Harrison's Principles of Internal Medicine, 18th Edition. www.accessmedicine.com Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

**(NEUROPATHIC PAIN)**

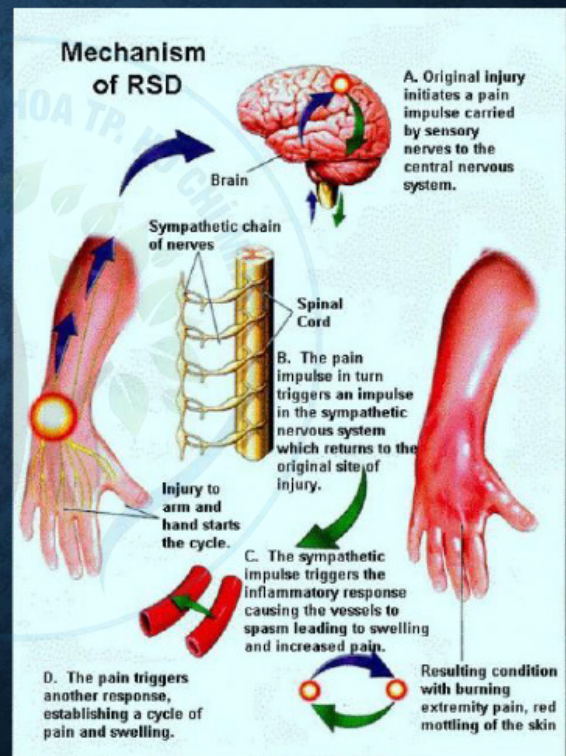
**Mechanisms of Neuropathic Pain**

1. Sprouting of sympathetic postganglionic nerve fibers on 1<sup>o</sup> afferent endings and 1<sup>o</sup> sensory cell bodies
2. Lowered threshold for firing of C fibers (hyperesthesia) and A delta fibers (allodynia)
3. Proliferation of alpha (α)-adrenergic receptors on 1<sup>o</sup> sensory afferent endings and 1<sup>o</sup> sensory cell bodies
4. Possible ephaptic afferent activation
5. Permanent hyperactivation of wide dynamic range neurons
6. Glutamate excitotoxic cell death of inhibitory neurons (glutamate storms)
7. Inadequacy of central descending serotonin, norepinephrine, opioid peptide pathways to control nociception
8. Immobilization by pain decreases gating of nociceptive input, limiting physical therapy to initiate gating
9. Sprouting of C fibers in spinal cord
10. Extension of interneuron dendrites into additional spinal cord laminae



Felten & Shetty: Netter's Atlas of Neuroscience, 2nd Edition. Copyright © 2009 by Saunders, an imprint of Elsevier, Inc. All rights reserved.

**COMPLEX REGIONAL  
PAIN SYNDROME -  
REFLEX SYMPATHETIC  
DYSTROPHY**



**COMPLEX REGIONAL PAIN SYNDROME ( CRPS)**

- Reflex sympathetic dystrophy ( RSD)
- Causalgia
- Sudeck's atrophy
- Shoulder-hand syndrome
- Neuroalgodystrophy
- Reflex neurovascular dystrophy



- CRPS type I: without obvious nerve damage ( aka RSD)
- Type II: with obvious nerve damage ( aka Causalgia)
- Higher level of anxiety sympomp prior to TKA: greater likelihood of displaying CRPS sympomp at 1 month post surgery

## **CLINICAL PRESENTATION**

- 2 phases
- Acute “warm” phase: hyperaesthesia and/or allodynia
- Chronic “cold” phase about 6 months later
- Autonomic symptoms: hyper- or hypohidrosis, skin colour changes
- Motor disorders: “kinesiophobia”

## **IASP DIAGNOSTIC CRITERIA**

- 1) the presence of an initiating noxious event or a cause of immobilization
- 2) continuing pain, allodynia, or hyperalgesia with which the pain is disproportional to any inciting event
- 3) evidence at some time of edema, changes in skin blood flow, or abnormal sudomotor activities in the region of pain.
- 4) this diagnosis is excluded by the existence of condition that would otherwise account for the degree of pain and dysfunction

## **BUDAPEST DIAGNOSTIC CRITERIA FOR CRPS**

- **DEFINITION:** array of painful condition: a continuing regional pain.
- Disproportion in time or degree to the unusual course of any trauma or other lesion
- Abnormal sensation, motor, sudomotor, vasomotor, and or trophic findings

1) Continuing pain, which is disproportionate to any inciting event

2) must report at least one symptom in three of the four following categories:

Sensory: report of hyperesthesia and/or allodynia.

