# Secret Keys to open the lock of Chronic Pain

# Conflict of Interest Declaration: Nothing to Disclose

**Presenter: ___Hadi Shojaei**

- **Title of Presentation: Secret Keys to open the lock of Chronic Pain**

**I have no financial or personal relationship related to this presentation to disclose.**

# Credentials:

Hadi Shojaei, MD
Physical Medicine and Rehabilitation Specialist (PM&R)
Assistant professor, Northern Ontario School of Medicine
Chronic Pain Consultant at St. Joseph's Care Groupe, Chronic Pain Management Program, and Thunder Bay Regional Health Science Centre (TBRHSC)

# Learning Objectives

At the end of this presentation, participants will obtain **Secret Keys** for:

1. Diagnosing different types of chronic non-cancer pain syndromes.
2. Taking history, assessing, and physical examination of chronic pain patients.
3. Identifying pharmacological and non-pharmacological methods of managing the chronic pain.

(You will also learn about the referral system for chronic pain patients in Northwestern Ontario)

**Dr. Angela Mailis - Professor, U of T**

- **Comprehensive Pain Program** (CPP) 1982-2014
- Expanded to involve Fellowship funding in 1990
- I was her Clinical Fellow 2010-2012

**Dr. John Flannery - Professor, U of T**

- **Comprehensive Pain Program** (CPP) 2014-2016
- Move to TRI Jan 2016 & rebranded **Comprehensive Integrated Pain Program (CIPP)**
- I was his Clinical Fellow 2016-2018

# What Doctors Get
# The Globe and Mail: Oct 7, 2014 Letters to the Editor, Re: Doctor No-Solving the Painkiller Crisis

"…..family physicians get fewer than four hours of chronic pain training, yet they manage the bulk of chronic pain patients…."

December 8, 2018: 1 hour MCTU

March 8, 2019: 1:30 Family Resident Program

Today: 1:30 TMA Spring School

April 9, 2019: 1:30 hrs, Educational Rounds, TBRHSC

## Importance of CNCP

*Chronic pain and related suffering and disability represent an accelerating public health concern and a fiscal "**black hole**" in the economy.

*Prevalence rates: vary widely, probably realistically represent 30%-40%.

*Projected expansion of the elderly population, as well as increased survival rates of the disabled population and individuals with previously terminal conditions, will lead to further increases in prevalence.

*Reviews of chronic pain as a secondary problem in patients with a primary disability, such as spinal cord injury, amputation, cerebral palsy, and multiple sclerosis, have demonstrated even higher prevalence rates of intolerable pain (>70%), which can substantially add to disability.

Braddom, PhysMedRehab textbook, Edition, Chapter 42: Chronic Pain, Page 935-6

# Objective#1

-Diagnosing different types of chronic pain syndromes:

*Chronic Pain Syndrome vs Chronic Pain

*Neuropathic Vs Nociceptive pain

*Central Pain

*Secondary Vs Primarily

*Cancer-related pain

Merskey H, Bogduk N: Classification of chronic pain: descriptions of chronic pain syndromes and definitions of pain terms. 1994, International Association for the Study of Pain.

# Chronic Pain syndrome (disease)

# Road Map, Our Tour's STATIONS:

**1- Case 1,2,3**

**2- History**

**3- Questionnaire/Tools**

**4- Phys/Exam**

**5- Common CNCP**

**6- Treatment Plan (Medications/Non-pharmacological)**

# Case 1,

- Ms. XX, 35 year old, assessment of diffuse body pain
- She developed headaches at age 10 and was found to have a brain tumor.
- She underwent brain surgery followed by chemotherapy and radiotherapy.
- Subsequently, she developed right hemiplegia, right arm and leg pain, and gradual onset of lower back pain which spread out to involve the whole body within 6 years.

Continued, case #1,

*She has been on a power wheelchair since age 20.
*Bilateral hip replacement due to avascular necrosis secondary to chemotherapy.
*Several episodes of falls due to right leg weakness
*She sustained a couple of strokes.
*She was diagnosed with rheumatoid arthritis about seven years ago.
*She stated that her pain has been getting worse over the last 6 years.

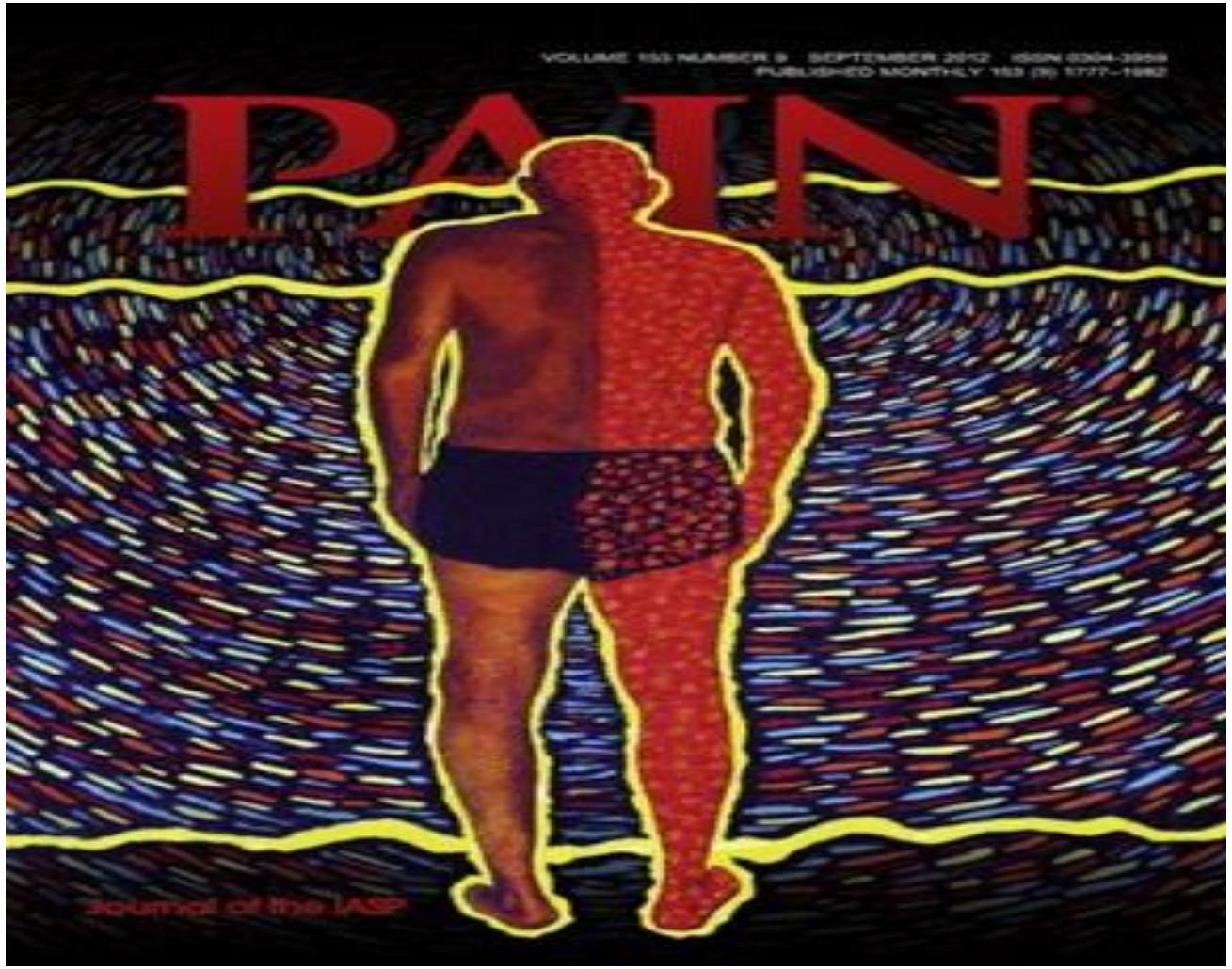
Continued, case #1,

She also stated that her right sided body pain is worse than the left /
She complained of right foot and right hand paresthesia.
Pain ratings: 5/10, fluctuating from 4/10 to 9/10, average at 6/10.
She was not able to name any aggravator of her pain, while medication makes it a little better.

Look at the Body Map:

The official journal of the International Association for the Study of Pain (IASP)

**September 2012 - Volume 153 - Issue 9**



# DDx:

Fibromyalgia?
Autoimmune disease (inflammatory)?
Polyarthritis/Myofacial (non-inflammatory)?
Peripheral Poly Neuropathy (post-chemo/radiotherapy)?
Central post-stroke pain?
Somatic Symptom Disorder with Predominant Pain?

*The assessment of chronic pain involves a thorough history, physical examination, comprehensive evaluation of pain intensity, and psychosocial factors related to ongoing pain experience and interference with sleep, daily activities, family life, and employment.
*Recent data suggest that chronic pain management is best addressed using a biopsychosocial assessment and approach to treatment.

Pain Stages of Change Questionnaire, she scored very high at the precontemplative stage.
BPI score was 63/70 (indicating very high levels of pain interference),
PHQ-9 was 8 (indicating mild depression),
GAD-7 score was 0,
IEQ score was 39 (indicating very high levels of perceived injustice).


Mastercraft
128
C

Continued, case #1, CPS

# PHYSICAL EXAMINATION:

Pleasant, in a power wheelchair, no pain behavior, able to get out of her wheelchair, stand up without kinesophobia, and walk with circumnutated and steppage gait.

**Strength test:** right elbow wrist, knee, ankle, toes: 3/5, but proximal leg and arm: 5/5.

**Sensory examination**, decreased perception to light touch, pin prick, cold and vibration across the right side of her body, including face and abdomen.

**Deep pain sensitivity test**, decreased pressure across the right upper and lower extremities.

**Sitting and supine straight leg raise:** negative bilaterally.

**Spurling's and Lhermitte's sign:** negative bilaterally.

Right **plantar reflex** was extensor.

**Palpation**, a few tender points around her right shoulder and hip

DX?

**Central poststroke pain** (CPSP) is characterized as a constant
or intermittent pain occurring after stroke, which is located in areas of the body that have sensory abnormalitieslike ipsilateral face and contralateral limbs.
(**Thalamic syndrome**: slight hemiplegia, disturbance of superficial and deep sensibility, hemiataxia, hemistereoagnosia, choreoathetoid movements, and intolerable pain).

Although CPSP occurs less frequently than central pain in multiple sclerosis or spinal cord injury, it does have a significant incidence of 8%. The pain can be described as burning (50%), aching (35%), pricking (20%), or lacerating (15%), Changes in temperature, touch, movement, or emotion can worsen pain, whereas rest most commonly relieves pain. Some patients will report that cold, warmth, or movement relieves pain, so gathering a careful history is important.
On examination 72% will have allodynia to movement, touch, thermal stimulation, or a combination of these.

Braddom, PhysMedRehab textbook, 4th Edition, Page 1202

# Pain behavior

Illness behaviors are learned behaviors and are responses that some patients use to convey their distress, indicating pain-related anxiety or anxiety disorder which aggravates pain.

Pain behaviors can also provide insights into environmental influences on the patients' experience of pain and coping with pain. For example, careful observation might reveal that in the presence of well-intentioned, (perhaps overly) solicitous family members, a patient might evidence increased expressions of pain and decreased tolerance of activities.

Illness behaviors are often seen in the patient with chronic pain syndrome. In chronic pain syndrome, the symptoms become the central focus of the patient's life. The behaviors can include grimacing, loud sighing, inconsistency on examination, slow movements, doting family members,etc. Pain management might be the only treatment indicated for ongoing pain; this can be appropriate even after a worker's injury case is "closed." Chronic pain can be associated with depression and anxiety. Patients should be screened for psychologic issues such as borderline personality disorders, somatoform disorders, antisocial personality disorder, and histrionic personality.

Case #2

Ms. YY, 54-y-old female, CC: left entire leg pain

Sudden onset of severe left knee pain **posteriorly** in 2012, gradually spread to involve the entire left leg up to the groin **within a year**, associated with color changes, hypersensitivity, and weakness.

She stated that the left knee is sometimes cold and suddenly changes to heat. She complained of foot paresthesia but no numbness.

Case#2, continued

# She tried knee Cortisone injection, Physiotherapy, Multiple sports specialist, meds, Chronic Pain Management Program in 2013 and 2015.

Pain Stages of Change Questionnaire, very high at the pre-contemplative stage
BPI score was 59/70 (indicating high levels of pain interference, with highest scores for sleep and walking)
GAD-7 score was 11 (indicating moderate anxiety)
PHQ-9 was 19 (indicating moderately severe depression),
IEQ was 36 (high levels of perceived injustice).

PMH: Her left leg was stung by a ? fish at age 4, and was paralyzed for a few days. She continued to have mild and intermittent left leg pain until 2012.
Pain description: very similar to the pain at age 4 associated with color changes and hypersensitivity.

DDX:

CRPS

Monoarthropathy, inflammatory

DJD

Periatrthritis

Chronic compatement syndrome

MPS

Vascular disorder

Leg claudication (radiculopathy)

Peripheral Neuropathy

SSD with PP

Conversion disorder

## Ix:

Left knee MRI in 2015 showed a tiny Baker's cyst, otherwise unremarkable.
Left knee ultrasound study in 2013 was unremarkable.
Left knee and hip x-rays in 2013: normal.
EMG-NCS was unremarkable.
Doppler US : Normal
Head MRI in 2017 was unremarkable.

# Physical Exam:

- General

- Musculoskeletal exam

-Neurologic exam

-Specific tests

- Mood/Affect, Pain Behavior, Kinesophobia, Gait, Transitional movements
- Joints and spine ROM, Sitting and Supine SLR, Specific tests (arthritis vs peri-arthritis)
- Cerebellar, Babinski, Hoffman, Clonus, Motor, DTR, and Sensory:

Light touch

Pinprick

Cold

Vibration

Deep pressure

Temperature

Case#2, continued

She demonstrated multiple pain behaviours, a cane in the right hand, did not sit during the interview, refused to stand on tiptoes or heels, gait was limping with the left leg not-weightbearing and left knee flexed.

No edema, dystrophic or vasomotor changes.

Sensory examination: hypersensitivity to light touch and pinprick across the left entire leg, increased perception of vibration across the left toes, ankle, and knee, and decreased perception of cold across the entire left leg. Temperature measurement, both feet were equal at 31°C.

Strength examination: her left toes and ankle was 3/5 due to pain inhibition.

Deep tendon reflexes were symmetrical.

Left knee flexion range of movement was limited to 90 degrees due to pain, hip ROM was full, however, she complained of left leg.

Sitting and supine SLR was unremarkable.

Plantar reflex was downward, however she complained of hypersensitivity across the left sole.

More investigation? Dx?

