FBSS: JUST ANOTHER CHRONIC PAIN PRESENTATION?

Dr Terence C Lim
MBBS, FAFRM(RACP), FFPMANZCA
Consultant in Rehabilitation and Pain Medicine
The North Eastern Rehabilitation Centre

(Roy) Carey's Canon Number 1

"The system works best for everyone in it, if it is broken"

(except for patients, insurers and the tax payers of Australia)

Lewin et al. BMC Health Services Research (2021) 21:955
https://doi.org/10.1186/s12913-021-06900-8

BMC Health Services Research

RESEARCH Open Access

Rates, costs, return to work and reoperation following spinal surgery in a workers' compensation cohort in New South Wales, 2010–2018: a cohort study using administrative data

AM Lewin[1*], M Fearnside[2], R Kuru[3], BP Jonker[4], JM Naylor[1], M Sheridan[5] and IA Harris[1]

Abstract

Background: Internationally, elective spinal surgery rates in workers' compensation populations are high, as are reoperation rates, while return-to-work rates following spinal surgery are low. Little information is available from Australia. The aim of this study was to describe the rates, costs, return to work and reoperation following elective spinal surgery in the workers' compensation population in New South Wales (NSW), Australia.

Methods: This retrospective cohort study used administrative data from the State Insurance Regulatory Authority, the government organisation responsible for regulating and administering workers' compensation insurance in NSW. These data cover all workers' compensation-insured workers in New South Wales (over 3 million workers/year). We identified a cohort of insured workers who underwent elective spinal surgery (fusion or decompression) between January 1, 2010 and December 31, 2018. People who underwent surgery for spinal fracture or dislocation, or who had sustained a traumatic brain injury were excluded. The main outcome measures were annual spinal surgery rates, cost of the surgical episode, cumulative costs (surgical, hospital, medical and physical therapy) to 2 years post-surgery, and reoperation and return-to-work rates 2 years post-surgery.

Results: There were 9343 eligible claims (39.1 % fusion; 59.9 % decompression); claimants were predominantly male (75 %) with a mean age of 43 (range 18 to 75) years. Spinal surgery rates ranged from 15 to 29 surgeries per 100,000 workers per year, fell from 2011-12 to 2014-15 and rose thereafter. The average cost in Australian dollars for a surgical episode was $46,000 for a spinal fusion and $20,000 for a decompression. Two years post-fusion, only 19 % of people had returned to work at full capacity; 39 % after decompression. Nineteen percent of patients underwent additional spinal surgery within 2 years of the index surgery, to a maximum of 5 additional surgeries.

* Correspondence: adriane.lewin@unsw.edu.au
[1]South Western Sydney Clinical School, UNSW; Whitlam Orthopaedic Research Centre, Ingham Institute for Applied Medical Research, NSW, Liverpool, Australia
Full list of author information is available at the end of the article

ANZ Journal of Surgery

Royal Australasian College of Surgeons

ORTHOPAEDIC SURGERY

Lumbar spinal fusion surgery outcomes in a cohort of injured workers in the Victorian workers' compensation system

Janine S. McMillan PhD ✉, Kyle Jones BA, BSc(Hons), Leonard Forgan PhD, Ljoudmila Busija PhD, Roy P. L. Carey MBBS(Hons) FRACS(Orth), Andrea M. de Silva PhD, Mark G. Phillips BPhysio; Grad Dip Erg

First published: 25 November 2021 | https://doi.org/10.1111/ans.17391 | Citations: 1

J. S. McMillan PhD; **K. Jones** BA, BSc(Hons); **L. Forgan** PhD; **L. Busija** PhD; **R. P. L. Carey** MBBS(Hons) FRACS(Orth); **A. M. de Silva** PhD; **M. G. Phillips** BPhysio; Grad Dip Erg.

The corresponding author, Janine McMillan, is not a recipient of a research scholarship.

The paper is not based on a previous communication to a society or meeting but has been presented as an oral presentation at the Actuaries Institute 2021 Injury and Disability Schemes Seminar in October 2021

Background

Lumbar spinal fusion (LSF) outcomes for workers' compensation patients are worse than for the general population. The objectives were to examine the long-term work capacity, opioid prescription and mental health outcomes of injured workers who have undergone LSF surgery in Victoria, Australia, and to identify demographic and pre- and post-operative characteristics associated with these outcomes.

Methods

Retrospective study of 874 injured workers receiving elective LSF from 2008 to 2016 in the Victorian workers' compensation system. WorkSafe Victoria's claims data were used to infer outcomes for recovery. Association of demographics, pre-surgery and surgery variables with outcomes were modelled using multivariate multinomial logistic regression analyses.

Results

Twenty-four months after LSF surgery, 282 (32.3%) of the 874 injured workers had substantial work capacity, 388 (44.4%) were prescribed opioids, and 330 (37.8%) were receiving mental health treatment.

Opioid prescription and limited work capacity before surgery were independent strong predictors of opioid prescription, reduced work capacity and mental health treatment 24 months after LSF. Pre-operative mental health treatment was associated with the use of mental health treatment at 24 months. Other predictors for poor outcomes included a greater than 12-month duration from injury to surgery, LSF re-operation and common law or impairment benefit lodgement before surgery.

Conclusion

An association between pre-operative factors and post-operative outcomes after LSF in a Victorian workers' compensation population was identified, suggesting that pre-operative status may influence outcomes and should be considered in LSF decisions. The high opioid use indicates that opioid management before and after surgery needs urgent review.

Likelihood of RTW after various times off work

Journal of Occupational Rehabilitation, Vol 4, No 2, 1994

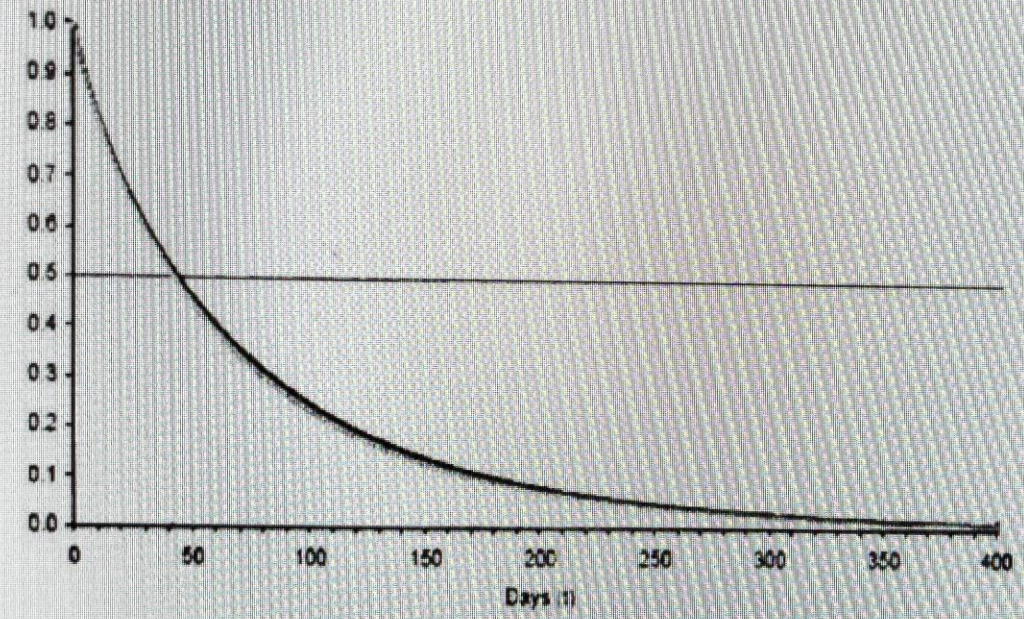


Figure 1 shows how the number of days spent away from work impacts on a person's chance of return. In many systems, the likelihood of return to work is down to 50% after 45 days off work.

What do I do?

