신경과의사로서의 통증치료에 대한 소개

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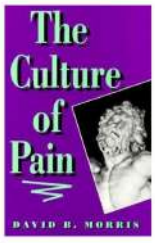
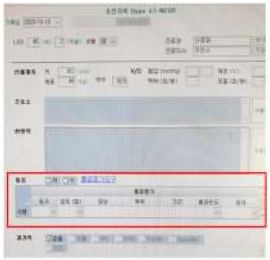
"고금을 막론하고 모든 환자의 간절한 바람은 통증 뿐 아니라
통증의 미스터리에서 벗어나는 것이다."
(from *The Culture of Pain*, 1991)





PAIN is a 5th vital sign
(Campell JN, American Pain Society, 1995)

-> Awareness without preparedness

Revised IASP Definition of Pain (2020)

Pain

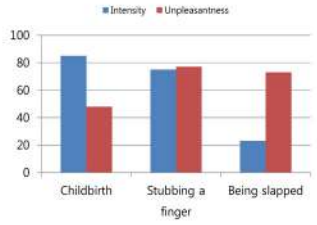
An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage.

Notes

- Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.
- Pain and nociception are different phenomena. Pain cannot be inferred solely from activity in sensory neurons.
- Through their life experiences, individuals learn the concept of pain.
- A person's report of an experience as pain should be respected.*
- Although pain usually serves an adaptive role, it may have adverse effects on function and social and psychological well-being.
- Verbal description is only one of several behaviors to express pain; inability to communicate does not negate the possibility that a human or a nonhuman animal experiences pain.

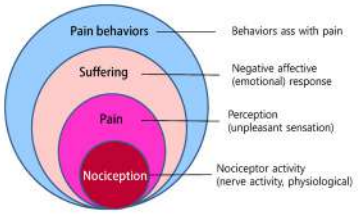
Etymology

Middle English, from Anglo-French peine (pain, suffering), from Latin poena (penalty, punishment), in turn from Greek poinē (payment, penalty, recompense). *The Declaration of Montréal, a document developed during the First International Pain Summit on September 3, 2010, states that "Access to pain management is a fundamental human right."



Pain: subjective, and unique to each individual (personal), experience

Components of pain

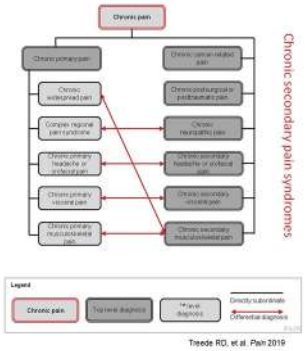


Loeser JD. *Clinical pharmacology and therapeutics. 1980*

Classification of pain

1. Acute, **Chronic** (≥ 3 m)
2. Nociceptive, Neuropathic, (Mixed), Nociplastic*

**Pain that arises from altered nociception without actual or threatened tissue damage*

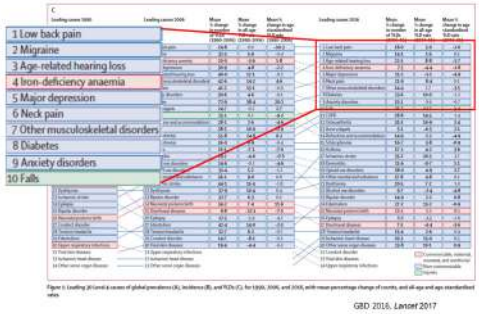


Treede RD, et al. *Pain* 2019

Scales used for evaluating (neuropathic) pain

Classification of Scales			
Intensity	**Temporal and Affective**	**Interference**	**Neuropathic Pain**
Numeric rating scale (NRS) Visual analogue scale (VAS) Verbal rating scale (VRS) Faces Pain Scale	Brief Pain Inventory (BPI) McGill Pain Questionnaire (MPQ) Short form MPQ (SF-MPQ)	Brief Pain Inventory Pain Interference Scale Medical Outcomes Study 36 items Short Form (SF-36)	Neuropathic Pain Scale (NPS) Neuropathic Pain System Inventory (NPSI) Neuropathic Pain Questionnaire (NPQ) Neuropathic Pain Screening Questionnaire (ID Pain) Neuropathic Pain Detection Questionnaire (PainDETECT) Leeds Assessment of Neuropathic Signs and Symptoms (LANSS) Douleur Neuropathique en 4 Questions (DN4) Standardized Evaluation of Pain (SEP)

Leading causes of YLDs



GBD 2016, *Lancet* 2017

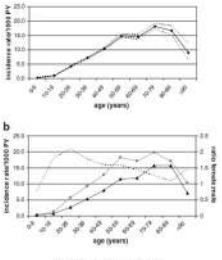
Ten most common reasons for visits to the physician

1. Skin Problem
2. Joint pain and osteoarthritis
3. Back pain
4. Cholesterol (lipid metabolism)
5. Upper respiratory issues
6. Anxiety and depression
7. Chronic neurologic disorder
8. Hypertension
9. Headache and migraine
10. Diabetes