Case #3
A-20 y male, Diabetic type I, Anxiety and Depression for 11 years, came for assessment of diffuse body pain.
He first developed bilateral leg pain and paresthesia 1 year ago.
DDX?

He was diagnosed with diabetic peripheral neuropathy and was put on Gabapentin up to 3600 mg, then Morphine Sulfate 20 mg t.i.d, Duloxetine 60 mg, Lorazepam, and Toradol 10 mg, q.i.d

To no avail.

Questions?

Case#3, continued

He was involved in a major psychoemotional trauma.
His dog ran out of the house and was hit by a car.
He was taking his dog, who was alive in his hands, when the driver started arguing with him, instead of having sympathy, according to his mother, and his dog unfortunately passed away.
He denied any **foot** numbness or paresthesia.
Gradually, his pain spread up to involve the entire body within 2 months.

Case#3, continued

## PRESENTING COMPLAINT

-Body map, X on his entire body except chest.
-He selected 14/15 words from the short form of the McGill Pain Questionnaire to describe his pain.
-Stress and doing anything at all make his pain worse, while nothing makes it better.
-Pain ratings: 8/10, fluctuating from 8/10 to 10/10, average at 9/10.
-BPI score was 70/70 (indicating maximum level of pain interference). -Pain Stages of Change Questionnaire: contemplative stage.
-GAD score was 21 and PHQ-9 was 24 (indicating severe depression and anxiety).
-IEQ score was 47 (indicating very high levels of perceived injustice).

Case#3, continued

# PHYSICAL EXAMINATION

He came accompanied by his mother, displayed no physical pain behavior but verbal. Normal gait.

Sensory examination: hypersensitivity to light touch, pinprick and cold all over his body. cold perception was mildly decreased across his foot bilaterally, vibration sense was equal and normal across foot.

DTRs were normal and symmetrical across upper and lower extremities.

Strength test unremarkable. Deep manual pressure test, severe pain in his extremities. Pulses were full and symmetrical. Plantar reflex was flexor bilaterally. On palpation, he did not complain of muscle tender points, however, however, he complained of hypersensitivity to touch (allodynia).

Case#3, continued

He may have had diabetic peripheral polyneuropathy, but his dog overall MVA was quite psychotraumatic.

His symptoms qualifies him for DSM 5 diagnosis of Somatic Symptoms Disorder (SSD) with Predominant Pain, associated with PTSD, Anxiety, and Major Depression.

SSD and chronicity with low pain threshold are barriers and poor prognostic signs. However, given his young age, I recommended our interprofesional chronic pain management program including psychology, psychotherapy, exercise, and aquatherapy. I recommended that he attend a warm pool for more aqua therapy to help him with desensitization.

# Pain relies on context

- Sensory cues need to be evaluated by your brain including:

Memory

Reasoning =cerebral cortex

Emotional

A minor finger injury in a violinist or a dancer. If someone tickles you…

- (amygdala= basic emotions: sex, anger, fear. larger in male brain) (hippocampus=memory)(orbitofreontal=social emotional response), anger(prefrontal=executive and logical)(frontal=planning)(anterior cingulate=motivation)(parietal=movement)(temporal=language)e s(brain stem= heat, breathing, digesting, sleeping)(cortex= state of consciousness, senses, motor skills, reasoning, language)(hypothalamus= blood pressure, body temperature, weight, appetite)

# What affects your experience of pain?

The gate control theory helps explain how the brain influences your experience of pain. It seems that several factors can affect how you interpret pain:

- emotional and psychological state;
- memories of previous pain;
- upbringing;
- expectations of and attitudes towards pain;
- beliefs and values;
- age;
- sex;
- social and cultural influences.

Hence the experience of pain differs from person to person.

# Peripheral Sensitization

C fibers and A delta receptors undergo changes in response to tissue injury such as chronic inflammation, ischemia, and compression, by the release of chemical mediators such as PGs, Bradykinin, etc., so called “inflammatory soup”: rich in analgesic substances, causes a lowering threshold for activation and subsequent evoked pain. C fibers release excitatory amino acids and neuropeptides (Substance P, CGRP, neurokinin) and is called “neurogenic inflammation”, which excites other nearby nociceptors, exhibit neuroplasticity, enhancing pain signals and producing hypersensitivity

(Braddom PMR, 4th Edition, chronic pain chapter, page 941)

# Peripheral Sensitization

- Bradykinin increases pain sensitivity via a glutamate-dependent activation of the N-methyl-aspartate (NMDA) receptor. Bradykinin can provoke substance P (SP) release, and both can trigger mast cell secretion…….

“Inflammatory Soup” Mediators of inflammation in CRPS,

Lay-out Wendy Groeneweg, 2008

# Central Sensitization

- The central nervous system adapts adversely to repetitive pain impulses after prolonged stimulation of nociceptors, causing nervous system's architecture and thereby pain processing change. When spinal neurons are subjected to repeat or high-intensity nociceptive impulses, they become progressively and increasingly excitable even after the stimulus is removed. This condition is known as **central sensitization (ie, wind-up phenomenon)** and leads to nonresponsive or chronic intractable pain.

# Central Sensitization(continued)

- Wind-up is the culmination of two distinct phases of change in the nervous system: First, pain-transmitting nerve fiber threshold is reset. This resetting results in **hyperalgesia**, where less and less stimulation is required to initiate pain. Second phase: nerve fibers that normally carry non painful information are recruited and become part of the pain-transmission process. This phase is termed **allodynia** and results in normally harmless sensations being interpreted as pain. The presence of hyperalgesia and allodynia collectively is considered wind-up phenomenon.
- This phenomenon highlights the need for preemptive analgesia to treat pain before it begins and at regular intervals postoperatively.

# Central Sensitization(continued)

- Wind-up Phenomenon: Steady release of substance P in the dorsal horns, removed **slowly** and **diffuse** around, lead to cellular changes such as increased neuronal sprouting.
- Other cellular changes might follow from activation of NMDA receptors which only open with prolonged depolarization, such as prolonged pain. The resulting influx of Ca++ could activate enzymes (such as nitric oxide synthase) or trigger other long lasting cellular changes, functionally and physically.

# CNS Changes

- Pain inhibition; Descending neural inhibitory control (5HT, NA, EnK, …)
- Spinal Changes: **wide dynamic range neuron** (WDR) neurons prioritize pain signals; Ephaptic crosstalk occur; Interneurons opioid receptors downgrade; Reduced activity of Diffuse Noxious Inhibitory Controls (DNIC)
- Brain Changes: regions, not previously involved, are now recruited, brain volume lost, central glial cells become activated

(from Dr. Marks De Chabris' slides last year)

The basic concept is that non-painful stimuli block the pathways for painful stimuli, inhibiting possible painful responses. This theory was supported by the fact that WDR neurons are responsible for responses to both painful and non-painful stimuli, and the idea that these neurons couldn't produce more than one of these responses simultaneously. WDR neurons respond to all types of somatosensory stimuli, electrical, mechanical, and thermal,….The dorsal cord has faulty plasticity, which encourages the development of neuropathic pain after an injury to a nerve: over-excitation, resulting in chronic pain.

# Review Our Road Map again, Our Tour's STATIONS:

**1- History**

**2- Questionnaire/Tools**

**3- Phys/Exam**

**4- Treatment Plan**

**5- Patients education**

**6- Medications**

# History

**- Inciting Event**

- Mechanism of injury
- Work-related
- MVA
- Legal action?
- Previous treatments

- R/O the RED FLAGES
- **First secret Key** in Chronic Non Cancer Pain

Case#1 and 2

# History

- Inciting Event
- **Mechanism of injury**
- Work-related
- MVA
- Legal action?
- Previous treatments

- Very important
- **Second secret key**,
- Ask patient to show you
- Many examples

# History

- Inciting Event
- Mechanism of injury
- **Work-related**
- MVA
- Legal action?
- Previous treatments

- Very important
- Ask patient to show you
- WSIB?
- **3rd secret key: Patient's expectation**
- Plan of returning to work?

# History

- Inciting Event
- Mechanism of injury
- **MVA**
- Legal action?
- Previous treatments

- Impact evaluation, physical and emotional (a **secret key)**
- Pain before the MVA
- After the MVA

# History

- Inciting Event
- Mechanism of injury
- MVA
- **Legal action?**
- Previous treatments

- Case is open? Secret Key
- Closed?
- Lawyer?
- Expectation?
-

# History

- Inciting Event
- Mechanism of injury
- MVA
- Legal action?
- **Previous treatments**

(A Secret Key)

- Physiotherapy
- Chiropractic
- Osteopathy
- Acupuncture
- Massage Therapy
- Occupational therapy
- Intervention
- etc

# Associated Symptoms:
# Secret Key

Sleep

Bowel movement

Bladder

Fatigue

Libido

Tinnitus

dizziness

Headaches

Weight

# Questionnaires/ Tools

- PSCQ
- SF-Mac Gill Pain
- BPI
- GAD-7
- PHQ-9
- IEQ

Pain stage of Change Questionnaire

Pre-Contemplative
Contemplative
Action
Maintenance

# Questionnaires/ Tools

- PSCQ
- SF-Mac Gill Pain
- BPI
- GAD-7
- PHQ-9
- IEQ

## Short-Form McGill Pain Questionnaire

**Short-Form McGill Pain Questionnaire**

PATIENT'S NAME: _____ DATE: _____

| | NONE | MILD | MODERATE | SEVERE |
|---|---|---|---|---|
| THROBBING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SHOOTING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| STABBING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SHARP | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| CRAMPING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| GNAWING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| HOT/BURNING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| ACHING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| HEAVY | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| TENDER | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SPLITTING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| TIRING/EXHAUSTING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| SICKENING | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| FEARFUL | 0) _____ | 1) _____ | 2) _____ | 3) _____ |
| PUNISHING/CRUEL | 0) _____ | 1) _____ | 2) _____ | 3) _____ |

VAS NO PAIN — WORST POSSIBLE PAIN

PPI

0 NO PAIN _____
1 MILD _____
2 DISCOMFORTING _____
3 DISTRESSING _____
4 HORRIBLE _____
5 EXCRUCIATING _____

© R. Melzack 1984

The short-form McGill Pain Questionnaire (SF-MPQ). Descriptors 1–11 represent the sensory dimension of pain experience and 12-15 represent the affective dimension. Each descriptor is ranked on an intensity scale of 0 = none, 1 = mild, 2 = moderate, 3 = severe. The Present Pain Intensity (PPI) of the standard long-form McGill Pain Questionnaire (LF-MPQ) and the visual analogue scale (VAS) are also included to provide overall intensity scores.

# Questionnaires/ tools

- SF-Mac Gill Pain
- BPI
- GAD-7
- PHQ-9
- IEQ

Date: _____

Subject ID: _____

**Short-form McGill Pain Questionnaire 2 (SF-MPQ-2)**

For this questionnaire, I will provide you a list of words that describe some of the different qualities of pain and related symptoms. Please rate the intensity of each of the pain and related symptoms you felt during the past week on 0 to 10 scale, with 0 being no pain and 10 being the worst pain you can imagine. Use 0 if the word does not describe your pain or related symptoms. Limit yourself to a description of the pain related to your surgery or pelvic pain.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Throbbing pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **2. Shooting pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **3. Stabbing pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **4. Sharp pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **5. Cramping pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **6. Gnawing pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **7. Hot-burning pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **8. Aching pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **9. Heavy pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **10. Tender** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **11. Splitting pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **12. Tiring-exhausting** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **13. Sickening** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **14. Fearful** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **15. Punishing-cruel** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **16. Electric-shock pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **17. Cold-freezing pain** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **18. Piercing** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **19. Pain caused by light touch** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **20. Itching** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **21. Tingling or 'pins and needles'** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |
| **22. Numbness** | *none* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |

**23. Present Pain Intensity (PPI)** – Numerical Pain Rating Scale. On a scale from zero to ten, zero indicating no pain and ten indicating worst pain imaginable, rate your pelvic pain:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *None* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *worst possible* |

**24. Evaluative overall intensity of total pain experience. Please check ( √ ) the word that describes the pain in your pelvic area only.**

D *No pain* D *Mild* D *Discomforting* D *Distressing* D *Horrible* D *Excruciating*

# Questionnaires/ tools

- SF-Mac Gill Pain
- Brief Pain Inventory (BPI)
- GAD-7
- PHQ-9
- IEQ

1903

Date: ___ / ___ / ___ (month) (day) (year)

Subject's Initials : _____

Study Subject #: _____

PLEASE USE BLACK INK PEN

Study Name: _____

Protocol #: _____

PI: _____

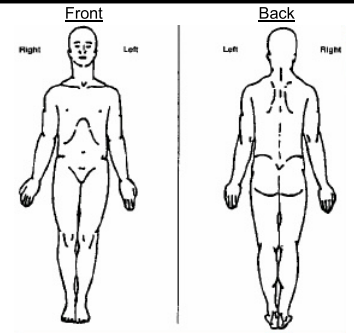
Revision: 07/01/05

## Brief Pain Inventory (Short Form)

**1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?**

☐ Yes ☐ No

**2. On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.**




**3. Please rate your pain by marking the box beside the number that best describes your pain at its worst in the last 24 hours.**

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

**4. Please rate your pain by marking the box beside the number that best describes your pain at its least in the last 24 hours.**