- Things to consider
- Interventions
  - Pain Rehabilitation

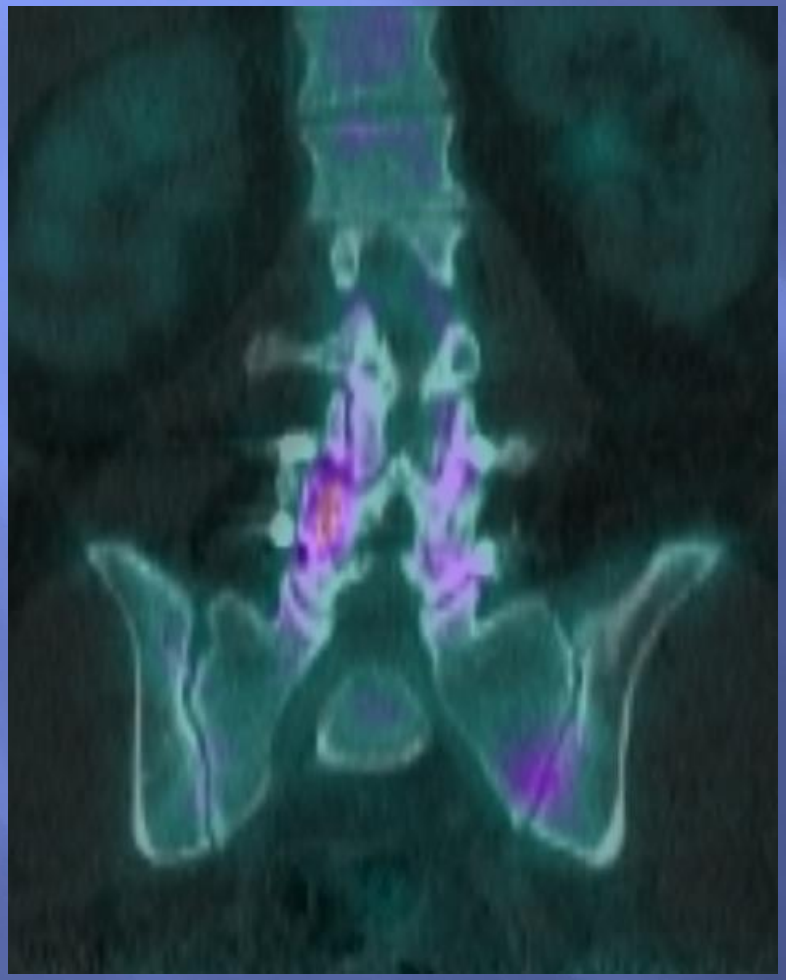
Things to Consider:

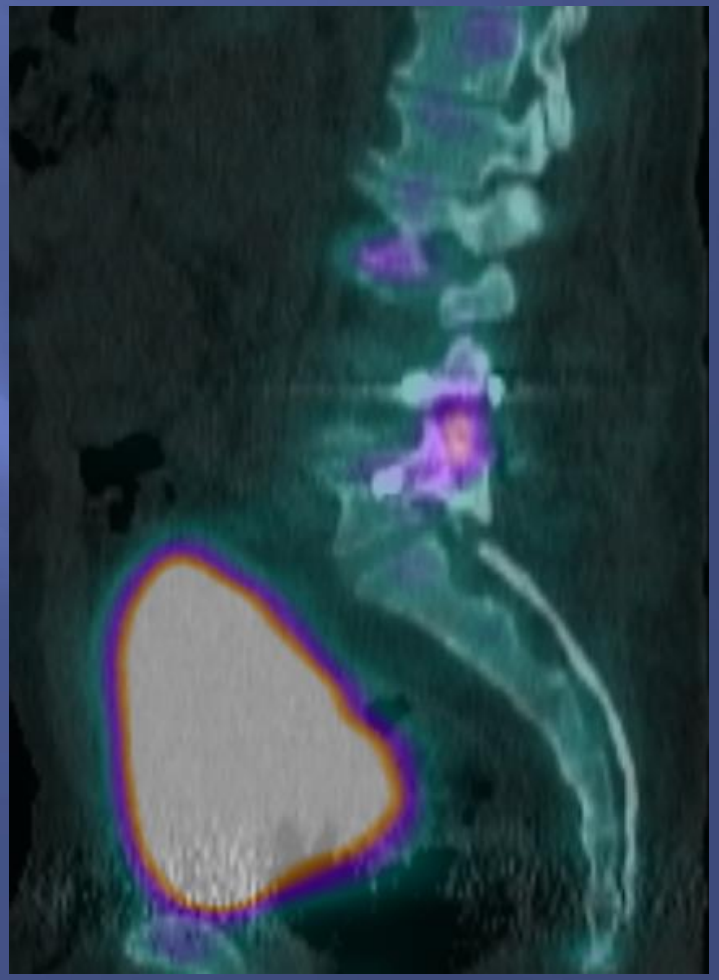
- ?Ongoing Nociception
- ? Patient expectations
- Psychology/Traumatic (developmental) history
- Central sensitisation

1. Assumption

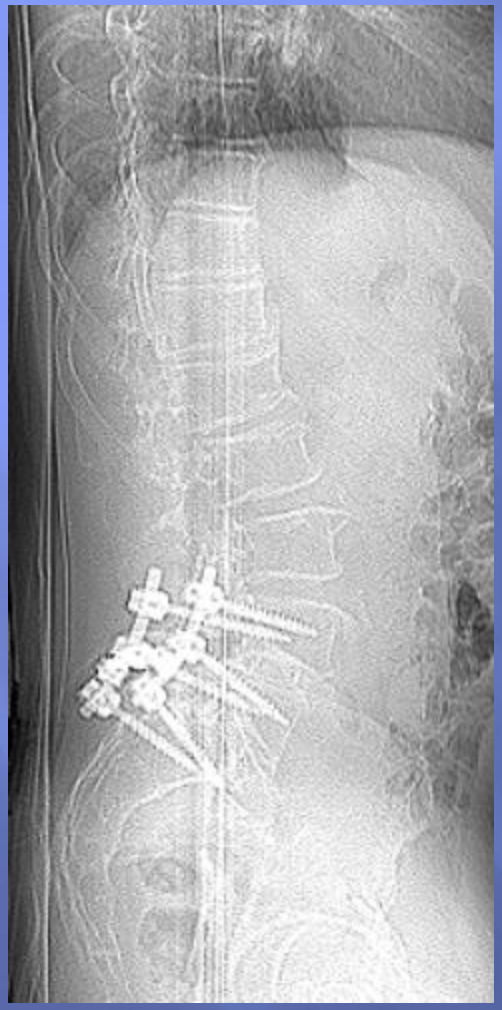
Following spine surgery, the referring surgeon has further investigated/treated any additional spinal nociception