St. Sauver JL, et al. *Mayo Clin Proc* 2013

Epidemiology of pain

- Chronic pain prevalence: 4-20% (15%)
- Neuropathic pain
  - annual incidence : 1% of general population
  - prevalence: 7-10%



Dieleman JP, et al. *Pain* 2008

Pain medicine education: a need for improvement

- Using questionnaires for practicing neurologists (PN) and neurology residency directors (PD)
- Responders: 313 (45%) of 700
- **30%: adequately trained to diagnose pain**
- **20%: adequately trained to treat pain disorders**
- **91%: a need for more pain education**
- Pain conditions considered "essential" or "moderately important" in the training of neurologists

Pain condition	PN (%)	PD (%)	*p* value
Neuropathic pain	100	95	NS
Acute neck and back pain	96	90	NS
Myofascial pain	80	47	0.001
Fibromyalgia	64	36	0.001
Cancer pain	51	59	NS

Galer BS, et al. *Neurology* 1999

Pain medicine: emerging subspecialties in neurology

- 400 neurologists double board-certified in neurology and pain medicine
- But, 1-2% of the total pain fellow applicant pool
- Pain medicine: an exciting hands-on subspecialty
- **Advantages of neurologists for pain medicine**
  - obtaining an expert history and P/E and N/E
  - having a widespread knowledge about pain etiologies
  - critically evaluating resulting from diagnostic testing
  - providing a thoughtful assessment and plan

Schuster NM and Hascalovici JR. *Neurology 2018*

IASP curriculum on pain: objectives

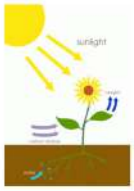
1. Recognize **pain medicine as a necessary field** in clinical practice for acute and chronic pain conditions
2. Understand the basic science of pain-processing components such as anatomy, physiology, and pharmacology
3. Identify clinical presentation of acute and chronic pain syndromes or conditions
4. Recognize the **multidimensional aspects** of pain experience and its related management
5. Understand pain management options appropriate for individual patients
6. Know the indications, contraindications, and risks of the primary elements of multimodal pain management
7. Learn effective interaction with multi-professional teams involved in practicing pain medicine
8. Practice pain medicine according to ethical principles

https://www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=729

Pain treatment

- Unsatisfactory
- Pain is not unidimensional problem
  - NRS: 1-dimensional pain measurement (sensory experience of pain)
- **Multidimensional** approach on pain evaluation and measures
  - the BPI or SF-MPQ, etc.
- **Multimodal** approach for appropriate treatment

Factors influencing pain



Whitten CE, et al. *Perm J* 2005

Factors that CLOSE the gate decrease pain	Factors that OPEN the gate increase pain
Physical • Comfortable furniture that fits (beds, chairs, car seats) • Heat/cold • Pacing activities • Adequate rest • Massage	**Physical** • Inactivity/deconditioning • Poor or nonrestorative sleep
Chemical • Medications • Diet: eg, Mg^{++}, Ca^{+}, vitamin B complex	**Chemical** • Drug and alcohol dependence • Nicotine
Behavioral • Relaxation • Direct, rewarding communication • Humor • Pleasurable activities • Relaxation/meditation/prayer	**Behavioral** • Trying to do too much too quickly • Difficult relationships • Social isolation • Stress • Persistent worry
Thoughts and emotions • Optimism/positive outlook • Setting realistic goals • Affirming of self	**Thoughts and emotions** • Negative outlook/catastrophizing • Hopelessness/worry • Suppressing emotions • Anger • Depression/anxiety • Focusing on pain
Structural • Surgery (sometimes)	**Structural** • Surgery (sometimes) • Trauma (eg, broken bones, inflammation, extensive dental work)

Multimodal approach for chronic pain

Whitten CE, et al. *Perm J* 2005

Blocking the pain mechanism	Potential multimodal treatments
Prevent peripheral nociception	• Prevent pain: treat early and aggressively • Start low and go slow • Pacing; positioning • Ice • Membrane stabilizers: eg, gabapentin • Mg^{++}, Ca^{++}, vitamin B complex • NSAIDs • Block COX-2 induction in inflammation
Prevent gene transcriptional changes	• TCA, opiates, Ca/Na channel blockers, anticonvulsants • Inhibit COX-2 induction • NMDA antagonists: • methadone, dextromethorphan, ketamine
Membrane stabilizers/decrease membrane excitability	• Local anesthetics • Ca/Na channel blockers, anticonvulsants • TENS/DCS; acupuncture
Increase neuromodulation at multiple sites	• Acupuncture, manual therapies • TENS, DCS • Hypnosis; Distraction • Education, reductions of anxiety/depression • Opiates; TCAs • Have fun • Placebo
Disrupt transmission of peripheral impulse to cord, thalamus, and cortex	• Ablation: Neurolytic, radiofrequency, cryoablation, neurosurgery • Implantable devices