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

**5. Please rate your pain by marking the box beside the number that best describes your pain on the average.**

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

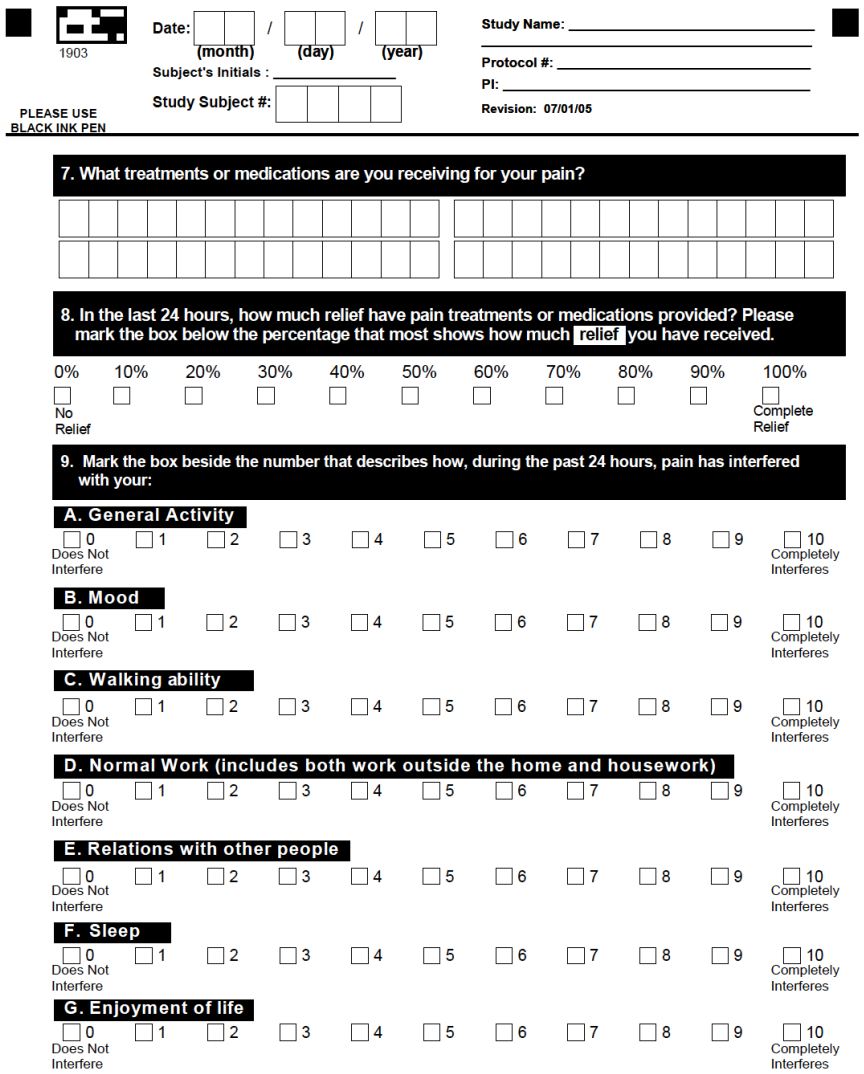
**6. Please rate your pain by marking the box beside the number that tells how much pain you have right now.**

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain — Pain As Bad As You Can Imagine

# Questionnaires/ Tools

- SF-Mac Gill Pain
- **Brief Pain Inventory (BPI)**
- GAD-7
- PHQ-9
- IEQ



1903

Date: (month) / (day) / (year)

Subject's Initials : _____

Study Subject #:

PLEASE USE BLACK INK PEN

Study Name: _____

Protocol #: _____

PI: _____

Revision: 07/01/05

**7. What treatments or medications are you receiving for your pain?**

**8. In the last 24 hours, how much relief have pain treatments or medications provided? Please mark the box below the percentage that most shows how much relief you have received.**

0% ☐ No Relief | 10% ☐ | 20% ☐ | 30% ☐ | 40% ☐ | 50% ☐ | 60% ☐ | 70% ☐ | 80% ☐ | 90% ☐ | 100% ☐ Complete Relief

**9. Mark the box beside the number that describes how, during the past 24 hours, pain has interfered with your:**

**A. General Activity**

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

**B. Mood**

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

**C. Walking ability**

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

**D. Normal Work (includes both work outside the home and housework)**

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

**E. Relations with other people**

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

**F. Sleep**

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

**G. Enjoyment of life**

☐ 0 Does Not Interfere ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Completely Interferes

# Questionnaires/ tools

- SF-Mac Gill Pain
- **Brief Pain Inventory (BPI)**
- GAD-7
- PHQ-9
- IEQ

Generalized Anxiety Disorder 7-item (GAD-7) scale

| Over the last 2 weeks, how often have you been bothered by the following problems? | Not at all sure | Several days | Over half the days | Nearly every day |
|---|---|---|---|---|
| 1. Feeling nervous, anxious, or on edge | 0 | 1 | 2 | 3 |
| 2. Not being able to stop or control worrying | 0 | 1 | 2 | 3 |
| 3. Worrying too much about different things | 0 | 1 | 2 | 3 |
| 4. Trouble relaxing | 0 | 1 | 2 | 3 |
| 5. Being so restless that it's hard to sit still | 0 | 1 | 2 | 3 |
| 6. Becoming easily annoyed or irritable | 0 | 1 | 2 | 3 |
| 7. Feeling afraid as if something awful might happen | 0 | 1 | 2 | 3 |
| *Add the score for each column* | + | + | + | |
| Total Score *(add your column scores)* = | | | | |

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all _____
Somewhat difficult _____
Very difficult _____
Extremely difficult _____

# 3-Questionnaires/ tools

- SF-Mac Gill Pain
- **Brief Pain Inventory (BPI)**
- GAD-7
- PHQ-9
- IEQ

## Patient Health Questionnaire (PHQ-9)

Name: _____ Date: _____

| Over the last 2 weeks, how often have you been bothered by any of the following problems? | Not at all | Several days | More than half the days | Nearly every day |
|---|---|---|---|---|
| 1. Little interest or pleasure in doing things | 0 | 1 | 2 | 3 |
| 2. Feeling down, depressed, or hopeless | 0 | 1 | 2 | 3 |
| 3. Trouble falling or staying asleep, or sleeping too much | 0 | 1 | 2 | 3 |
| 4. Feeling tired or having little energy | 0 | 1 | 2 | 3 |
| 5. Poor appetite or overeating | 0 | 1 | 2 | 3 |
| 6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down | 0 | 1 | 2 | 3 |
| 7. Trouble concentrating on things, such as reading the newspaper or watching television | 0 | 1 | 2 | 3 |
| 8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual | 0 | 1 | 2 | 3 |
| 9. Thoughts that you would be better off dead or of hurting yourself in some way | 0 | 1 | 2 | 3 |

For office coding: Total Score _____ = _____ + _____ + _____

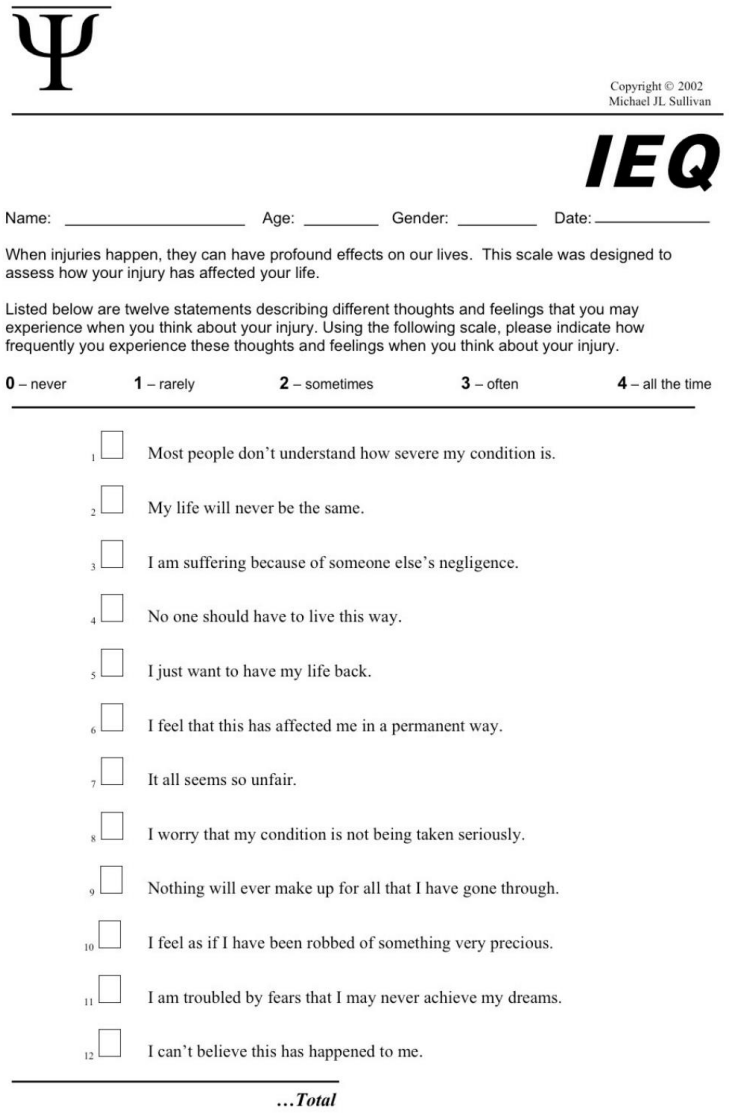
Total Score _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult

# Questionnaires/ tools

- SF-Mac Gill Pain
- Brief Pain Inventory (BPI)
- GAD-7
- PHQ-9
- IEQ



Ψ



**IEQ**

Name: _____ Age: _____ Gender: _____ Date: _____

When injuries happen, they can have profound effects on our lives. This scale was designed to assess how your injury has affected your life.

Listed below are twelve statements describing different thoughts and feelings that you may experience when you think about your injury. Using the following scale, please indicate how frequently you experience these thoughts and feelings when you think about your injury.

**0** – never **1** – rarely **2** – sometimes **3** – often **4** – all the time

1. ☐ Most people don't understand how severe my condition is.
2. ☐ My life will never be the same.
3. ☐ I am suffering because of someone else's negligence.
4. ☐ No one should have to live this way.
5. ☐ I just want to have my life back.
6. ☐ I feel that this has affected me in a permanent way.
7. ☐ It all seems so unfair.
8. ☐ I worry that my condition is not being taken seriously.
9. ☐ Nothing will ever make up for all that I have gone through.
10. ☐ I feel as if I have been robbed of something very precious.
11. ☐ I am troubled by fears that I may never achieve my dreams.
12. ☐ I can't believe this has happened to me.

***…Total***

# Native Wild Flowers Thunder Bay

# Physical Exam:

- **General**

- Musculoskeletal exam

-Neurologic exam

-Specific tests

- Mood/Affect
- Pain Behavior
- Kinesophobia
- Gait
- Transitional movements

# Physical Exam:

- General
- **Musculoskeletal exam**

Neurologic exam

Specific tests

- Joint ROM,
- SLR, Sitting and Supine
- Specific tests

Neck

Shoulder

Wrist

Spine (pain with spinal origin)

Hip/SIJ

Knee/ankle

(arthritis vs peri-arthritis)

# Physical Exam:

- General
- Musculoskeletal exam
- **Neurologic exam**
- Specific tests

- Motor
- DTR
- Sensory:

Light touch
Pinprick
Cold
Vibration
Deep pressure
Temperature
Babinski, Hoffman’s, Clonus,…

Sensory Body Map :