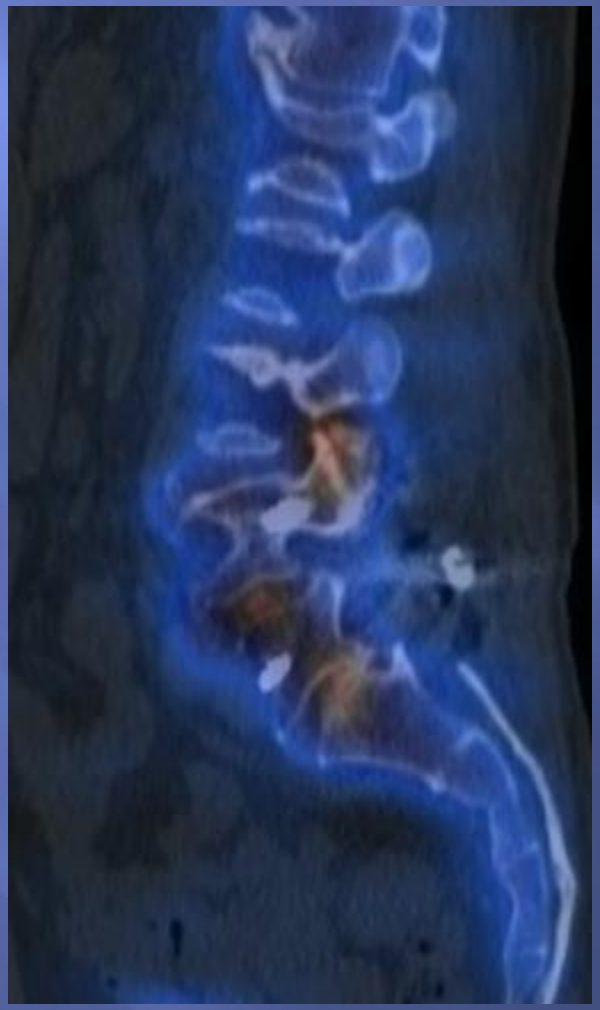
At Level

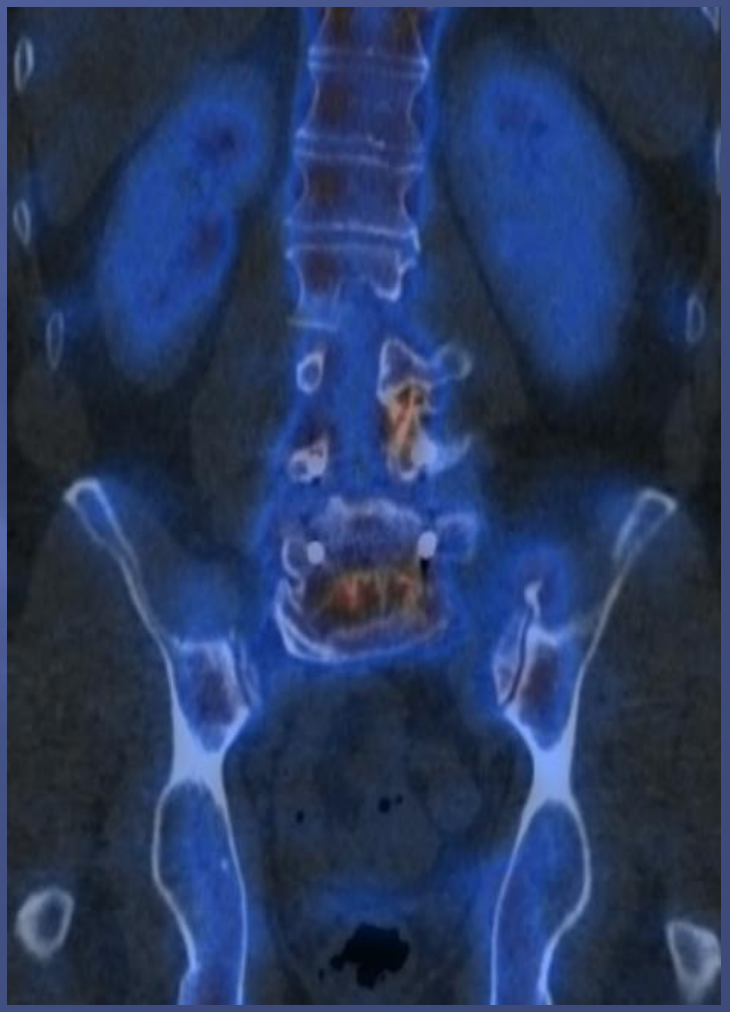




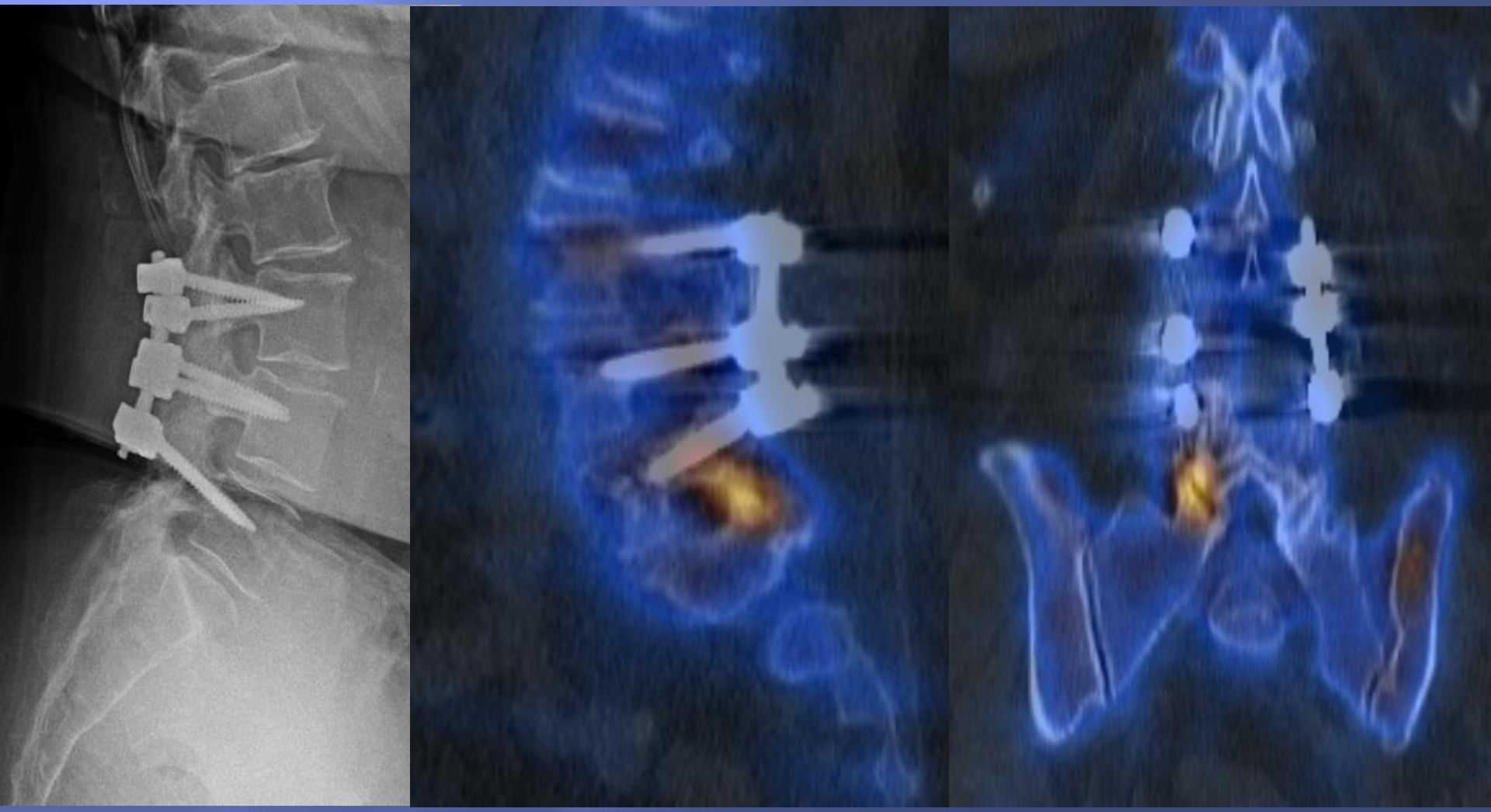
Adjacent Segment



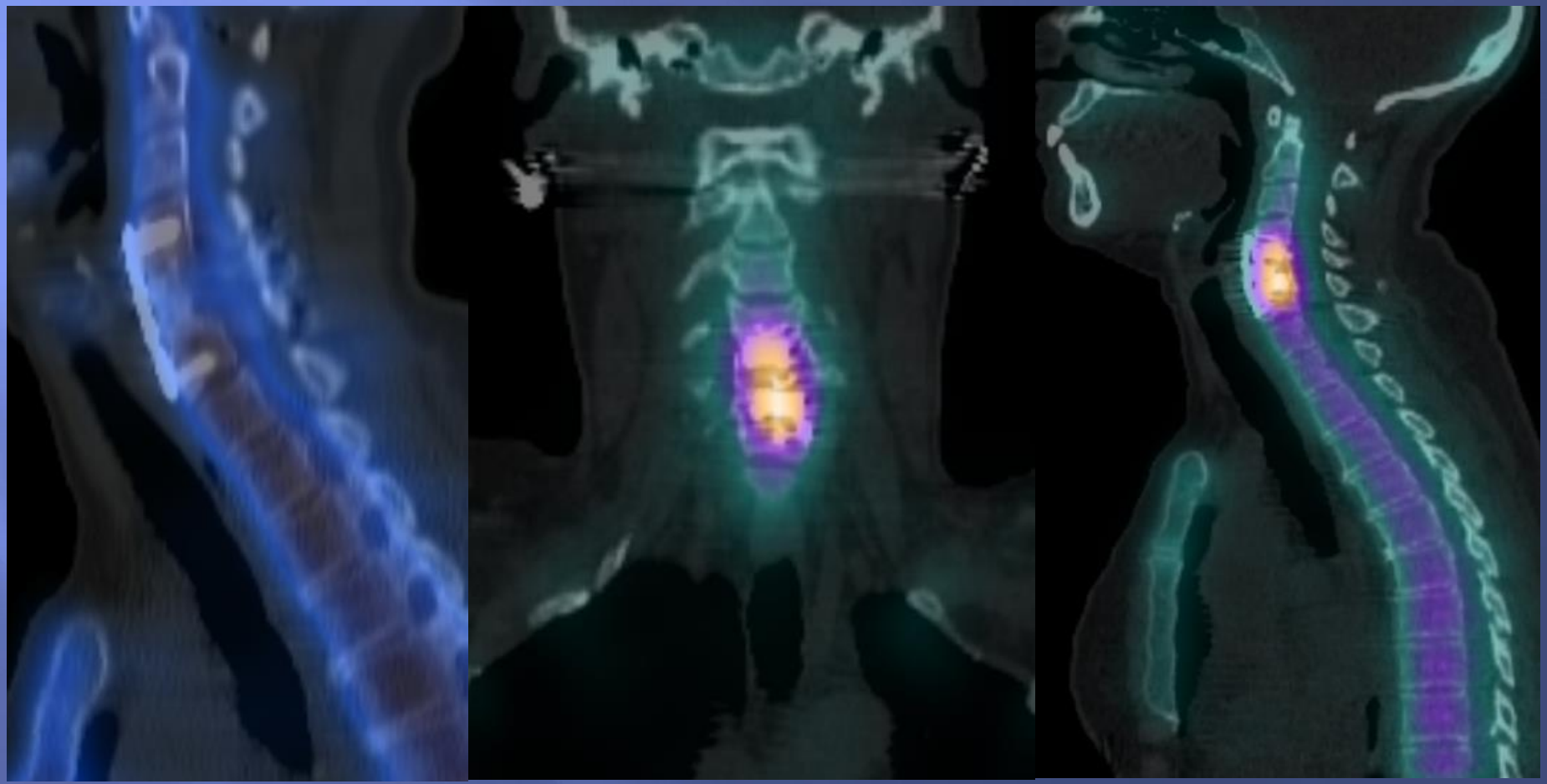


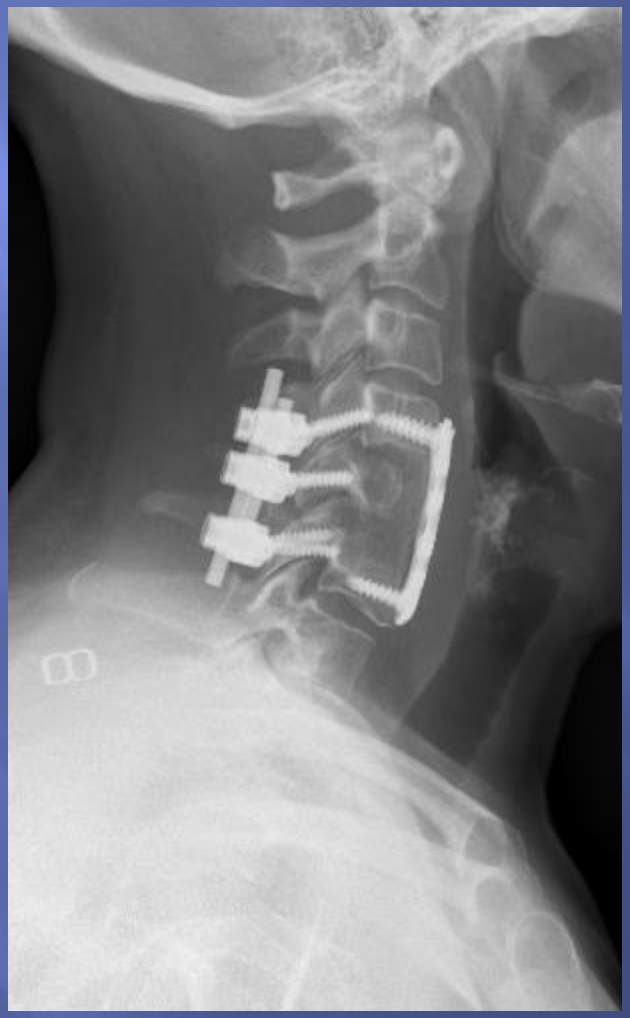


Inferior Adjacent Segment



Non-union





2. Patient Expectations

- Pain cure
- “Spinal decompression will fix my back pain”

3. Pschological/Behavioural Aspects = Poor Adaptability

Olympia Private Rehabilitation Hospital Chronic Pain Survey

