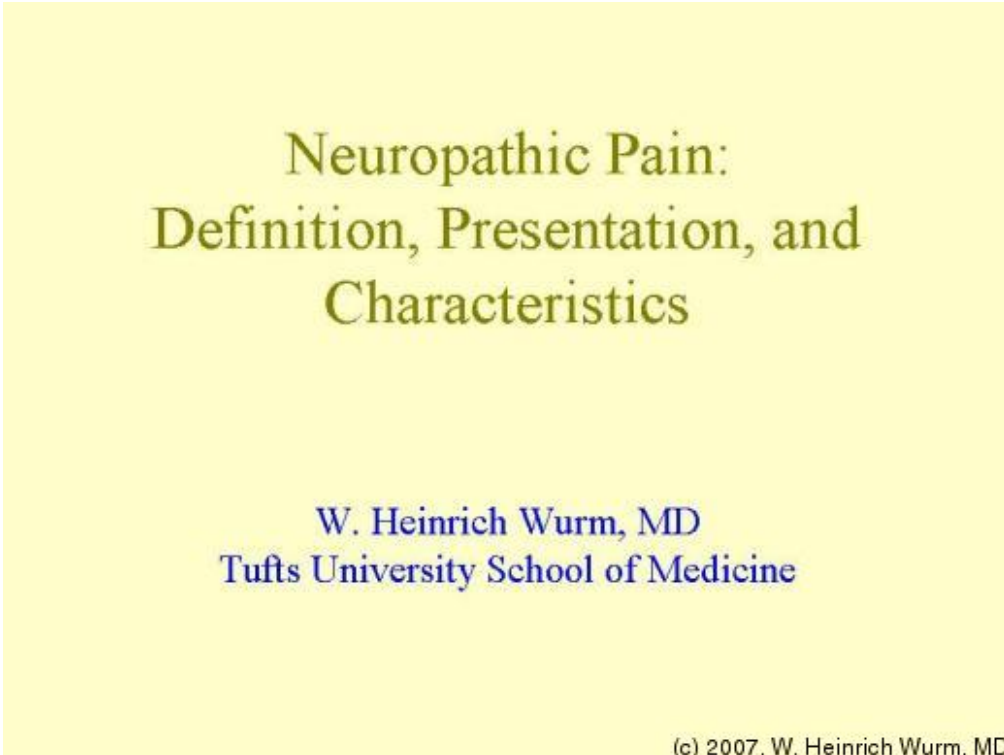


1. Neuropathic Pain: Definition, Presentation, and Characterist...

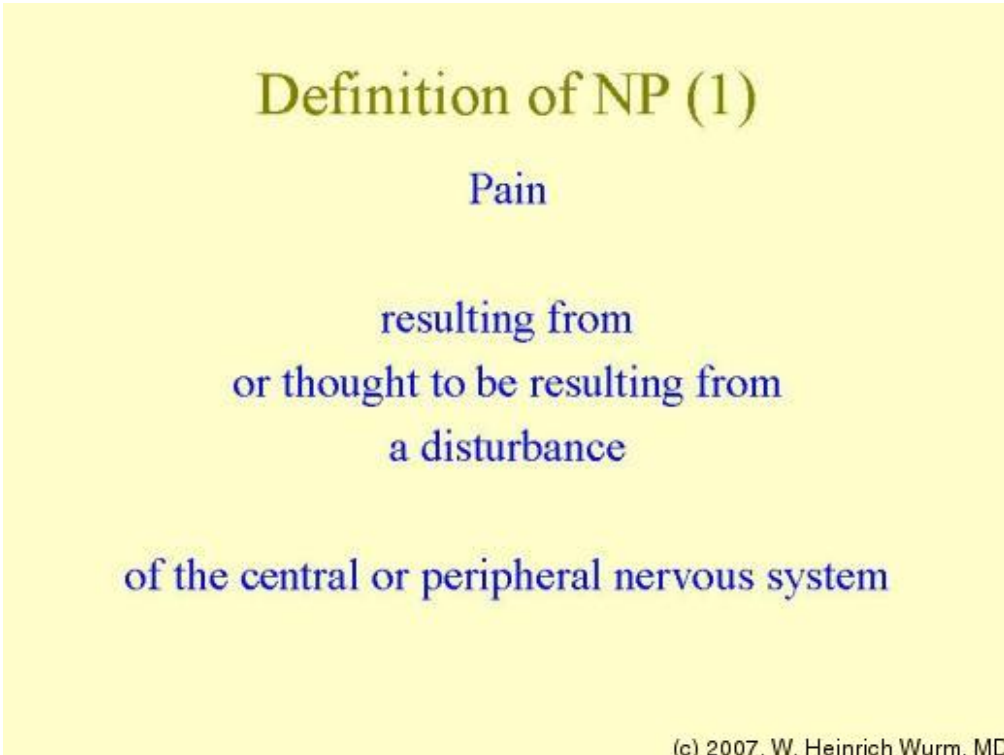


Neuropathic Pain:  
Definition, Presentation, and  
Characteristics

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2. Definition of NP (1)



Definition of NP (1)

Pain

resulting from  
or thought to be resulting from  
a disturbance

of the central or peripheral nervous system

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3. Definition of NP (2)

## Definition of NP (2)

- Pain arising from injury to or abnormal function of the nervous system
  - May be central, peripheral, or both
  - May not be dermatomal
  - May coincide with other types of pain
  - May occur without physical or chemical stimuli
- Pain can be perceived in the absence of nociceptive input

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4. Characteristics of Neuropathic Pain

## Characteristics of Neuropathic Pain

1. Pain is of a burning, gnawing, *aching*, crushing character
2. Pain is an *underlying condition* which is ongoing and more or less constant but can be aggravated or mitigated by maneuvers
3. Spontaneous or evoked *jolts* of pain of lancinating character are typical of neuropathic pain

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5.

## Concomitant Symptoms

### Concomitant Symptoms

- Disturbance of
  - Sleep
  - Mood
  - Recreation
  - Sex life
- Work
- QoL and Function

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6.

## Terms Used to Describe Neuropathic Pain

### Terms Used to Describe Neuropathic Pain

- Allodynia
- Paraesthesia
- Hyperesthesia
- Hyperalgesia
- Hyperpathia
- Hypesthesia
- Paraesthesia

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7.

## Allodynia

### Allodynia

A situation where a normal stimulus elicits an  
abnormal and painful response

Or

Pain due to a stimulus which does not  
normally provoke pain

e.g. touch, light pressure, cold are felt as pain