Pain areas

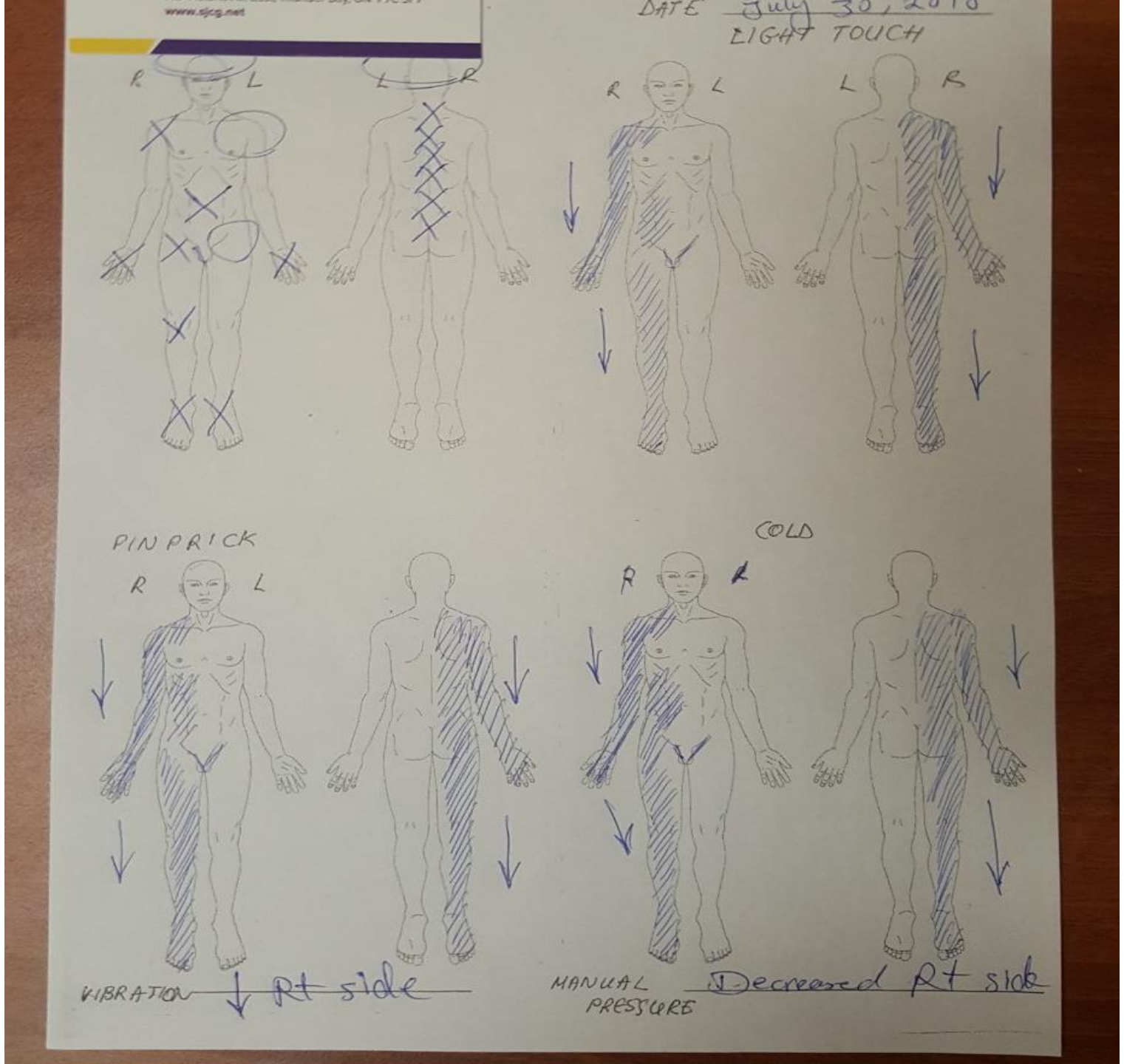
Light Touch

Pin Prick

Cold

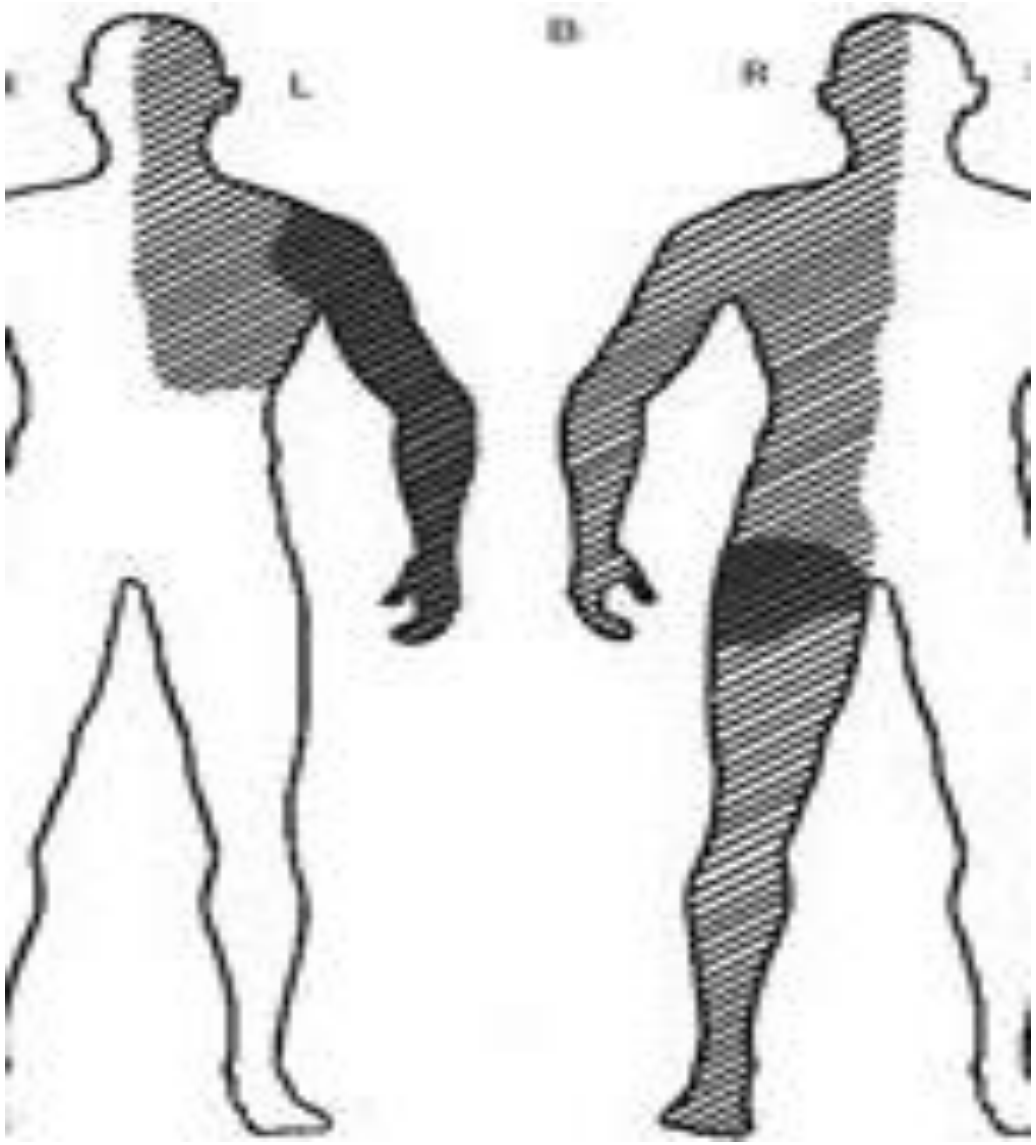
Vibration

Deep Pressure

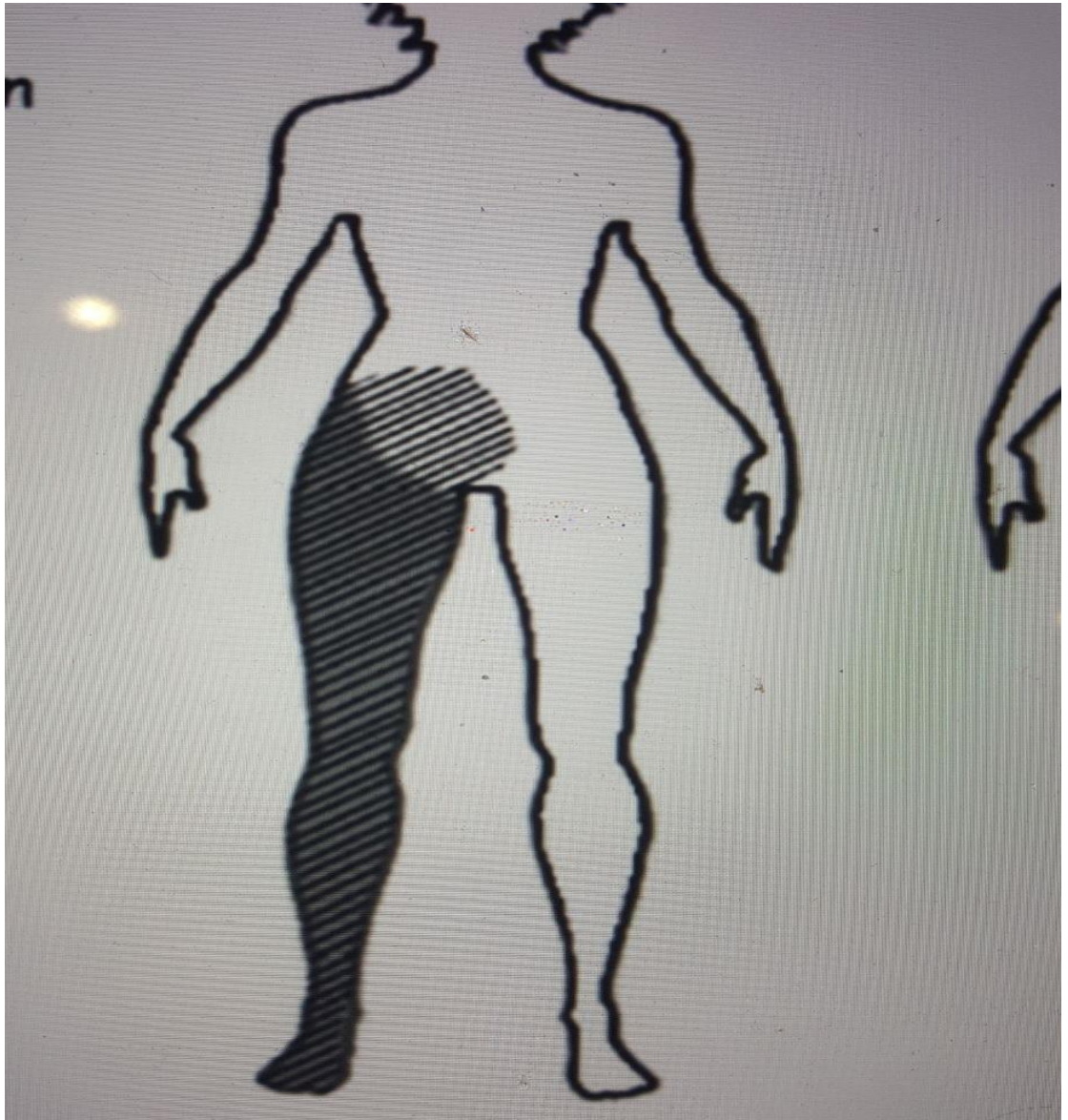


Upper Quadratomal Sensory Deficit

Hemibody Sensory Deficit



Lower Quadratomal Sensory Deficit



# Nondermatomal Somatosensory Deficits (NDSDs)

- Definition of NDSD
- NDSD Characteristic
- Mechanism of NDSD
- Prevalence of NDSD
- Etiology
- Pathophysiology
- Cases
- Treatment
- Prevention

# Definition:

Reduced cutaneous sensation to multiple modalities:
light touch,
pinprick,
cold,
vibration,
deep manual pressure

***Most patients are unaware of NDSDs (discovery of NDSD during examination)***

1-Hypoalgesia to pinprick in 100% of the subjects with NDSDs,

2-Hypoesthesia to light touch in 94.7%,

3-Hypoesthesia to cold in 89.4%,

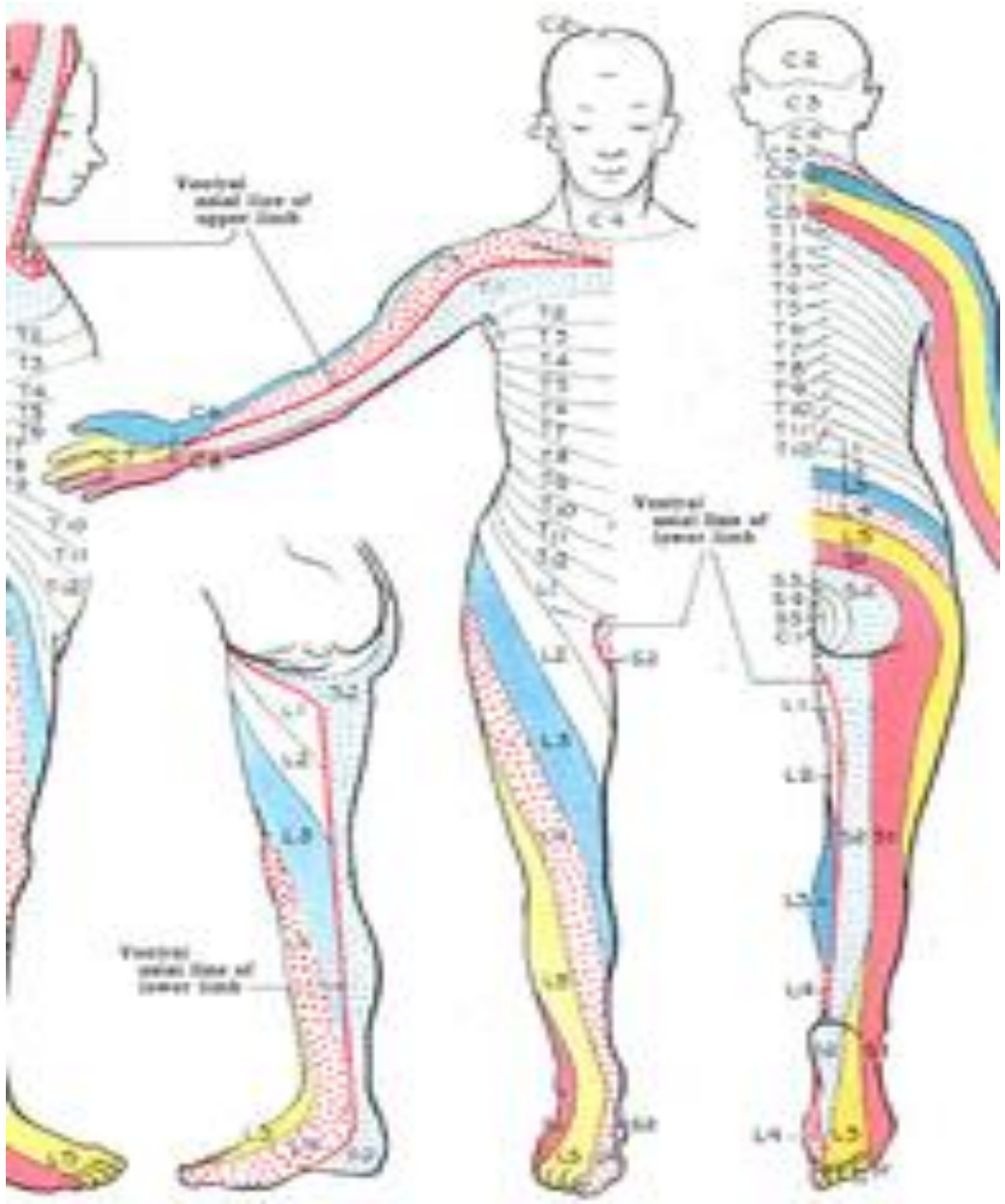
4-Reduction to vibration sense in 81.5%,

5-Deep manual pressure reduced in 65.8%

# Peripheral Neuropathy, Radiculopathy, Plexopathy

Upper motor neuron disease

Lower motor neuron disease



Sensory Body Map :

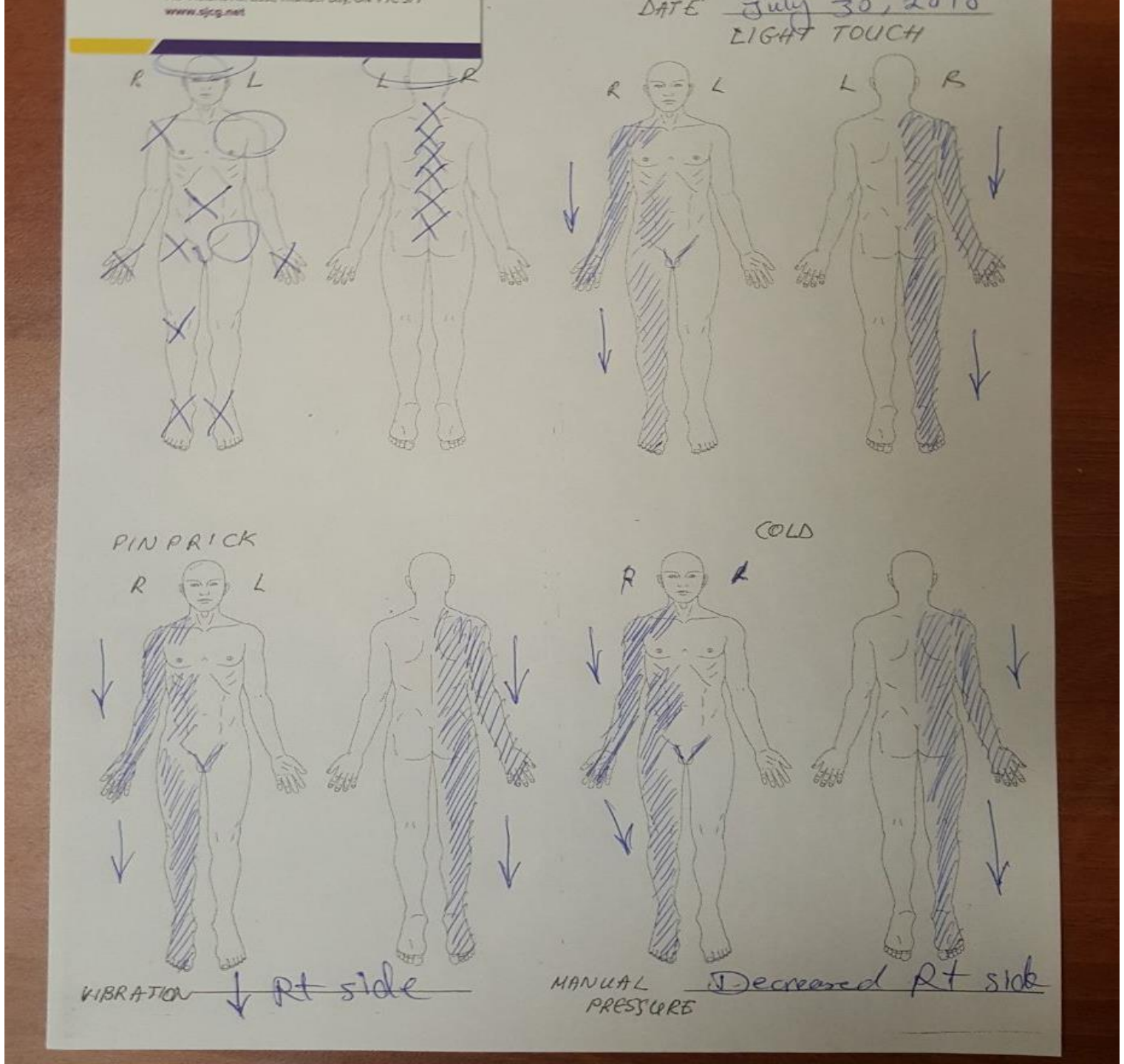
LT

PP

Cold

Vibration

Deep Pressure



# NDSD Characteristic

**Intensity:**

- Very Mild reduction
- Mild
- Moderate
- very dense
- (complete anesthesia)

**Variability over time**

- Highly variable
- Extremely fixed
- NDSD size tends to increase or decrease in tandem with pain intensity
- NDSD borders can be ill-defined or sharply demarcated across large nonanatomical areas,

# Onset and Temporal Characteristics

* The majority of NDSDs seem to develop gradually after an inciting event (in parallel with worsening and spreading pain).
* The inciting event is usually minor but almost always associated with an intense psychotraumatic experience (MVA, workplace accidents, unexpected threat, embarrassment, perception of injustice,…. )
* Sometimes, they appear in the context of prolonged, psychotraumatic experiences (PTSD, Abuse, Anxiety, Depression,..)