Dr James Olver 2006

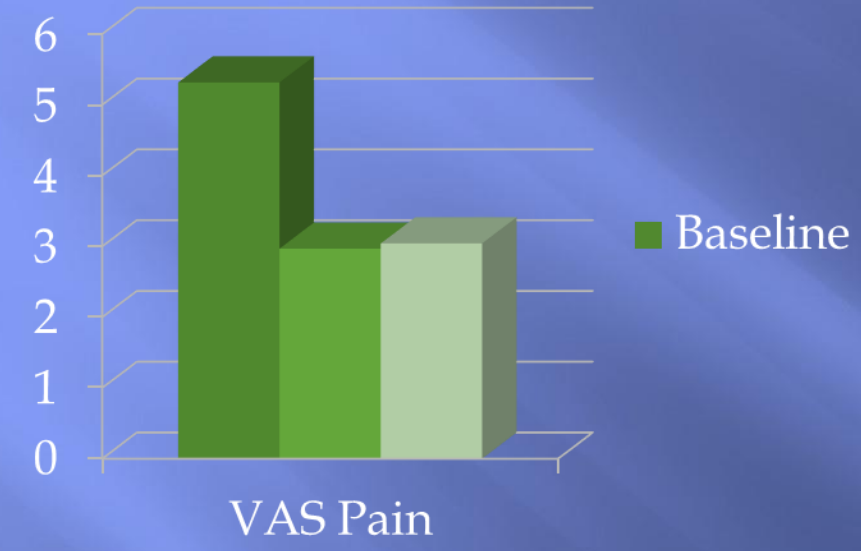
Pain Measures:

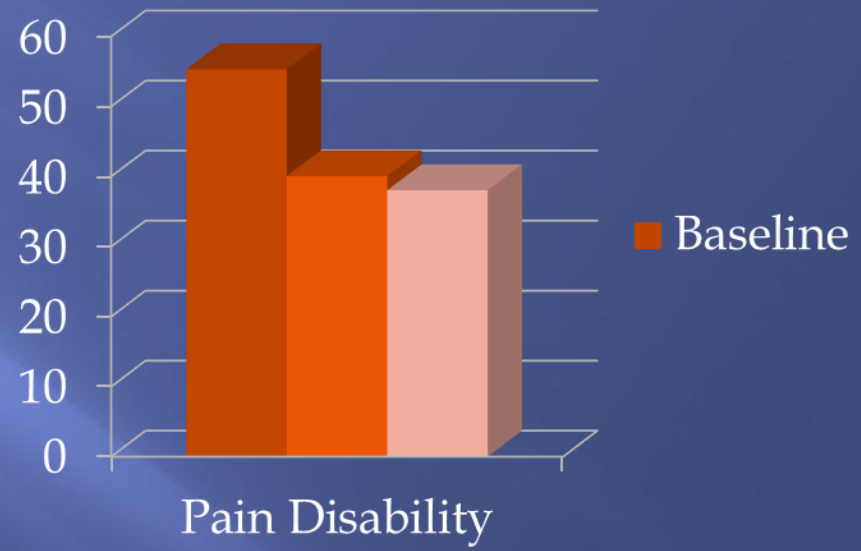
- Visual analogue scale (VAS)
- Pain Disability Index (PDI)
- (Oswestry) Back Disability Index
- Neck Pain Disability Index (NDI)

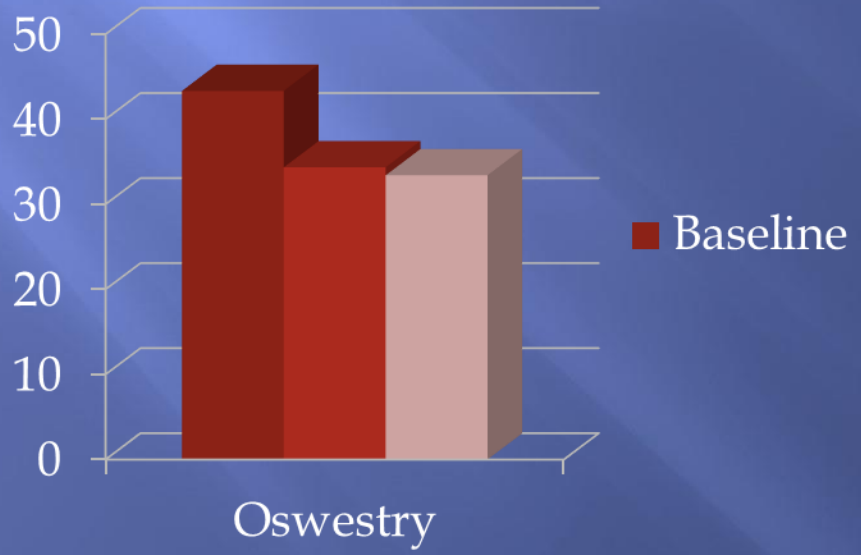
Psychiatric Measures:

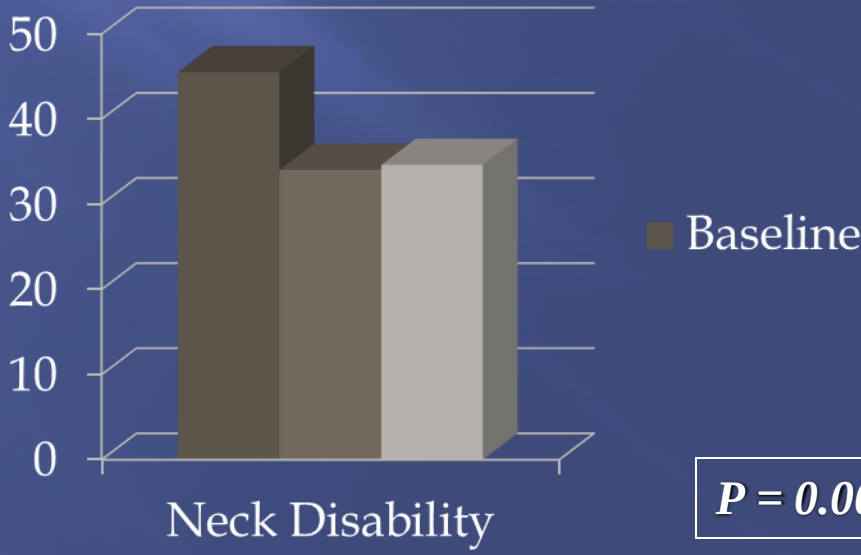
- Hospital Anxiety Depression Scale (HADS)
- Hysteroid /Obsessoid Questionnaire (HOQS)