Vasomotor: report of temperature asymmetry and/or skin color changes and /or sweating asymmetry

Sudomotor/edema: reports of edema and/or sweating changes and/or sweating asymmetry

Motor /trophic: reports of decreased range of motion and/or motor dysfunction ( weakness, tremor, dystonia) and/or trophic changes ( hair, nail, skin)

• 3) must display at least one sign at time of evaluation in two or more of the following categories:

• Sensory: evidence of hyperalgesia ( to pinprick) and/or allodynia ( to light touch and/or deep somatic pressure and/or joint movement)

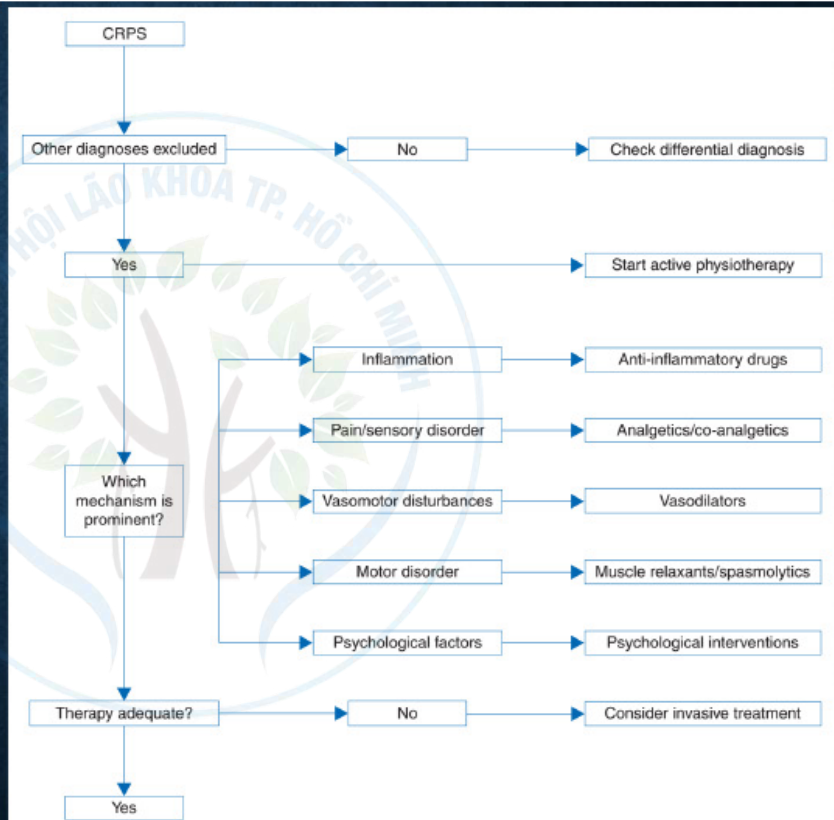
• Vasomotor: evidence of temperature asymmetry and/or skin color changes and /or asymmetry

• Sudomotor/edema: evidence of edema and/or sweating changes and /or sweating asymmetry

• Motor/trophic: evidence of decreased range of motion and/or motor dysfunction ( weakness, tremor, dystonia) and/or trophic changes ( hair, nail, skin)