# Prevalence

Fishbain et al. (1991) reported 40% of 247 primarily myofascial pain patients had NDSAs. Interestingly, these abnormalities were much more prevalent in patients with workers compensation or ongoing litigation claims (77%) than those patients without (23%),

Kajiyama, et al (1999) reported hemibody hypoalgesia to pinprick at the side of more intense pain in 38% of 76 patients with fibromyalgia,

Mailis et al. (2001) found hemisensory or quadrotomal deficits (NDSDs) to pinprick, light touch, andcold perception in 25% at the side of worst pain in a consecutive series of 194 patients.

Arvantaj, et al (2008) found NDSDs in 45% of 184 injured workers

# Prevalence in normal population

There is very little, if any, information about what the prevalence of NDSDs may be in other patient populations or the general population. Nonetheless, it is apparent that NDSDs are strongly associated with chronic pain and that NDSDs are common in all chronic pain patient groups.

# Etiology

*No structural peripheral or central nervous system lesions
*Psychological factors are believed to be contributory in the onset, exacerbation, severity, o maintenance of the NDSDs.
*Under a multiplicity of emotionally charged conditions or certain personality organizations, dynamic aberrations of brain function can occur in individuals utilizing specific mechanisms to avoid unpleasant physical or emotional events.
*Magnitude of original trauma or inciting event and the duration of actual nociception may be insignificant or minor

# NDSD - FMRI

Unperceived stimuli applied to anesthetic body parts failed to activate areas that are normally activated with perceived touch and pain, notably, the thalamus, posterior region of the anterior cingulate cortex (ACC), and Brodmann's area (BA) 44/45. Furthermore, unperceived stimuli were associated with deactivations in primary and secondary somatosensory cortex (S1, S2), posterior parietal cortex (PPC), and prefrontal cortex (PFC). Finally, unperceived (but not perceived) stimuli activated the rostral and perigenual ACC.

Given the findings of rostral and perigenual ACC activation during unperceived brush or noxious stimulation, it was suggested that patients may be directing attention toward the ongoing pain, which could attenuate stimulus-evoked activation resulting from an attention switch. Rostral regions of the ACC , including the perigenual ventral portion, are indeed thought to be involved in cognitive processes and emotion and are part of the medial pain system (Vogt, Sikes, & Vogt,1993).

# Pathophysiology of NDSD

NDSDs are due to ***maladaptive neuroplasticity*** and represent a failed attempt by the brain to shut down somatosensory input in an attempt to control pain NDSDs are examples of “functional deafferentation” (as opposed to structural deafferentation, e.g., brachial plexus avulsion). It is a product of a central neurophysiological phenomenon

# NDSD

- (a) has a psychobiological substrate at the level of the CNS,
- (b) very frequently associated with **chronic pain** and/or psychotraumatic experiences,
- (c) occur very frequently in the context of conversion disorder, but
- (d) can also occur in the absence of conversion disorders,
- (e) can be superimposed on structural neurological deficits,
- (f) respond positively, or at least in part, to sodium amobarbital (commonly referred to as the “truth serum)

# References


- Nondermatomal Somatosensory Deficits (NDSDs) and Pain: State-of-the-Art Review

Angela Mailis & Keith Nicholson

Psychol. Inj. and Law (2017) 10:313–329

- Nondermatomal somatosensory deficit: Overview of unexplainable negative sensory phenomena in chronic pain patients

Angela Mailis & Keith Nicholson

Current opinion in Anaesthesiology 2010 23:593-597

# Common/Complex CNCP

- Widespread body pain (Fibromyalgia)
- Myofascial Pain Syndromes
- CRPS
- Opioid Induced Hyperalgesia
- Functional neurologic disorder
- Somatic Symptom Disorder with Predominant Pain
- Severe OA
- Neuropathy

# OA : mechanical disorder *par excellence*

- Pain-killing techniques are usually harmful for the joint
- Explaining the physiology of pain is the best treatment for the prevention of fast degradation of the joint.
- degeneration of the cartilage: primary (related to age or menopause) or secondary (related to mechanical effort, metabolic disorders, or genetic malformation, inflammatory arthritis, infectious arthritis)

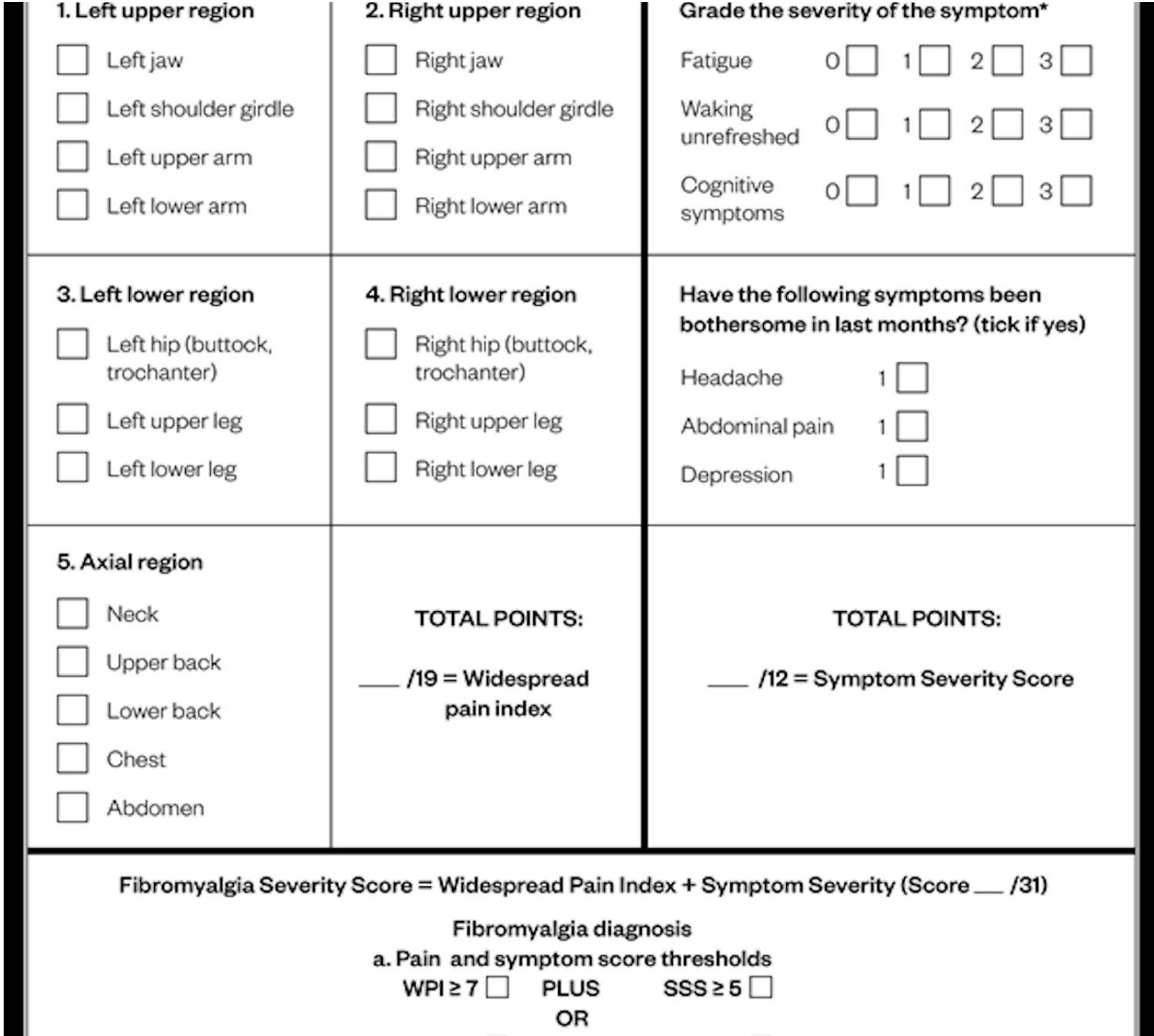
# Neuropathic Pain

Recommendations for treatment are based on degree of evidence of analgesic efficacy, safety, ease of use and cost-effectiveness

- Prevalence : 2-3%. 50% of DM but 10% complain.
- First-line : TCA, Gabapentin / Pregabalin.
- Second-line: SNRI, Topicals (lidocaine,…).
- Third-line: Tramadol, controlled-release Opioid analgesics
- Fourth-line : Cannabinoids, Methadone and anticonvulsants with lesser evidence of efficacy (lamotrigine, topiramate and valproic acid)
- Non-pharmacological:

# Fibromyalgia

- 1) Widespread pain index (WPI) ≥7 and symptom severity scale (SSS) score ≥5 OR WPI 4–6 and SSS score ≥9.
- 2) Generalized pain, defined as pain in at least 4 of 5 regions, is present.
- 3) Symptoms have been present at a similar level for at least 3 months.
- 4) A diagnosis of fibromyalgia is valid irrespective of other diagnoses. A diagnosis of fibromyalgia does not exclude the presence of other clinically important illnesses.



**1. Left upper region**

- ☐ Left jaw
- ☐ Left shoulder girdle
- ☐ Left upper arm
- ☐ Left lower arm

**2. Right upper region**

- ☐ Right jaw
- ☐ Right shoulder girdle
- ☐ Right upper arm
- ☐ Right lower arm

**Grade the severity of the symptom***

| | | | | |
|---|---|---|---|---|
| Fatigue | 0 ☐ | 1 ☐ | 2 ☐ | 3 ☐ |
| Waking unrefreshed | 0 ☐ | 1 ☐ | 2 ☐ | 3 ☐ |
| Cognitive symptoms | 0 ☐ | 1 ☐ | 2 ☐ | 3 ☐ |

**3. Left lower region**

- ☐ Left hip (buttock, trochanter)
- ☐ Left upper leg
- ☐ Left lower leg

**4. Right lower region**

- ☐ Right hip (buttock, trochanter)
- ☐ Right upper leg
- ☐ Right lower leg

**Have the following symptoms been bothersome in last months? (tick if yes)**

| | |
|---|---|
| Headache | 1 ☐ |
| Abdominal pain | 1 ☐ |
| Depression | 1 ☐ |

**5. Axial region**

- ☐ Neck
- ☐ Upper back
- ☐ Lower back
- ☐ Chest
- ☐ Abdomen

**TOTAL POINTS:**

**___ /19 = Widespread pain index**

**TOTAL POINTS:**

**___ /12 = Symptom Severity Score**

**Fibromyalgia Severity Score = Widespread Pain Index + Symptom Severity (Score ___ /31)**

**Fibromyalgia diagnosis**

**a. Pain and symptom score thresholds**

**WPI ≥ 7 ☐ PLUS SSS ≥ 5 ☐**

**OR**

Definition of Fibromyalgia Syndrome

FMS is a generalized chronic pain syndrome characterized by widespread pain and tenderness to palpation at multiple anatomically defined soft tissue body sites.163 Its comorbidities include depression, anxiety, insomnia, cognitive dysfunction, chronic fatigue, endocrinopathies, irritable bowel syndrome, and dysfunction of the autonomic system. Primary FMS is defined as “pure” FMS having no association with any other medical condition. In some patients, FMS can accompany and complicate a variety of medical conditions, such as rheumatoid arthritis, systemic lupus erythematosus, and hypothyroidism. FMS associated with another medical condition is secondary FMS.

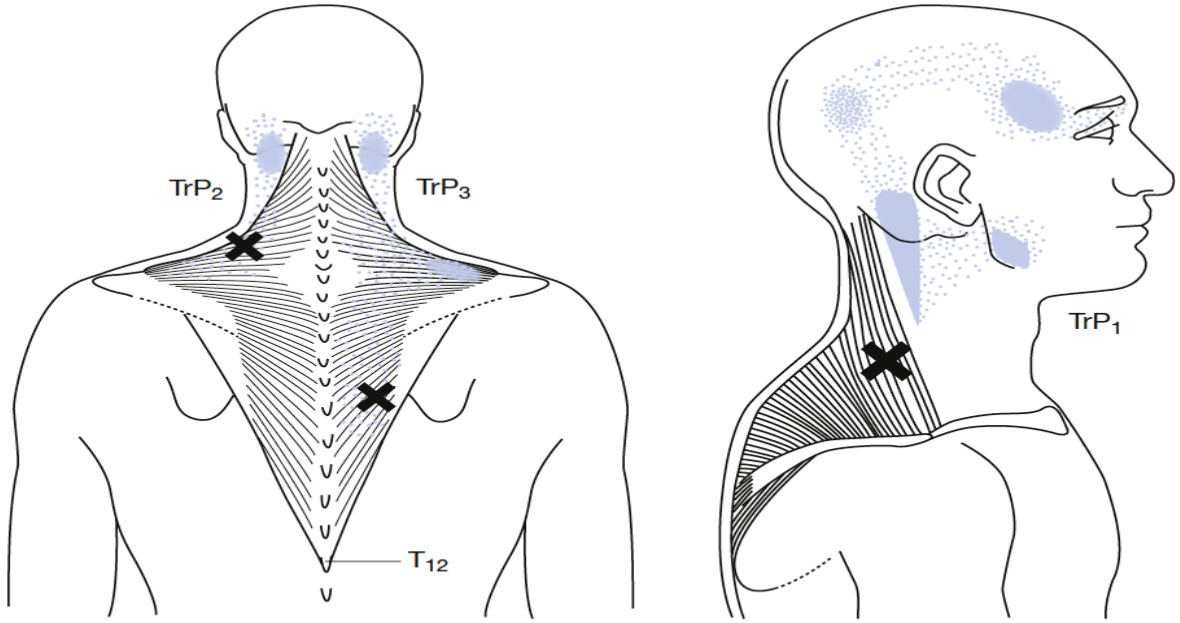



**FIGURE 43-10 Referred pain pattern of myofascial trigger points in the upper trapezius muscle.** (Modified from Simons DG, Travell JG, Simons LS: trapezius muscle. In *Travell & Simons' myofascial pain and dysfunction: the trigger point manual,* vol 1, ed 2, Baltimore, 1999, Williams & Wilkins, with permission.)