Physical Scales



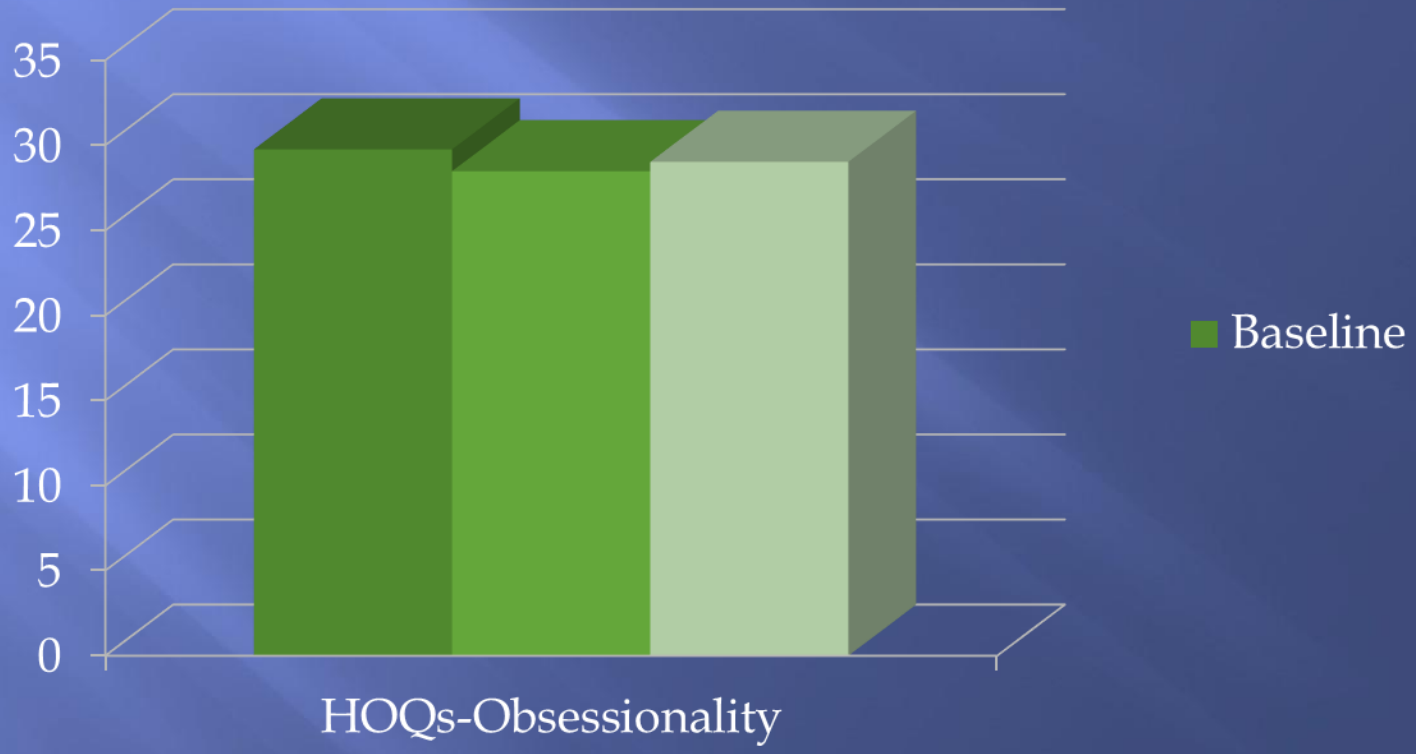






P = 0.000

HOQs - *Obsessionality*



Trauma-related Developmental History = Poor Adaptability

- Major interference with coping
  - Resilience
- Abuse – Obvious
- Chronic low grade = Role Model
  - trying to meet the expectations of others
- Chronic overdoers – activity "above threshold"
  - More is better!
  - Mx of anxiety
- Masquerade as Personality Disorder

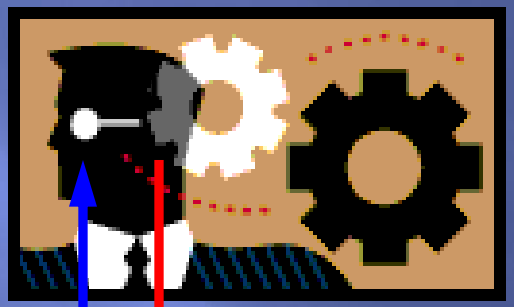
Personality Disorder = Poor Adaptability

- 12.2 across 10 Western Countries
- 45.5% of “Psychiatric” patients
- 24% - 66% of chronic pain patients

GATE Theory

- Melzack & Wall 1962
- Fast fibres travel to the spinal cord and block the slow fibres
- Other areas of the brain and sensations from other body parts have an effect on this system as well

Pain Neurophysiology



Ascending input

Descending modulation

Primary afferent nerve

Trauma

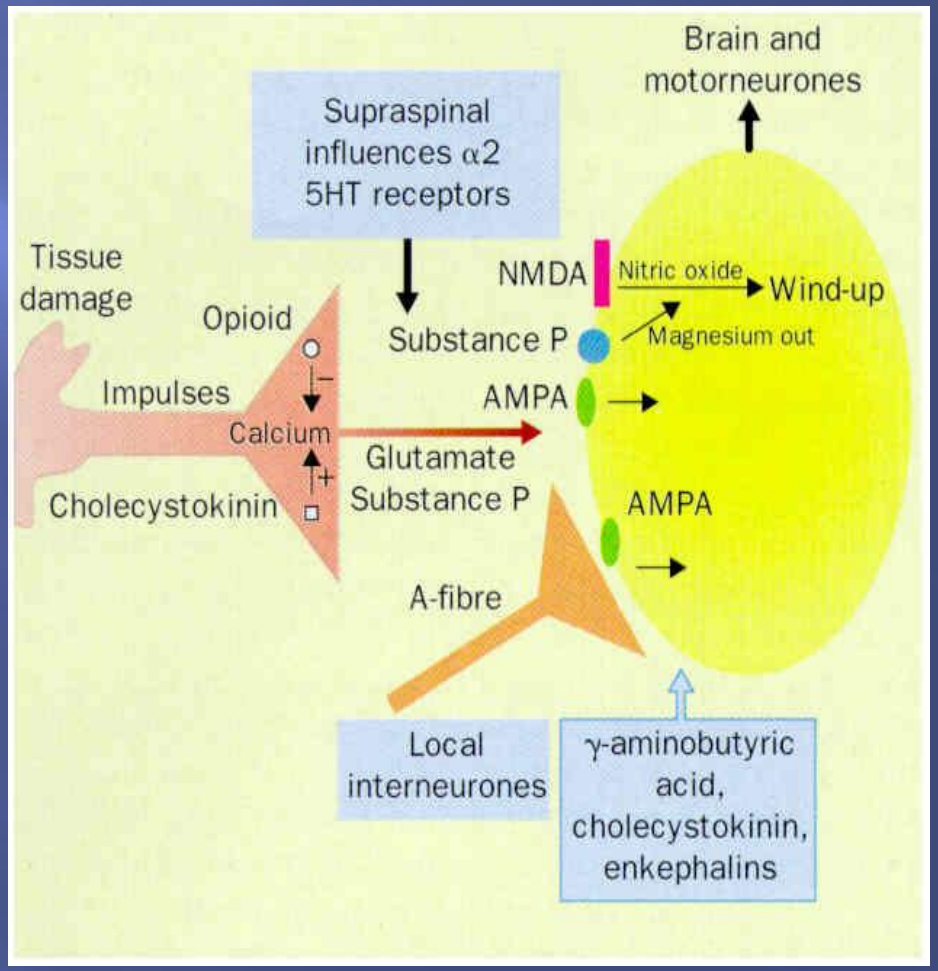
1. Tortora, G., Brabowski, S.R. *Principles of Anatomy and Physiology*, 10th Ed (2003)

Central Sensitisation

- Central Nervous System Pain Pathway Sensitisation

- Neurophysiological changes in central nervous system pain pathway:
  - Spinal cord (superficial dorsal horn) that project to and from the brain

To cure chronic pain means having to cure Central Sensitisation:
Nil at present



Central Sensitisation

Consequences:

- *Lowered* pain threshold
- *Amplified* pain response that is *perpetuated*
- *Spontaneous* pain generation (phantom limb pain model)
- *Recruitment* of other parts of the body to experience pain due to expansion of sensitised SC fields
  - Focal > Local > Regional > Generalised (fibromyalgia)

Associations with CS

Sensory:

- Persistent pain
- Allodynia
- Pain amplification
- Distortion of normal sensation

Physical:

- Muscular hyperirritability
- "Trigger points"
- Loss of "body awareness"
- Loss of sequencing/coordination