• 4) there is no other diagnosis that better explains the signs and the symptoms

## CLINICAL PRESENT ATION

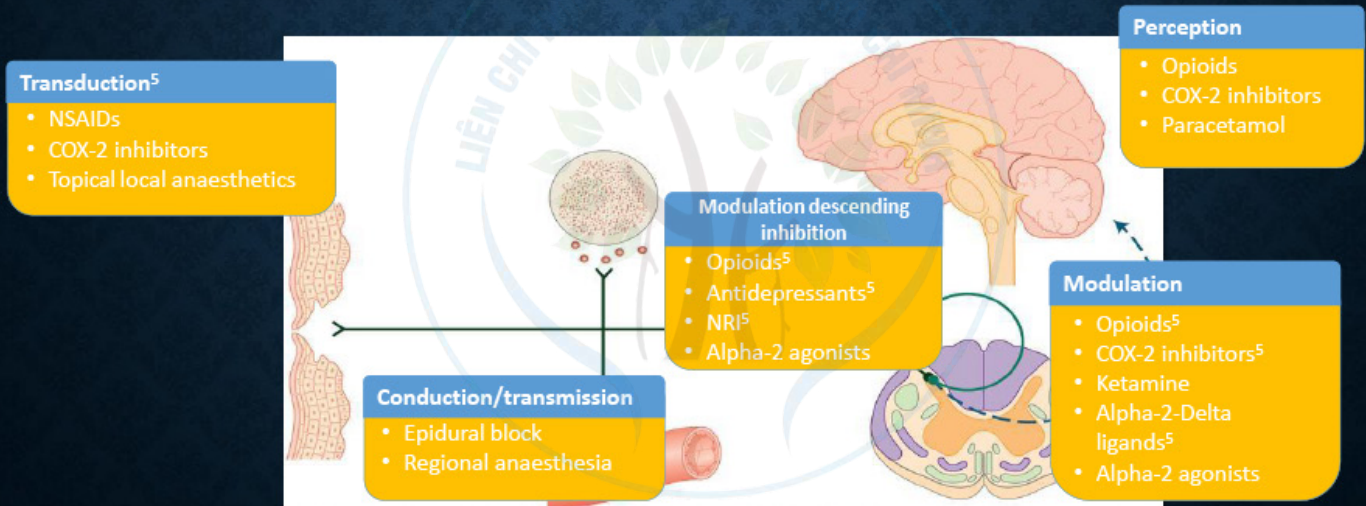


## TREATMENT

- THE RATIONAL FOR FUNCTIONAL RESTORATION
- Normalized movement: key objective in treating.
- Pain is a central component of CRPS.
- REHABILITATION-BASED TREATMENT MODALITIES
- Occupational therapist: ideal therapeutic leader: normalized sensation and posture, decrease muscle guarding, minimize edema and increase normal use.
- PT: ROM, flexibility, posture and weight bearing and strength
- Recreational therapist: develop confidence through previously lost recreational activities

## MULTIMODAL PHARMACOTHERAPY OF PAIN

- Targeting the basic nociceptive processes<sup>1,2</sup>
- Combination of different drugs and/or routes of administration<sup>3,4</sup>



1. Kumar S, et al. *OA Anaesthetics*. 2014;2:2.

2. Julius D, Basbaum AI. *Nature*. 2001;413:203-210.

3. Lee B, et al. *Best Pract Res Clin Anaesthesiol*. 2018;32:101-111.

4. Dunkman WJ, Manning MW. *Surg Clin North Am*. 2018;98:1171-1184.

5. Gilron I, et al. *Lancet Neurol*. 2013;12:1084-1095.

## TREATMENT

- Vocational rehabilitation counselor: ultimate functional restoration: return to work

## HỘI NGHỊ KHOA HỌC THƯỜNG NIÊN 2023 LIÊN CHI HỘI LÃO KHOA TP.HỒ CHÍ MINH

Condition/Presentation	Suggested Response
Mild to moderate pain	Simple analgesics and/or blocks
Excruciating, intractable pain	Opioids and/or blocks or later, more experimental interventions
Inflammation/swelling and edema	Steroids, systemic or targeted (acutely) or NSAIDs (chronically); immunomodulators
Depression, anxiety, insomnia	Sedative, analgesic antidepressant/anxiolytics (and/or psychotherapy)
Significant allodynia/hyperalgesia	Anticonvulsants and/or other sodium channel blockers and/or N-methyl-D-aspartate-receptor antagonists
Significant osteopenia, immobility, and trophic changes	Calcitonin or bisphosphonates
Profound vasomotor disturbance	Calcium channel blockers, sympatholytics and/or blocks

- **PSYCHOLOGIC INTERVENTION**
- learned disuse, fear of pain, cognitive responses to CRPS, life stress, emotional distress
- Relaxing technique
- **INTERVENTIONAL THERAPIES**
- Nerve block, infusion, stimulators