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8.

## Paresthesia

### Paresthesia

An abnormal sensation, whether spontaneous  
or provoked

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9.

## Hyperesthesia

### Hyperesthesia

Increased sensitivity to stimulation, excluding the special senses

- Requires specific mention of stimulus and location (touch, thermal)
- May be due to diminished threshold to any stimulus and an increased response to stimuli that are normally recognized

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10.

## Hyperesthesia (2)

### Hyperesthesia (2)

Hyperesthesia to Painful Stimulus = Hyperalgesia

Hyperesthesia to Touch = Allodynia

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11. Hyperalgesia

## Hyperalgesia

An increased response to a stimulus which is normally painful

(Increased response to normal threshold or at a normal threshold)

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12. Hyperpathia

## Hyperpathia

A painful syndrome, characterized by increased reaction to a stimulus, especially a repetitive stimulus, as well as an increased threshold.

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13.

## Hypo-esthesia

### Hypo-esthesia

Decreased sensitivity to stimulation,  
excluding the special senses.  
(Stimulation and location to be specified)

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14.

## Hypo-algesia

### Hypo-algesia

Diminished pain in response to a normally  
painful stimulus

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15. **Dysesthesia**

**Dysesthesia**

An unpleasant abnormal sensation, whether  
spontaneous or evoked

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16. **Neuropathic Pain II: Slide 16**

**Neuropathic Pain**

	<b>Threshold and Response</b>	<b>Stimulus and Response</b>
<b>Allodynia</b>	Lowered threshold	Differ
<b>Hyperalgesia</b>	Increased response	Same
<b>Hyperpathia</b>	Raised threshold increased resp.	Same or different
<b>Hypoalgesia</b>	Raised threshold lowered resp.	Same