Central Sensitisation

Visceral / ANS dysfunction:

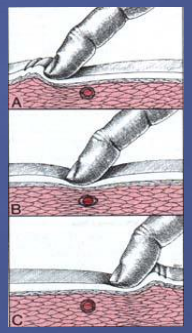
- Irritable bladder/bowel
- Vascular changes
- skin/hair/nail/sweating

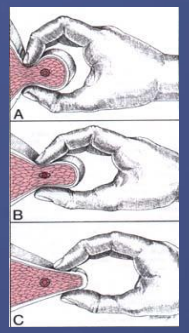
Cognitive / Behavioural:

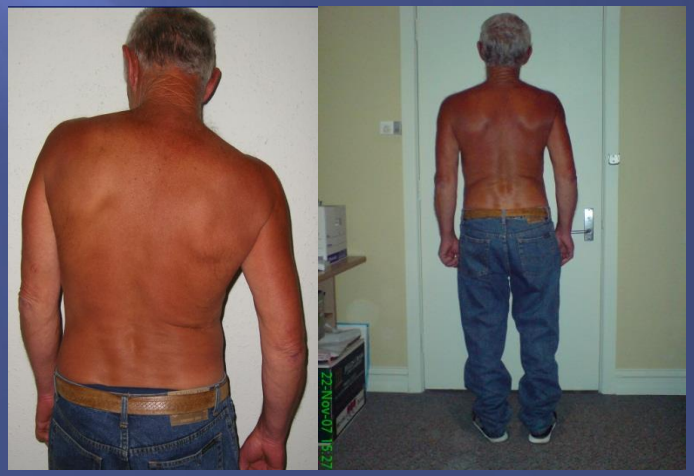
- Memory / Learning deficits
- "Hypervigilance"– Insomnia
- Irritability / reduced tolerance
- Anxiety / depression

Physical / Function Issues

- Musculoskeletal:
  - Trigger Points
  - Loss of flexibility
  - Loss of "Body Awareness"
  - Deconditioning
    - Also psychological deconditioning







Functional Capacity

- Central Sensitisation = lowered pain threshold
  - Pain can be experienced/amplified at lower levels of physical activity and persistent – much lower than injury/impairment
  - Therefore, lowered functional capacity commensurate with lowered pain threshold
  - Appropriate work = Part-time employment to be "meaningfully occupied"

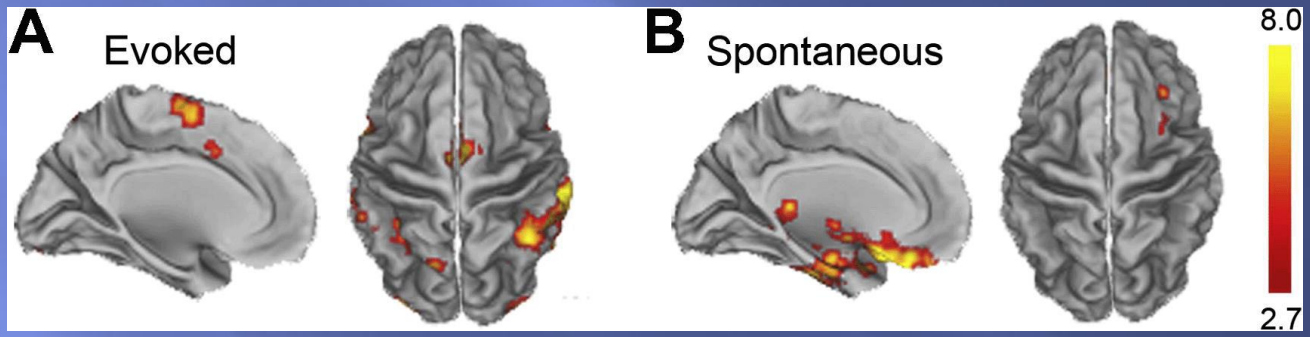
New IASP Definition of Pain:

An aversive sensory and emotional experience typically caused by, or resembling that caused by, actual or potential tissue injury

IASP = International Association for the Study of Pain

Evoked vs Spontaneous Pain in OA

Brain activity for chronic knee osteoarthritis: dissociating evoked pain from spontaneous pain *Eur J Pain* 15 (8), 843-851



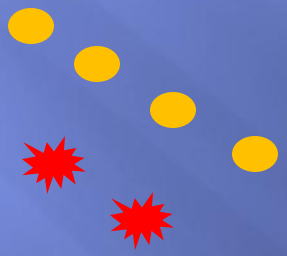
A. Knee pressure-evoked pain activated brain regions commonly observed for acute pain

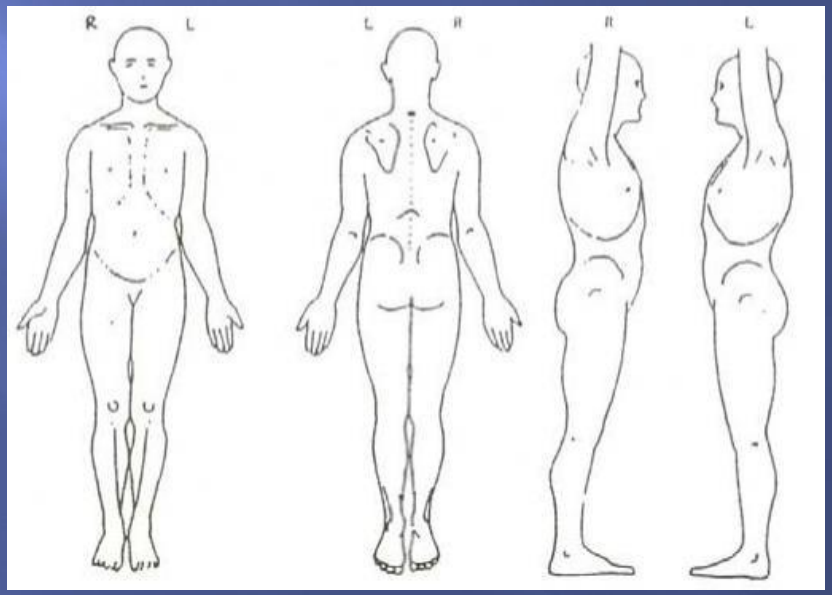
B. Spontaneous OA pain engaged medial prefrontal-limbic cortical areas, indicating that it is more of an emotional state

Brief Pain Inventory (BPI)

On the diagram, either move the yellow circles onto, or shade in the areas where you feel pain.

Drag the red "bomb" or mark an X on the area that hurts most.





Please mark with an 'X' above the one percentage that best shows how much relief you have received from pain treatments or medications in the last week.

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

No relief

Complete relief

Brief Pain Inventory (BPI)
Pain Severity

Please rate your pain with an 'X' above the one number that best describes your pain **at its worst in the last week**.

0	1	2	3	4	5	6	7	8	9	10

No pain — Pain as bad as you can imagine

Please rate your pain with an 'X' above the one number that best describes your pain **at its least in the last week**.

0	1	2	3	4	5	6	7	8	9	10

No pain — Pain as bad as you can imagine

Please rate your pain with an 'X' above the one number that best describes your pain **on average**.

0	1	2	3	4	5	6	7	8	9	10

No pain — Pain as bad as you can imagine

Please rate your pain with an 'X' above the one 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

Divide by 4 for score out of 10

Brief Pain Inventory (BPI)
Pain Interference

a. **General activity**
b. **Mood**
c. **Walking ability**
d. **Normal work (includes both outside the home and domestic duties)**
e. **Relations with other people**
f. **Sleep**
g. **Enjoyment of life**

0	1	2	3	4	5	6	7	8	9	10

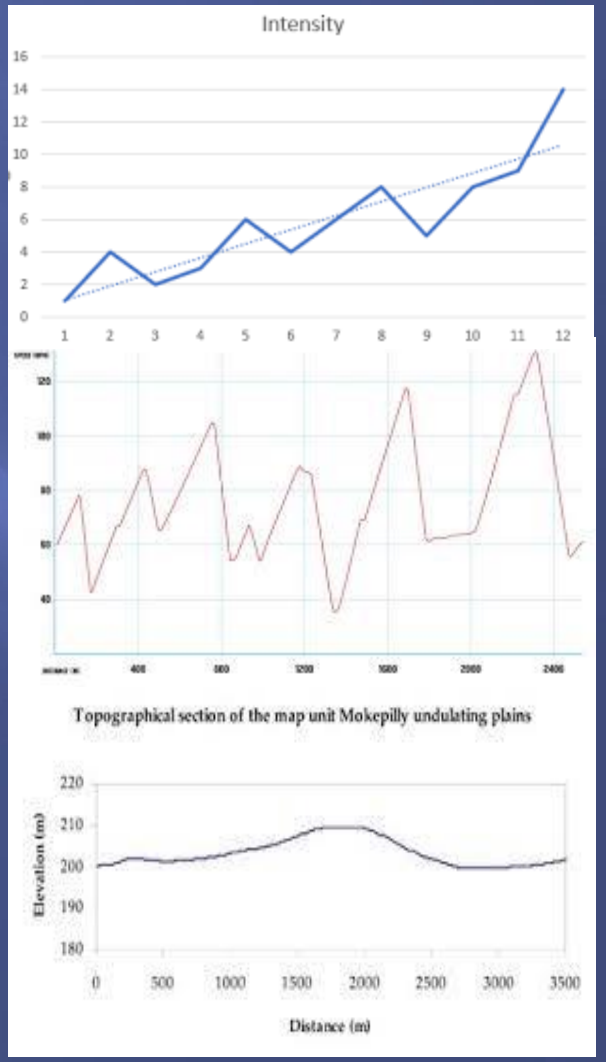
Does not interfere — Completely interferes