### *Local Twitch Responses*

LTR is a sudden brisk contraction of a group of muscle fibers (usually in a taut band) in response to snapping palpation (quick compression across the muscle fibers perpendicularly of the MTrP) (Figure 43-11).[184,193] The occurrence of the LTR also depends on the irritability of the MTrP and the pressure applied for eliciting LTR. High pressure is required to elicit an LTR in an MTrP with low irritability, and vice versa. A needle tip can provide high pressure stimulation to the MTrP and can elicit LTR much easier than using finger palpation.[97,179]

### *Motor Dysfunction*

The clinically observed reduced muscle strength (weakness) caused by an MTrP is neither a true neurogenic nor a myogenic weakness. It is a pain-induced weakness and usually occurs only in severe cases of myofascial pain. Disuse muscle atrophy occurs rarely, mainly in cases of MPS

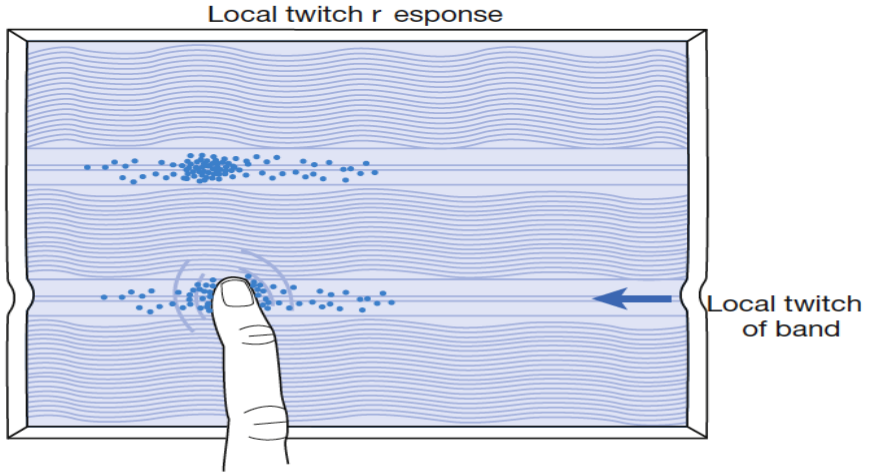
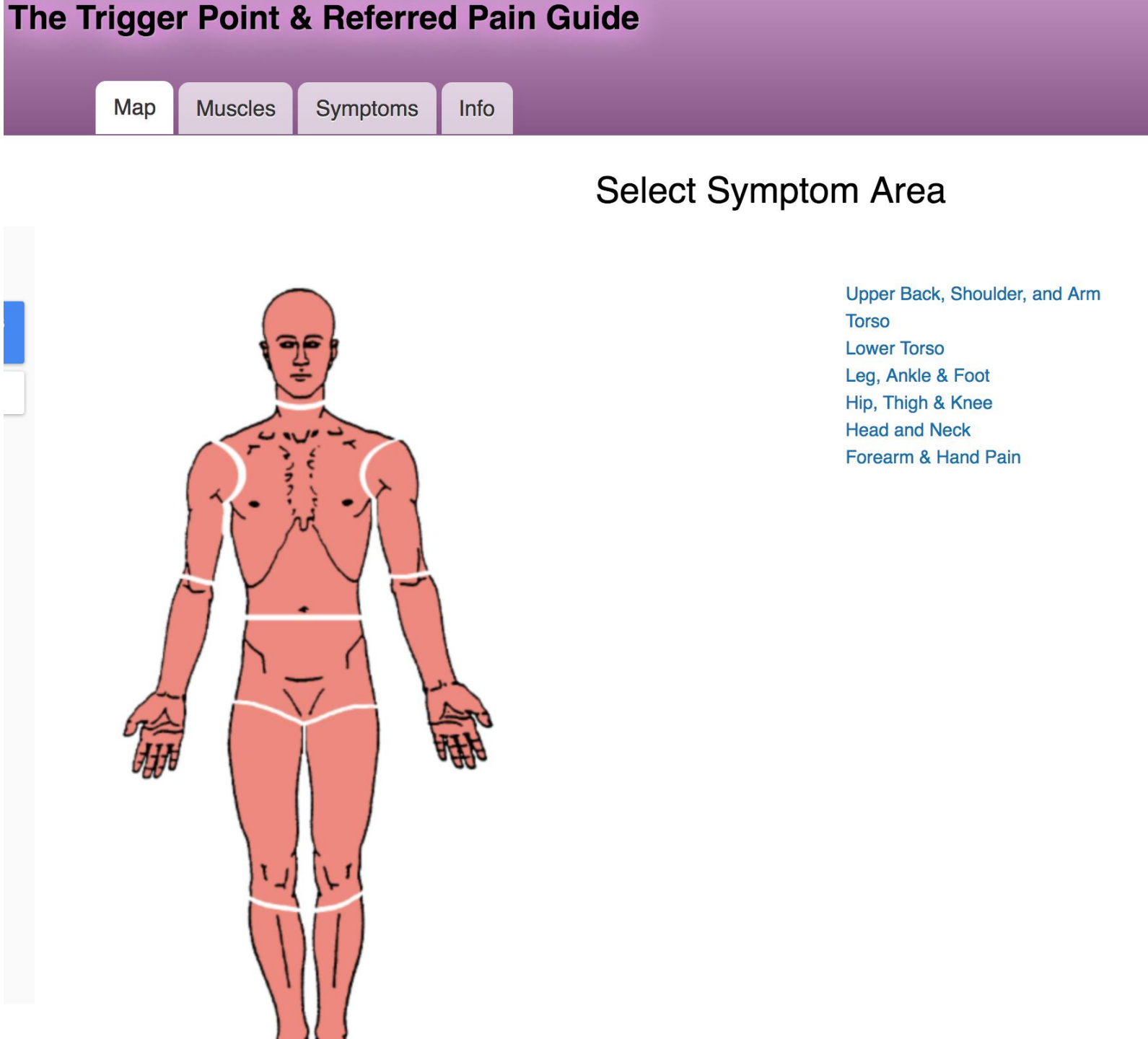



**FIGURE 43-11 Local twitch response elicited by snapping palpation.** (Modified from Simons DG, Travell JG, Simons LS: Apropros of all muscles. In *Travell & Simons' myofascial pain and dysfunction: the trigger point manual,* vol 1, ed 2, Baltimore, 1999, Williams & Wilkins, with permission.)

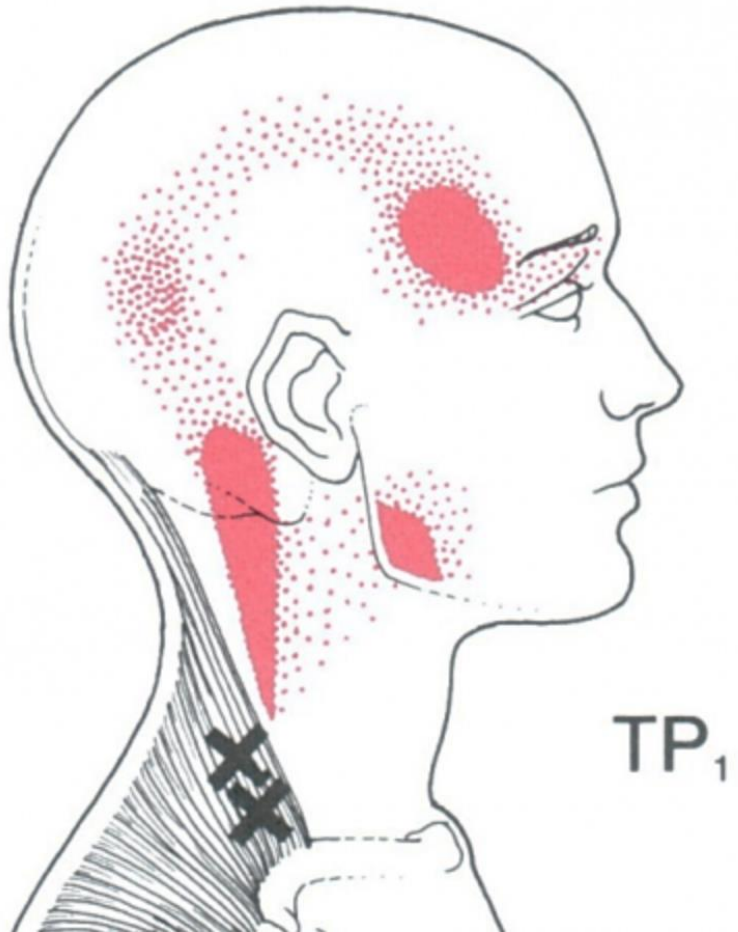
# Myofascial Trigger points

www.triggerpoints.net

http://triggerpoints.net



# Trapezius Trigger Point Diagram




**Symptom Area:**
Head and Neck

**Primary Symptoms**

Back of Head Pain
Back of Neck Pain
Cheek Pain (like Sinusitis)
Headaches or Migraines
Mid-Thoracic Back Pain
Problems Holding Arms Up (as when folding sheets)
Temple and Eyebrow Pain
Temporal Headache (Temples)
Temporomandibular Joint Disorders (TMJ)
Upper Thoracic Back Pain

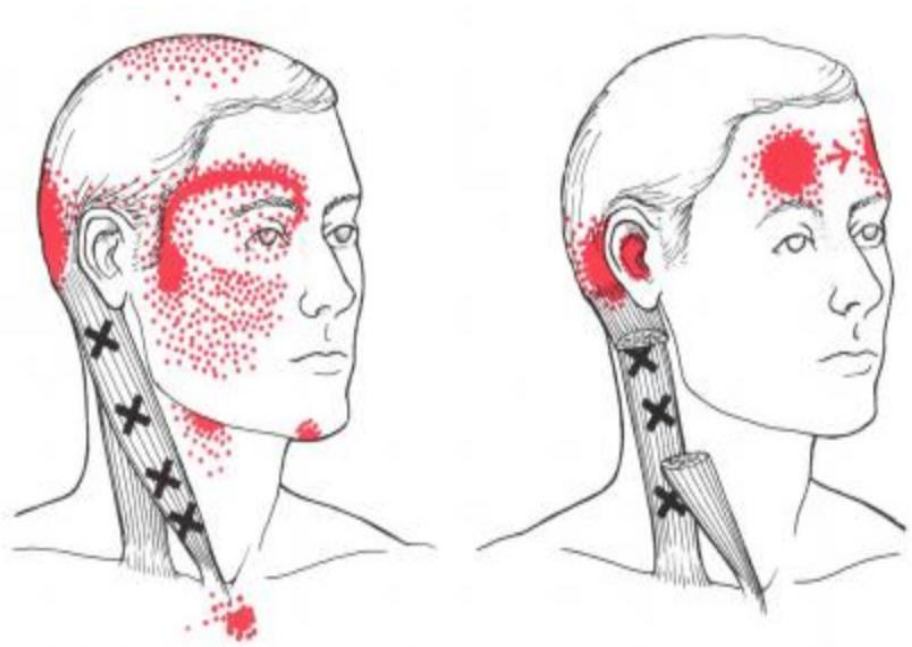
**Secondary Symptoms**

Back of Shoulder Pain

Trapezius (Wikipedia)

The X's represent the Trigger Points. There is no difference between the black and white

# Sternocleidomastoid Trigger Point Diagram



Sternocleidomastoid is commonly abbreviated to "SCM".