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17. History of Neuropathic Pain

## History of Neuropathic Pain

- Known to accompany a variety of conditions: diabetes, zoster, persistent radicular pain, obvious nerve injury
- May be a component of pain that has been resistant to routine treatments
- Neuropathic pain may not have been diagnosed previously
- Need to look for specific history and physical findings to highlight presence of neuropathic pain

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18. Conditions Associated with NP

## Conditions Associated with NP

- Diabetic neuropathy
- PNH
- Spinal radiculopathies
- Post thoracotomy, post-mastectomy
- Post herniorrhapy
- Multiple sclerosis
- Post-stroke
- Phantom limb

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19. History and Symptoms

## History and Symptoms

- Pain described as burning, tingling, electric, numb, or shooting
- Patients may be sensitive to cold or heat
- Minor stimuli may provoke pain
- May worsen at night
- Changes in hair, nails, skin (color, sweat)
- Patient may guard and protect extremities

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20. Historical Description of Causalgia

## Historical Description of Causalgia

... Exposure to the air is avoided by the patient with a care that seems absurd, and most of the bad cases keep the hand constantly wet, finding relief in the moisture rather than the coolness of the application.

Two of these sufferers carried a bottle of water and a sponge, and never permitted the part to become dry for a moment. ... The constitutional condition, reacting on the wounded limb, exasperates the hyperesthetic state so that the rattling of a newspaper, a breath of air, the step of another across the ward, the vibrations caused by a military band, or the shock of feet in walking, gives rise to increase of pain.

Source: S. Weir Mitchell 1865 [QUOTED] in Bonica, The Management of Pain, 1953

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21. First Description of Causalgia

## First Description of Causalgia

- Eleven soldiers with gunshot wounds causing major nerve damage (ulnar, median, sciatic)
- Symptoms included pain, allodynia, temperature and trophic changes (hyperhidrosis, skin mottling)
- Weir Mitchell theorized that “nerve irritation as a result of the wound gives rise to changes in circulation and nutrition in its distribution...
- Bonica:... it appears that the local tissue damage, whatever be the agency producing it, initiates a reflex disorder which in some way involves the sympathetic nervous system.

S. Weir Mitchell 1865 [QUOTED] in Bonica, The Management of Pain, 1953

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22. Neuropathic Pain: Physical Examination

## Neuropathic Pain: Physical Examination

- Sudomotor and other changes
- Neurologic deficits
- Allodynia: painful response to normally non-painful stimuli - light touch, cold, vibration
- Hyperalgesia: excessive response to painful stimuli - e.g., more painful pinprick

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23.

## Diagnostic Tests

### Diagnostic Tests

- Important to evaluate underlying illness or abnormality--glucose, heavy metals, arachnoiditis
- May quantify deficits and location--EMG/NCV, possibly SSEP
- May guide further treatment or additional evaluations
- Role of some not clarified: thermography, QSART, etc.

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24.

## Diagnostic Tests: Caveats/Limitations

### Diagnostic Tests: Caveats/Limitations

- Presence of an abnormality does not mean a person has pain
- Abnormal function may be peripheral or in the CNS
- The site of abnormal physiology may not be in the area of pain
- Many tests do not assess physiology

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25.

## Etiology of Neuropathic Pain

### Etiology of Neuropathic Pain

- Metabolic disorders
- Infection
- Injury
- Ischemia
- Drugs or other toxins
- Trauma
- Neurodegenerative disorders
- Hereditary causes

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26.

## Case Study #1: Diabetic Neuropathy

### Case Study #1: Diabetic Neuropathy

73-year-old man with burning pain in feet

- History: worse at night, nocturia, no diagnosis of diabetes. Pain scale 6/10
- Examination: decreased vibration, allodynia on soles of feet, decreased ankle reflex
- Tests: EMG/NCV--c/w peripheral neuropathy, HbA1c = 9.5

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27. Case Study #1: Diabetic Neuropathy

## Case Study #1: Diabetic Neuropathy

### Diabetic neuropathy:

- Often worse at night
- May appear before diagnosis of diabetes mellitus
- Severity of deficits does not correlate with severity of pain
- Pain may decrease as disease progresses
- Diabetes control crucial for pain control