Divide by 7 for score out of 10

Interpretation of Pain Experience

- Severity of Pain = Perception of being "In Control"
- Pain Interference – degree of perceived disability
- Fluctuating levels of pain = Coping Resilience
- Managing pain is about managing an individual's Emotions

– increasing "In Control"



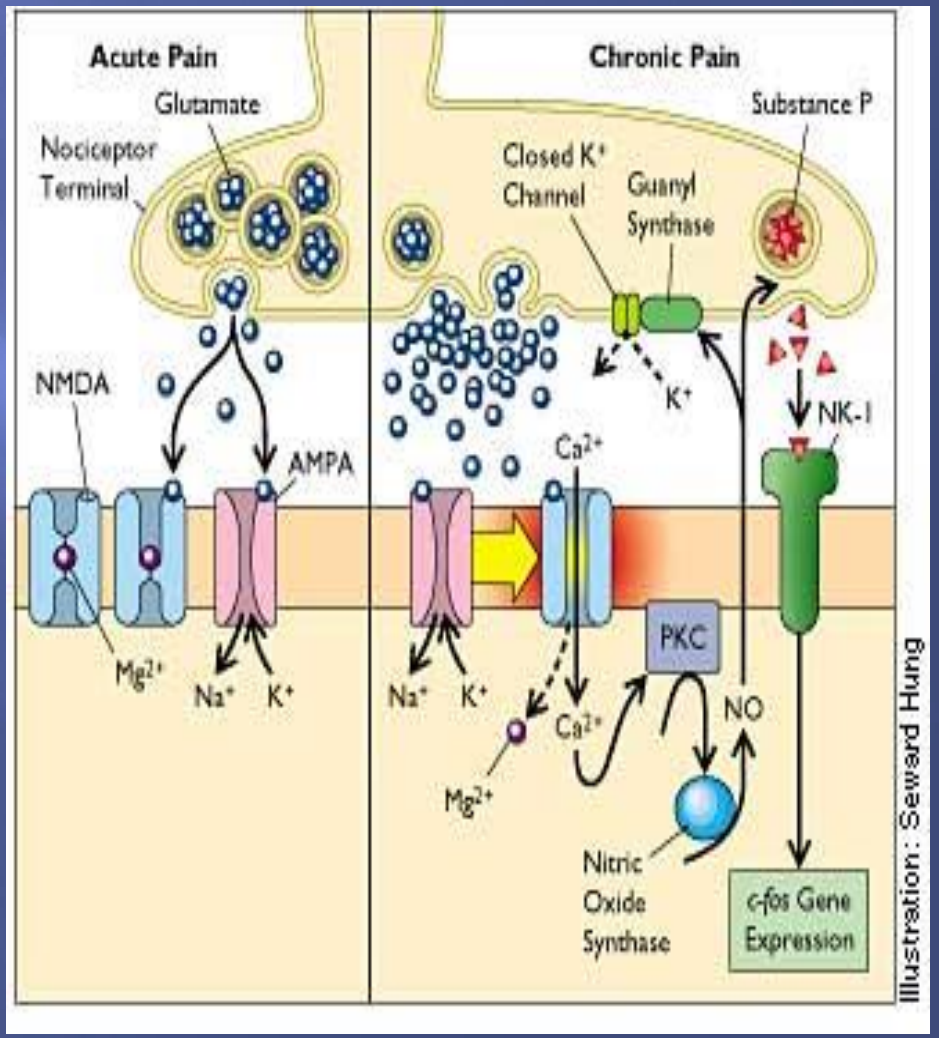
Acute *vs* Chronic (Persistent) Pain

ACUTE

- Known cause
  - Nociception
    - Inflammatory
    - Neuropathic
- Treatment available
- Cure expected
- Limited time course

CHRONIC (*> 3/12*)

- Known & unknown [multiple] causes
- Adequate treatment not available
- Cure not available
- Indeterminate time course



Chronic Pain: 2 Concurrent Intertwined Processes

- Single episode Injury OR Persisting Pathology e.g. Osteoarthritis, Neural Impingement
  - Nociceptive
  - Inflammatory
  - Neuropathic
- Person's Response to Pathological process
  - Perpetuate/Aggravate Pain Condition:
    - Central Sensitisation
    - Psychological reaction
    - Physical/Function Deficits

Chronic Pain as a DISABILITY > Rehab Medicine Model of Mx

Whole person dysfunction

(psychosocial/physical/medical components)

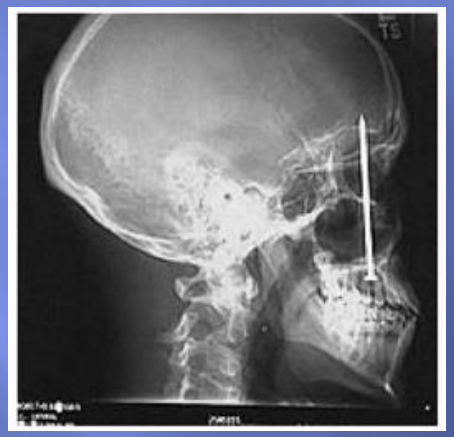
[as consequence of a previous or ongoing Impairment]

PsychoSocial Component =

Major determinant of Prognosis

Internal vs External locus of control

- Belief System



- Poor adaptability
  - Acceptance:
    - *No* cure for chronic pain
    - Chronic pain *Does Not* equate to persistent and/or recurrent injury
  - Adjustment to changed circumstances

- Psychological readiness
  - *Active* participant – increase internal locus of control = psychological preparation

Aim of pain rehabilitation program:

To get back “IN CONTROL”

= The ultimate desensitisation therapy

Program Structure

- Pain Team
  - Nurse, Physio, O/T, Psychologist +/- Psychiatrist
- Inpatient 2 weeks > +/-O/P > R/Vs
  - Group education and individual application
    - Emotional, physical, functional activity desensitisation
    - Low dose, adjunctive Ketamine infusion
- Historical – Outpatients only – 2X/week for 8 weeks and then 4-6, monthly team R/vs
  - "Residential stay"
- May need ongoing psychological/psychiatric therapy (community)

Pain Rehabilitation Programme
Patient Information

- You have been referred by your doctor/surgeon for assessment and management of your Pain Condition.
- Read this handout carefully as it is important that you understand the information. Without this understanding, the pain rehabilitation program *will not work for you.*
- If you have any questions about the information, please ask your pain medicine doctor at the next appointment. He will assess your suitability and readiness to enter the North Eastern Rehabilitation Centre pain rehabilitation program.

Acute Pain

Acute or nociceptive pain is pain caused by injury – tissues are damaged and inflammatory chemicals released, resulting in a combination of pain, local heat, redness, swelling and loss of normal function.

For the vast majority of people, as the injury heals, the pain resolves. This usually occurs within 3 months of suffering the injury. In some people and for reasons that are still unclear, even though the injury heals, pain persists.

Chronic or Persistent Pain

When pain has persisted beyond **3** months, it is defined as ***chronic or persistent pain***.

The causes of chronic or persistent pain are complex, multifactorial and different from those of acute pain. The scientific research has pointed in the direction of **Pain Sensitisation**. As a consequence of suffering pain, one's pain system can become "irritable", leading to changes in structure and function.

The pain system is a protective mechanism. It normally collects pain messages from the injured body part(s) and transmits them to the brain, making the person aware that they are about to suffer injury or that tissues have already been damaged. When the injury heals, these pain messages stop and acute pain resolves. In people where the injury heals but pain persists, there is a vast body of research evidence to demonstrate that the pain system has changed, resulting in the development of **Pain Sensitisation**.

The consequences of Pain Sensitisation include:

- A ***lowered pain threshold*** so that pain can be caused at much lower levels of activity and not by injury. When sensitisation is severe, attending to one's daily routine can be painful.
- ***Pain Amplification***, so that the longer one suffers pain, it can become increasingly severe.
- ***Spontaneous pain***, where injury can heal but pain can persist. Thus, persistent pain does not need to be caused by ongoing injury as the pain is now being generated by the pain system itself e.g. phantom pain after amputation of a limb. This explains not only the constant pain one can suffer, but also the sudden and unpredictable attacks (***flares***) of increased pain that can occur without further or new injury.
- ***Recruitment* or the spread of pain** to affect other parts of the body irrespective of whether that part had suffered an injury or was previously painful e.g. the opposite side of body or even the whole body.