**Symptom Area:**

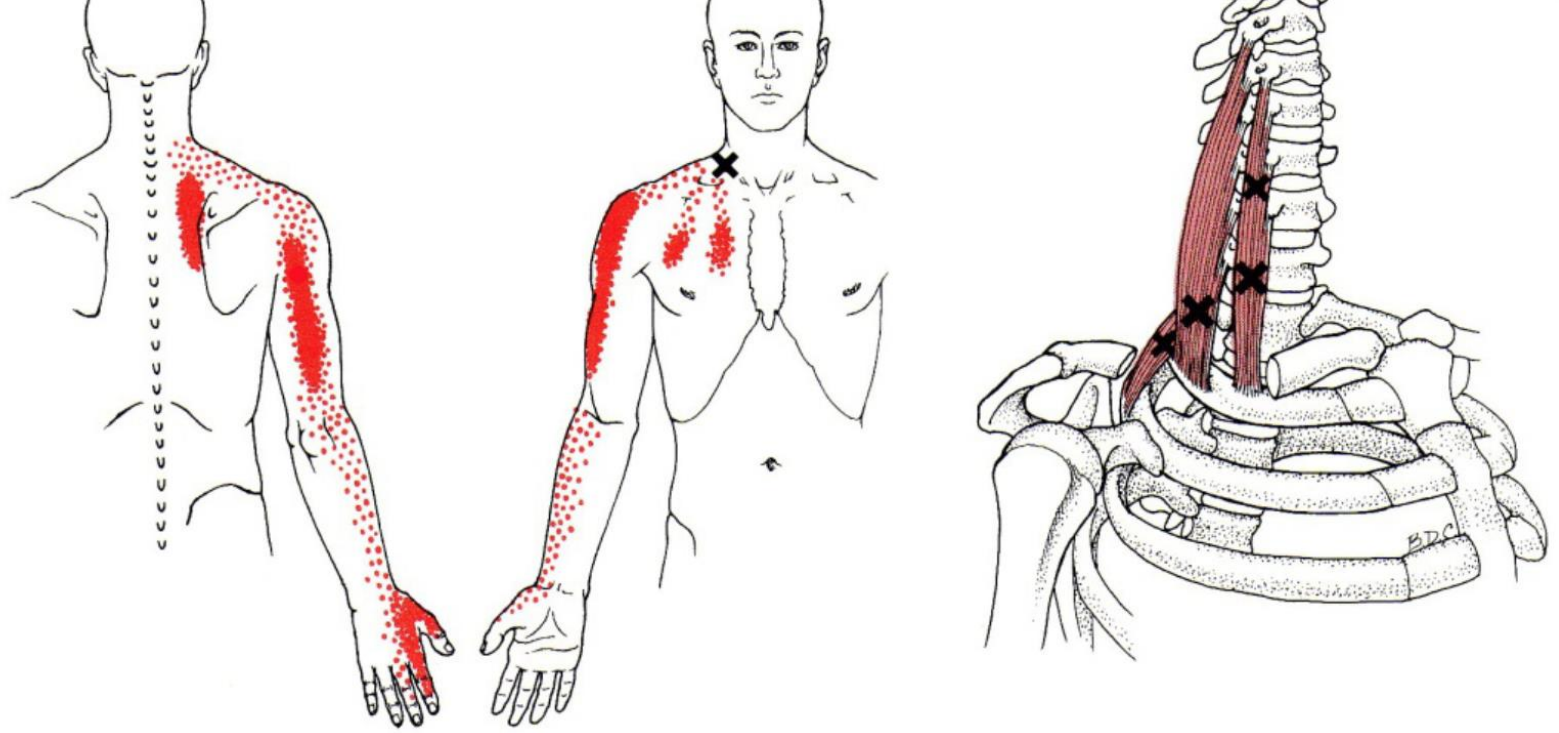
Head and Neck

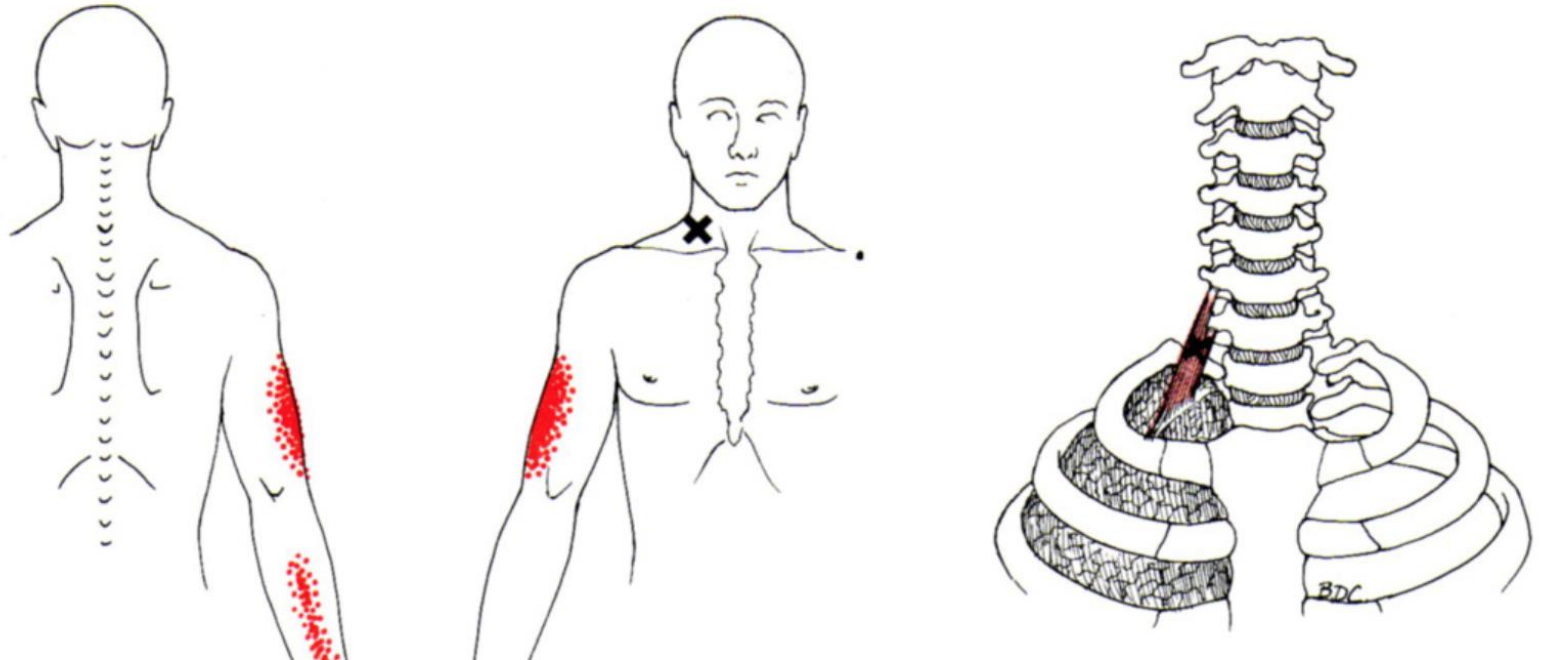
**Primary Symptoms**

Back of Head Pain
Cheek Pain (like Sinusitis)
Dizziness When Turning Head or Changing Field of View
Double/Blurry/Jumpy Print Vision
Dry Cough
Ear Pain
Earaches/Tinnitus (Ringing)/Itch

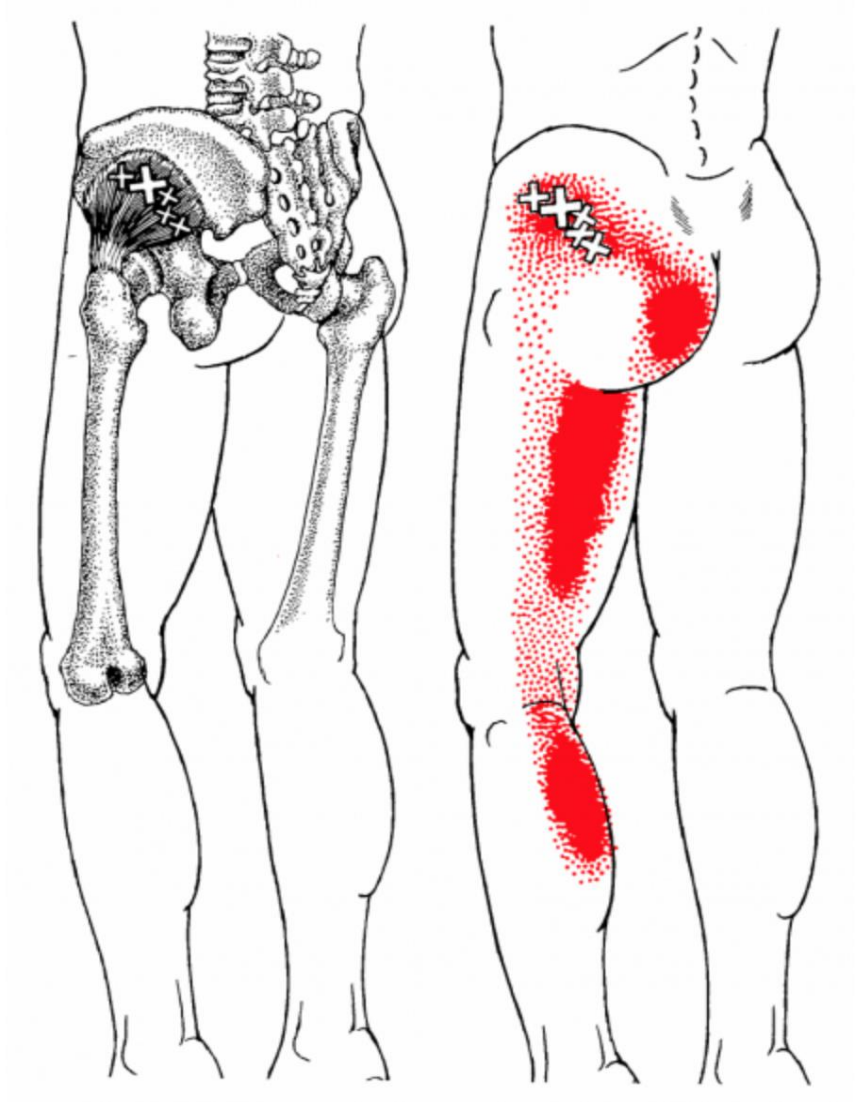
# Scalen TP

- **Symptom Area:**
- Upper Back, Shoulder, and Arm
- **Primary Symptoms**
- Back of Arm Pain
- Dorsal Finger Pain
- Front of Arm Pain
- Front of Chest Pain
- Front of Shoulder Pain
- Mid-Thoracic Back Pain
- Painful Weak Grip
- Thumb & Radial Hand Pain
- Upper Thoracic Back Pain
-



# Gluteus Minimus Trigger Point Diagram



**Symptom Area:**
Hip, Thigh & Knee

**Primary Symptoms**

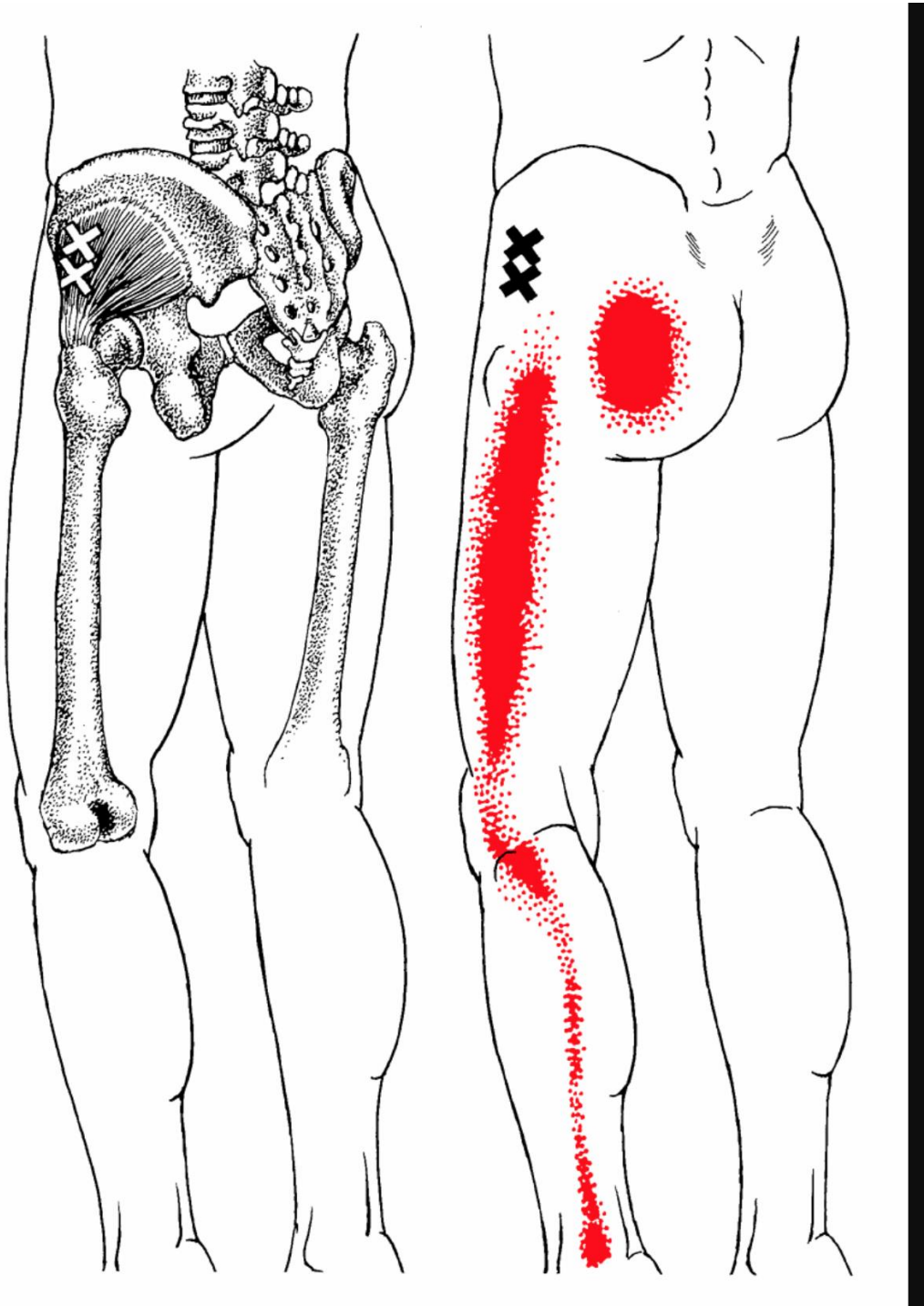
Buttock Pain
Lateral Thigh & Hip Pain
Posterior Leg (Calf) Pain
Posterior Thigh Pain
Sciatica

**Secondary Symptoms**

Lateral Leg Pain

Gluteus Minimus (Wikipedia)

The X's represent the Trigger Points.
X's. The red shaded area is the referr
red means more people experienced



# CRPS

- Budapest's Criteria



**Box 1 | Current International Association for the Study of Pain clinical diagnostic criteria for complex regional pain syndrome[1]**

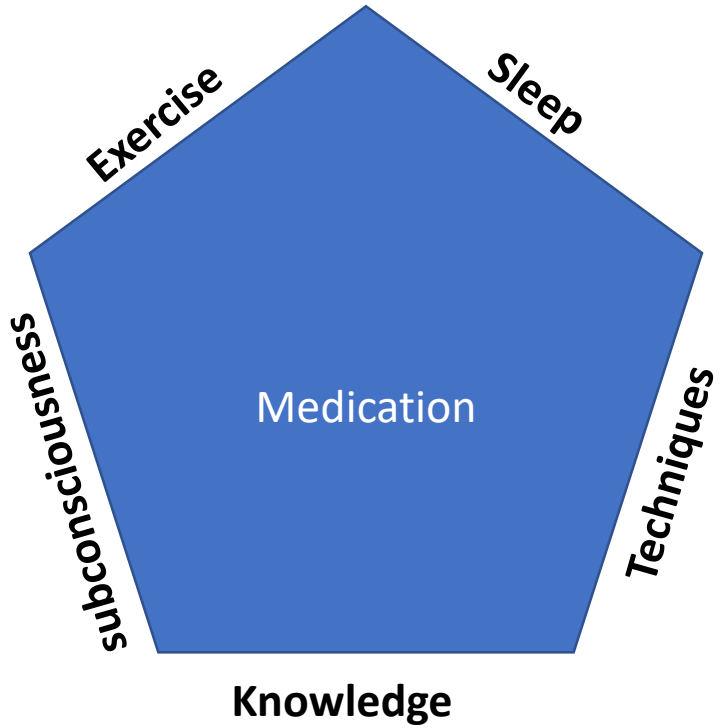
- Continuing pain, which is disproportionate to any inciting event
- Must report at least one symptom in three of the four following categories*:
  - Sensory: Reports of hyperalgesia and/or allodynia
  - Vasomotor: Reports of temperature asymmetry and/or skin color changes and/or skin color asymmetry
  - 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, nails, skin)
- 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 or deep somatic pressure, 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, nails, skin)
- There is no other diagnosis that better explains the signs and symptoms

*For research settings in which it is desirable to maximize specificity, a more stringent research diagnostic decision rule requires all four of the symptom categories and at least two of the sign categories to be positive for diagnostic criteria to be met.