## Pharmacotherapy of Pain

### ACUTE PAIN

- Mostly inflammatory & nociceptive mechanisms
- Paracetamol/NSAIDs/COX-2 inhibitors/opioids
- **NNT: 1.5-2.5**

### PAIN

- More neuropathic and nociplastic mechanisms
- Only 40–50% of patients reach 30% pain relief
- Average improvements ranging from <10 to 20 mm VAS versus placebo
- More atypical analgesics
  - Antidepressants, anticonvulsants, NMDA antagonists, opioids, alpha 2 agonists etc., capsaicin etc...

**NNT: 4->10**

1. Moore RA, et al. *Cochrane Database Syst Rev.* 2015;CD010794; 2. Dworkin RH, et al. *Pain.* 2011;152:S107-15; 3. Dworkin RH, et al. *Pain.* 2007;132:237-251; 4. Attal N, Bouhassira D. *Pain.* 2015;156 (Suppl 1):S104-14.

## OPTIONS OF MULTIMODAL THERAPY FOR COMMONLY PERFORMED SURGERIES

**Table 3. Options for Components of Multimodal Therapy for Commonly Performed Surgeries**

Type of Surgery	Systemic Pharmacologic Therapy	LOCAL, INTRA-ARTICULAR OR TOPICAL TECHNIQUES*	REGIONAL ANESTHETIC TECHNIQUES*	NEURAXIAL ANESTHETIC TECHNIQUES*	NONPHARMACOLOGIC THERAPIES†
Thoracotomy	Opioids; NSAIDs and/or acetaminophen Gabapentin or pregabalin i.v. ketamine‡		Paravertebral block	Epidural with local anesthetic (with or without opioid), or intrathecal opioid	Cognitive modalities TENS
Open laparotomy	Opioids; NSAIDs and/or acetaminophen Gabapentin or pregabalin i.v. ketamine‡ i.v. lidocaine§	Local anesthetic at incision i.v. lidocaine infusion	Transversus abdominis plane block	Epidural with local anesthetic (with or without opioid), or intrathecal opioid	Cognitive modalities TENS
Total hip replacement	Opioids; NSAIDs and/or acetaminophen Gabapentin or pregabalin i.v. ketamine‡	Intra-articular local anesthetic and/or opioid	Site-specific regional anesthetic technique with local anesthetic	Epidural with local anesthetic (with or without opioid), or intrathecal opioid	Cognitive modalities TENS
Total knee replacement	Opioids; NSAIDs and/or acetaminophen Gabapentin or pregabalin i.v. ketamine‡	Intra-articular local anesthetic and/or opioid	Site-specific regional anesthetic technique with local anesthetic	Epidural with local anesthetic (with or without opioid), or intrathecal opioid	Cognitive modalities TENS
Spinal fusion	Opioids; Acetaminophen Gabapentin or pregabalin i.v. ketamine‡	Local anesthetic at incision		Epidural with local anesthetic (with or without opioid), or intrathecal opioid	Cognitive modalities TENS
Cesarean section	Opioids; NSAIDs and/or acetaminophen	Local anesthetic at incision	Transversus abdominal plane block	Epidural with local anesthetic (with or without opioid), or intrathecal opioid	Cognitive modalities TENS
CABG	Opioids; Acetaminophen Gabapentin or pregabalin i.v. ketamine‡				Cognitive modalities TENS

Abbreviation: CABG, coronary artery bypass grafting.  
NOTE: Blank cells indicate techniques generally not used for the procedure in question.  
\*Intra-articular, peripheral regional, and neuraxial techniques typically not used together.  
†Use as adjunctive treatment.  
‡Use i.v. PCA when parenteral route needed for more than a few hours and patients have adequate cognitive function to understand the device and safety limitations.  
§May be administered preoperatively.  
¶On the basis of panel consensus, primarily consider for use in opioid-tolerant or otherwise complex patients.

Chou R, Gordon DB, Leon-Casasola et al. Guidelines on the Management of Postoperative Pain. *The Journal of Pain.* 2016;17(2):131-157.

**THANK YOU FOR YOUR ATTENTION**