Pain Rehabilitation Programme
Patient Information

Other conditions associated with Pain Sensitisation

- Persistent muscular hyperirritability known as Myofascial Pain Syndrome, with very tender "trigger points" in the muscle tissue that can trigger or refer pain to other parts of one's body, even mimicking nerve pain;
- Biomechanical imbalance due to altered posture and movement patterns that serve only to maintain hyperirritable muscles, increase stress on joints and other body parts to cause pain;
- Increasing emotional reaction which in turn, can further increase the severity of the pain. These emotional reactions include frustration, anger, disillusionment, cynicism, anxiety and depression.
- Reduced ability to tolerate daily stresses e.g. people and crowds, noise, light, movement etc.

TO DATE, THE RESEARCH HAS INDICATED THAT THERE IS NO CURE FOR CHRONIC OR PERSISTENT PAIN, ONCE PAIN SENSITISATION IS ESTABLISHED.

The North Eastern Rehabilitation Centre Pain Rehabilitation Programme

The NERC Pain Rehabilitation Programme is aimed at providing the person suffering chronic or persistent pain an *opportunity* to learn to become their own pain therapist and pain manager through learning practical *self-treatment and self-management* techniques and strategies so that:

- Pain can be reduced
- Function can increase, including returning to employment and ultimately
- One's quality of life can be improved.

Achieving pain cure is not a goal of this program.

Your team includes a combination of pain medicine doctor, physiotherapist, occupational therapist, psychologist, psychiatrist, nurse and social worker. The program is customised to the needs of the person and delivered by a one-on-one basis.

Your Responsibility

Your NERC pain rehabilitation programme can provide you with the opportunity to achieve an improvement in your pain condition and quality of life. This can only occur if you accept responsibility for becoming your own pain therapist and pain manager through being actively involved in your own therapy.

Please read the above carefully. If you have any queries, discuss them with your pain medicine doctor.

North Eastern Rehabilitation Centre
Information compiled by Dr Terence C Lim, Pain Medicine Specialist and the NERC Pain Team (Nov 2010)

Ketamine Protocol

- Utilisation of Ketamine as "Adjunctive Therapy" as its pain-reducing effects are temporary and it does not cure anything
- NMDA receptor antagonist (pathway of central sensitisation)
- 4mg/ml
- Commence at 1 ml/hr
- Increase by 1 ml/hr BD to 3ml/hr (4ml/hr)
- 2nd daily LFTs
- Wean by 1 ml/hr BD to 0 after 8 days or before, if LFTs increase

Ketamine Handout

Ketamine
Patient Information

North Eastern Rehabilitation Centre

Your doctor has prescribed a low-dose Ketamine infusion as part of your treatment whilst in hospital.

What is Ketamine?

Ketamine is a medication prescribed as an adjunctive treatment of chronic pain and can also be utilised to assist with the withdrawal of medication such as Opioids – morphine-based analgesics.

What does it do?

The aim of the low-dose Ketamine infusion is to reduce your pain. It can reduce the required dose of analgesic medications.

Ketamine may also be used to maximise your ability to improve movement and activities during your rehabilitation so that you can: (name activities. Due to being on a low dose you will be able to actively participate in your rehabilitation programme.

How is it delivered?

Low dose Ketamine Infusions are delivered by a subcutaneous (S/C or under the skin) access device – this is a small cannula (needle) inserted into the subcutaneous tissue under the skin. The main area of insertion is in the abdomen but the upper arm or thigh may be used.

Your infusion will commence at a low rate and gradually be increased as per your doctor's orders.

The average length of the infusion is 5 - 10 days. The effects of the Ketamine infusion can take up to 3 days to be observed. Your Ketamine infusion will be slowly weaned down and then ceased prior to you going home.

Is there anything else I need to know?

Your infusion will be monitored hourly, so you will need to return to your room for this to occur. During the course of the infusion you will have second-daily blood tests.

The Ketamine pump will need to be removed for showers, hydrotherapy and leaving the hospital. Please notify your nurse and allow enough time to remove the pump when required. This includes going for a walk outside the hospital grounds.

North Eastern Rehabilitation Centre
134 Ford Street, Ivanhoe VIC 3079
Phone: 03 9474 8800 | Fax: 03 9499 9341 | www.northeasternrehabilitationcentre.com.au

Ketamine
Patient Information

North Eastern Rehabilitation Centre

Side Effects

Possible side effects (especially at high doses which are not part of this program) can include:

- Headache
- "Feeling weird"
- Hallucinations
- Increase in blood pressure and / or pulse
- Nightmares
- Numb, tingling lip
- Heightened emotional response
- Increases in liver function tests (LFT's)
- Limb jerking (extreme cases)

If you experience one of the above signs or are concerned about how you feel, report this to your nurse. If required, your nurse will contact your doctor. Your infusion can be turned down or off at any time and the side effects usually subside within a short period of time.

Infection is one possible complications of having a device in place.

To help prevent infection:

- Wash your hands thoroughly before touching the device and/or utilise the hand sanitiser
- Only touch the device or anything attached to it when you have to.
- Remind others who touch your device to clean their hands first.
- Advise the nurses if the dressing covering the device starts to lift off.
- If you notice that the area around the device is painful, red, hot or swollen, please notify the nurse immediately. The pain and redness can be at entry site of the cannula or the surrounding skin.

For the ketamine pump to function efficiently, do not 'play' with your pump – if the alarm is sounding, call for your nurse.

Tampering with the equipment may result in treatment being ceased.

If you have any queries regarding your treatment, please talk to your nurse or doctor.

North Eastern Rehabilitation Centre
134 Ford Street, Ivanhoe VIC 3079
Phone: 03 9474 8800 | Fax: 03 9499 9341 | www.northeasternrehabilitationcentre.com.au

WC/TAC Pain Inpatient Admissions 2024:

BPI Pain Severity/Interference	Adm S/I	Disch S/I	3/52 S/I
• RK (17/01/2024)	6.6/7.5	1.3/1.4	3.7/3.2
• DM (18/01/2024)	3.5/5.43	4.0/3.7	6.5/5.4
• HK (29/01/2024)	5.3/10	3.0/3.8	4.0/8.4
• AH (5/02/2024) (TAC)	6.5/7.7	4.5/3.8	5.3/5.4
• DU (11/02/2024)	5.9/8.2	3.3/3.3	3.5/3.8
• VN(11/03/2024)	7.0/8.9	3.8/4.3	6.3/5.9
• GH(17/03/2024)	7.8/9.4	2.5/2.4	3.4/3.2
• DP (31/03/2024)	7.5/8.8	5.0/9.1	8.8/9.1
N =8 Average	6.3/6.3	3.4/4.0	5.2/5.6

Medications

- Analgesics - No
  - Simple / compound
  - Opioids
- Pregabalin (*Lyrica*) / gabapentin (*Neurontin*) - No
  - α2δ receptor in CNS = analgesic
- Antidepressants:
  - TCA – amitriptyline - Sometimes
  - SSRIs / SNRIs
    - Duloxetine (*Cymbalta*) - dual inhibitor of serotonin and norepinephrine reuptake - Yes
- Muscle relaxants - No
- Seroquel (quetiapine) – Yes
  - To assist with "wind down" during 24 hour cycle including sleep

"Pain Procedures"

- Surgery/Procedures - symptomatic relief only
  - Facet joint/medial branch blocks
  - ganglion/sympathetic plexus blocks
  - Radiofrequency denervation
- Intrathecal pump (opioids) – historical interest
  - Tolerance
  - Opioid-induced hyperalgesia
- Spinal cord stimulation

Spinal surgery requests at WorkSafe Victoria

(from 1 July 2017)

Spinal Surgery Advisory Panel

- Advises WorkSafe on Spinal Surgery requests and billing

Multi Disciplinary Independent Medical Examinations

- Spinal Surgeon and Pain Medicine Specialist
- For the most complex requests including LSF
- Where surgery not appropriate, alternative treatment recommendations made about other possible treatments

Spinal Surgery MD IME Questions:

- 1. What is the diagnosis/condition with respect to the claimed injury?
- 2. What are the injured workers expectations of the surgery outcomes? In your opinion are these expectations reasonable?
- 3. Is the service of (the operation requested) appropriate for the claimed injury? If not, why?
- 4. Are there other or more appropriate services (alternative operations or pain management strategies) which would be applicable for the claimed injury?

12 months of MD IME's

Referrals 267

Completed 248

Recommendations

Surgery Recommended 37%

Surgery Not Recommended 63%

Additional Initiative

Co-consults between pain proceduralist and pain rehabilitation

Thank You