# Multidiciplinary Approach

- Psychology (Mindfulness Pain Mgn, CBT, ACT, DBT,…)
- Physical therapy ( physiotherapist, Kinesiologist, occupational therapist, massage therapist, chiropractor, …)
- Nutritionist
- 3M or 3P: Medication, Mind, Movement
- Crown Module: knowledge, technique, subconscious, sleep, exercise)

# Crown Model


Exercise
Sleep
subconsciousness
Medication
Techniques
Knowledge

# Medications

- NSAIDS
- Acetaminophen
- **Gabapentinoids**
- SSRI
- SNRI
- TCA
- Opioids
- Canabinoid
- Topical / compounding

**Table 42-6** Classification of Pain Treatment Centers

| | Multidisciplinary Pain Center | Multidisciplinary Pain Clinic | Pain Clinic | Modality-Oriented Clinic |
|---|---|---|---|---|
| Comprehensive assessment and management | Yes | Yes | Yes | No |
| Physicians | Multispecialty | Multispecialty | Single specialty | Single specialty |
| Psychologists | Yes | Yes | Variable | No |
| Other health care professionals | Physical, occupational, recreation therapists; nurses; biofeedback, relaxation specialists; movement-based therapy practitioners; vocational counselors; other specialists | Physical, occupational, recreation therapists; nurses; biofeedback, relaxation specialists; movement-based therapy practitioners; vocational counselors; other specialists | Variable | No |
| Therapeutic modalities | Multiple | Multiple | Variable | Focused |
| Affiliation | Major health science institutions | Variable | Variable | Variable |
| Research and educational activity | Yes | Variable, not typical | Variable, not typical | Variable, not typical |
| General or specific focus of care | Comprehensive, acute and chronic pain | Comprehensive, chronic pain | Specific, chronic pain (i.e., regional focus such as headaches) | Specific, acute and chronic pain (i.e., nerve block clinics) |

# Nonpharmacologic

- Nonpharmacologic treatments of CNCP are even more important in the elderly than in the general adult population

## Anger

Ongoing failure to achieve pain relief and repeated unsuccessful attempts to escape pain have been shown to be associated with increased levels of anger and physiologic responses to pain, independent of pain intensity. In a study of patients presenting for chronic pain management, Okifuji et al. reported 70% of participants with angry feelings, most commonly with themselves (74%) and health care professionals (62%). In this study, anger toward oneself was associated with pain and depression, whereas “only anger” was related to perceived disability.

Braddom, PhysMedRehab textbook, Edition, Chapter 42: Chronic Pain, Page 944

# Anxiety

In chronic pain, it has been found to be a significant predictor
of pain severity, disability, and pain behaviors
Anxiety related to pain is an important factor involved in maladaptive responses, behavioral interference, and affective distress.

# Cognitive Factors

Many patients with chronic pain demonstrate a reduction in goal-directed activities and assume a more passive sedentary lifestyle. This further contributes to a downward spiral of inactivity, deconditioning, and increased somatic focus. Patients who frequently have excessively negative thoughts about themselves, others, and the future are more likely to experience high levels of depression, low levels of activity, and increased tension. Pain beliefs (pain-related fear and self-efficacy), anger, and passive coping are important affective factors, which can significantly affect pain response, behavior, and function.

The traditional biomedical model fails because it focuses on the identification and treatment of a specific anatomic pain generator without accounting for the psychologic determinants involved in the pain experience. The treatment goals of chronic pain management encompass the acceptance and reduction of pain, maximal restoration of functional mobility, restoration of sleep, improvement in mood, return to leisure activity, and return to work

# Depression

A strong association between chronic pain and depression has been suggested

Somatic symptoms of major depressive disorder can also be common in patients with chronic pain (i.e., change in appetite, change in weight, loss of energy, and sleep disturbance).

The incidence of depression among chronic pain patients can be higher than with other chronic medical conditions.

In general, most systematic reviews on the relationship between pain and depression suggest that chronic pain precedes depression

Braddom, PhysMedRehab textbook, Edition, Chapter 42: Chronic Pain, Page 944

**COX inhibitors:** inhibit peripheral and central hyperalgesia (dorsal horn) reduces (normalizes) excitability of the 2nd neuron for glutamate-mediated transmission

Gabapentinoids, amantadine, infusion of ketamine have been quite effective in many patients. **N-methyl-D-aspartate (NMDA) receptor antagonists**, by blocking sensitization of neurons in the spinal cord (especially for managing patients, experiencing wind-up phenomenon)

**Pregabalin** increases stage 3, 4 sleep, while **Benzodiazepine** reduces stage 1, 3, 4 sleep. Pregabalin reduced the number of awakenings but did not increase sleep time.

Gabapentin: decrease firing rate of neurons, serotonin liberation, up-regulation of 5HT2 receptor, Decreases in cellular excitability

# Antidepressants can induce neurogenesis in the adult brain (although the mechanisms involved are not clearly understood)

- Antidepressant targets dysregulated systems in depressed or anxious states, including:

1- Hypothalamic–Pituitary–Adrenal (HPA) axis,

2- Monoaminergic system,

3- γ-aminobutyric acid (GABA) system,

4- Adult hippocampal neurogenesis.

# Mu Opioid receptors (MOR)

- Exist mostly presynatically in periaqueductal grey region “PAG” (primary control center for descending pain modulation, enkephaline-producing cells, project to Raphe nuclei where Serotonin releases and descends to dorsal horn, sunstantia gelatinosa: C fibers and A fibers)
- .The first time opioids are taken, patients frequently report acute side effects such as sedation, dizziness, nausea, and vomiting
- Cognitive impairment, Respiratory depression, muscle rigidity particularly in the trunk, abdomen, and larynx.
- Reduce gastrointestinal motility, increase circular contractions, decrease gastrointestinal mucus secretion, and increase fluid absorption (Combination with Naloxone)

# Equianalgesic doses of different routes of administrations of opioids

| Drug | Dose (mg) | Conversion Factor |
|---|---|---|
| Morphine, oral | 30 | 1 |
| Buprenorphine, s.l. | 0.3 | 100 |
| Tramadol, oral | 150 | 0.2 |
| Methadone, oral | 100 | 0.3 |
| Morphine, i.v., i.m., s.c. | 10 | 3 |
| Hydromorphone, oral | 6 | 5 |
| Oxycodone, oral | 20 | 1.5 |

# Opioid side effects

- **Gastrointestinal issues**
- **Sleep-related breathing problems** (92% of patients on > 200 MME/day experienced irregular breathing, compared to 61% of <200 mg and 5% of people not taking opioids)
- **Cardiovascular issues** (increased risk of MI & HF especially if taking>180 d)
- Opioid-induced hyperalgesia (patient becomes increasingly sensitive to pain, it can also cause extreme acute pain after surgery)
- **Increased risk of fractures** (affect the CNS, causing dizziness and reduced alertness, result in falls, >50 MME/d double the risk of fx)
- **Hormone problems (**men: decrease in the production of testosterone: erectile dysfunction, reduced libido, fatigue and even hot flashes. W: decrease estrogen, FSH, and increased prolactin lead to osteoporosis, galactorrhea, oligomenorrhea
- **Depression (**38% of people on long-term opioids)

# Cognitive-Behavior Therapy

In CBT, patients are taught to identify the impact of thoughts on emotions, and to modify thoughts to achieve relief from emotional distress. Introduced by Ellis and developed by Beck and others. CBT is based on well-replicated research showing that the emotions of individuals are driven more by how they perceive the event than by the event itself. It is also based on the recognition that persons who are depressed, anxious, angry, or hopeless often distort their thinking in ways that create or intensify the emotional upset. With this intervention, patients learn to identify exaggerated or frankly erroneous notions and to replace them with thoughts that are both more realistic and less upsetting.

**Rehabilitation psychologists** play a critical role in the care of persons with chronic pain by identifying and treating the multiple psychological factors that determine the level of pain-related disability.

Rehabilitation psychologists, aware of social learning theory as it relates to chronic pain can help the patient, family, and treatment team recognize how unintended reinforcement of pain behaviors can thwart efforts to reduce patients' pain behaviors.

Braddom, PhysMedRehab textbook, 4th Edition, Chapter 1, Page 86

**Myofascial release Technique (ART)** is frequently used to treat chronic pain and restore normal range of motion. This technique is founded on the premise
that the body is encased in connective tissue (i.e., fascia).
Fascia is the ground substance that interconnects all bones, muscles, nerves, and other internal organs and tissue. Because of the interconnections, injury
in one area of t

Braddom, PhysMedRehab textbook, 4th Edition, Chapter 19, Page 443

## Massage Therapy

There are recommendations suggesting that massage therapy might be useful as an adjunct treatment or possible alternative treatment.

## Aquatherapy

## Exercise Therapy

Multiple high-quality studies have found, however, that exercise results in positive outcomes in the treatment of CP. It appears that the most effective exercise includes an individualized regimen learned and performed under supervision that includes stretching and strengthening.87 This is not surprising because it is generally believed that the purpose of exercises is to strengthen and increase endurance of muscles and improve flexibility in areas where this is lacking. This is combined with motor retraining to establish normal patterns of muscle activity, and treatment of deficits of the kinetic chain that interfere with biomechanical efficiency.

**Multidisciplinary Pain Treatment Program**. Strong evidence exists that a multidisciplinary program with a goal of functional restoration is helpful for severe chronic pain.

# Pilates

- The Pilates method was developed by Joseph Pilates in the early 1920s as a training process that uses specially designed resistance training equipment to perform ordered exercise sequences that focus on core strengthening, power, concentration, breathing, and kinesthetic awareness. Although the method has traditionally been practiced by ballet dancers, it has now progressed to the mainstream world of fitness. A scant body of literature supports its role in the treatment of chronic pain syndromes, and its use is experiential. Improvements in strength and flexibility, as well as static and dynamic posture in selected populations, have been reported
- Ives JC, Sosnoff J: Beyond the mind–body exercise hype, Phys Sports

Med 28:67-81, 2000.

| Neuro-transmitter: | ACh<br>Acetylcholine | NE<br>Norepinephrine | DA<br>Dopamine | 5-HT<br>Serotonin | Glu<br>Glutamate | GABA | Opioids | Cannabinoids | Histamine |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| Effects: | ↓Heart rate<br>↑Secretions (sweat, saliva)<br>↑Memory<br>↑Muscle contractions | ↑Heart rate<br>↑Alertness<br>↑Happiness ↓Blood circulation ↓Pain | ↑Alertness<br>↑Happiness<br>↓Hunger | ↑Happiness<br>↑Fullness ↓Pain | The most common excitatory neurotransmitter | ↑Sleepiness<br>↓Anxiety ↓Alertness<br>↓Memory ↓Muscle tension | ↑Sleepiness<br>↓Anxiety ↓Pain | ↑Hunger | ↑Wakefulness<br>↑Stomach acid<br>↑Itchiness<br>↓Hunger |
| Drugs that increase or mimic: | Nicotine, muscarine, Chantix, nerve gases (VX, Sarin), Alzheimer's drugs (Aricept, Exelon), physostigmine, Tensilon, pilocarpine | Amphetamine, cocaine, SNRIs (Effexor, Cymbalta), tricyclic antidepressants, MAOIs, Wellbutrin, LSD, pseudoephedrine (Sudafed), albuterol, pyridostigmine | Amphetamine, cocaine, Parkinson's drugs (levodopa, bromocriptine, benztropine), MAOIs, Wellbutrin, LSD | Amphetamine, cocaine, LSD, psychedelics (mushrooms, mescaline), SSRIs (Prozac, Zoloft), tricyclic antidepressants, MAOIs, BuSpar, triptans (sumatriptan, for migraines) | D-cycloserine, domoic acid (shellfish) | Alcohol, barbiturates (phenobarbital), benzodiazepines (Valium), GHB, baclofen, neurosteroids (alphaxolone), muscimol | Morphine, heroin, fentanyl, hydrocodone (Vicodin) | THC (marijuana, hashish), nabilone | Opiates, betahistine |
| Drugs that decrease or block: | BZ, atropine, scopolamine, benztropine, biperiden, curare, Botox, mecamylamine, α-bungarotoxin | Propranolol, clonidine, phentolamine, reserpine, AMPT | Antipsychotics (Haldol), reserpine, tetrabenazine, AMPT | Atypical antipsychotics (Risperdal, Seroquel), Zofran, reserpine, TPH inhibitors, tryptophan-depleted drink | PCP, ketamine, Namenda (for Alzheimer's), dextromethorphan (Robitussin), dizocilpine | Flumazenil, bicuculline, bemegride, Ro 15-4513, phaclofen | Naloxone, naltrexone | Rimonabant | Benadryl, antipsychotics, Tagamet, Zantac |
| Disclaimer: Do not use drugs for fun. Take drugs exactly as prescribed by a trustworthy doctor. This chart provides a rough overview, it is an oversimplification, it has omissions, and it may have blatant inaccuracies due to ongoing scientific debate or the writer's idiocy. | | | | | | | | | |

# Risk factors of Chronicity

Intensity of the inciting factor

Memory of Pain

Coping skills, Behaviours, Attitudes and Belief

Compensation process/problem

Employment

Legal issues

Coincidences, comorbidities

Psychiatric problems like PTSD

## Complexity in the CNCP Field

Patient issues – Expectations are often very unrealistic
Referring physician challenges – struggling with their patients
Lots of complicated pt issues: Px / Psych / Time limits / access to resources….
Patient willingness and motivation
Physician willingness and motivation
Literature is overwhelming and still has many gaps
New government legislation for drug formulation 2016
Fentanyl and high dose formulation of opioids eliminated
NPs now able to write Opioid Scripts
Opioid Crisis = High Awareness & High Anxiety
CPSO regulatory body Reviewing and Auditing Physician practices based on Opioids
Medical Education in Undergrad and Post Grad is very limited
Vets > 80 hrs
Medical Students < 10 hrs
Inherited pts started on meds in Acute care
Pain Clinics in Community often focused on procedures
Opioid Guidelines in May 2017
Lowered the watchful to 50-90MEQ Morphine