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28. Case Study #2: Phantom Limb Pain

## Case Study #2: Phantom Limb Pain

47-year-old woman with post-traumatic amputation; shooting pain in absent left foot

- History: 9-month history, some stump pain, 3 to 8/10 intensity, limits use of prosthesis
- Examination: well-healed stump, one discrete tender spot
- Tests: good tissue oxygenation of residual limb

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29. Case Study #2: Phantom Limb Pain

## Case Study #2: Phantom Limb Pain

### Phantom limb pain:

- Most common if pre-amputation pain was severe
- More common with co-existent stump pain or poor stump condition
- May be episodic or constant
- Limits function and mobility
- May be resistant to treatment

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30. Case Study #3: Radicular Pain

## Case Study #3: Radicular Pain

38-year-old man with back and right leg pain following lumbar fusion

- History: back and leg pain equal, leg “burns,” unemployed, smoker, pain 5.5/10
- Examination: tender back worsens with extension, equivocal SLR, slight decrease in right lateral foot sensation
- Tests: MRI: surgical changes, scarring

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31.

### Case Study #3: Radicular Pain

## Case Study #3: Radicular Pain

### Pain in a radicular pattern

- May coincide with other types of pain (e.g., myofascial)
- May have soft neurologic findings
- Often not surgical candidates
- Benefit in making more specific diagnoses than “failed back surgery syndrome”

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32.

### Case Study #4

## Case Study #4

32 y.o. woman transferred with excruciating burning in the distribution of the left sciatic nerve 3 weeks after receiving an IM injection of Meperidine and Hydroxyzine .

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33. Case Study #4; Causalgia or Complex Regional Pain Syndrome (...)

### Case Study #4; Causalgia or Complex Regional Pain Syndrome (CRPS) Type 2

- Well-defined history of nerve injury
- Overwhelming pain and suffering
- Burning pain exceeding distribution of affected nerve
- Poor response to opioids
- Scheduled for sympathetic block and possible neurolysis

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34. Case Study #5:

### Case Study #5:

85 y.o. man with history of lung cancer developed herpes zoster (shingles) in the thoracic distribution 3 months ago. After the lesions healed he is left with a constant excruciating pain and sensitivity to touch in the area of the original rash.

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35. Case Study #5: Postherpetic Neuralgia (PNH)

## Case Study #5: Postherpetic Neuralgia (PNH)

- Occurs in 50% of patients who develop shingles over age 70
- Allodynia, hyperpathia and lancinating pain characteristic
- Multimodal therapy combining topical and systemic measures required

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36. Case Study #6

## Case Study #6

A 54 y.o. woman with epilepsy injured her arm during a grand mal seizure and is left with a painfully red and swollen right forearm and hand.

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37.

Case Study # 6:

**Case Study # 6:**  
**CRPS Type 1 (Reflex Sympathetic Dystrophy)**

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38.

Chronic Regional Pain Syndrome

**Chronic Regional Pain Syndrome**

A term describing a variety of painful conditions following injury which appears regionally having a distal predominance of abnormal findings, exceeding in both magnitude and duration the expected clinical course of the inciting event, often resulting in significant impairment of motor function, and showing variable progression over time.

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39. Neuropathic Pain Etiology: Peripheral vs Central Syndromes...

**Neuropathic Pain Etiology:  
Peripheral vs Central Syndromes**

<b>Peripheral syndromes</b>	<b>Central syndromes</b>
<ul style="list-style-type: none"><li>– Metabolic</li><li>– Infectious</li><li>– Toxic</li><li>– Traumatic</li><li>– Neurodegenerative</li><li>– CRPS</li></ul>	<ul style="list-style-type: none"><li>– Injuries</li><li>– Thalamic/ischemic</li><li>– Phantom limb</li></ul>

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40. Neuropathic Pain

**Neuropathic Pain**

Common types of neuropathic pain  
syndromes

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41.

## Summary

### Summary

- Neuropathic pain is caused by injury to or abnormal physiology of the nervous system
- Allodynia may be present
- Multiple complex mechanisms are likely to require multimodality treatment approach (e.g. rational polypharmacy)

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