

2017 GLOBAL YEAR
AGAINST
PAIN
AFTER SURGERY

Chronic Post Surgical Pain (CPSP); What is new?

Dr PTR Makuloluwa
*Faculty of Medicine
KDU*

CPSP

- ❑ CPSP is one of the most common and serious complications after surgery
- ❑ However unlike acute pain which is predictable, CPSP following surgery is unpredictable
- ❑ CPSP has been a neglected entity until recently
- ❑ However in the recent past, many researchers have highlighted the magnitude and its bio-socio-economic impact on patients
- ❑ Reports suggest that 1/3rd of patients develop CPSP (following both minor & major surgeries)
- ❑ However, it is also shown that it's a condition difficult to diagnose and costly to treat with enormous socioeconomic impact

Impact of CPSP on patient, family & society

□ Physical & psychological effects:

leading to unfavorable patient experiences

□ Undesired clinical outcomes

affects quality of life

□ Socio-economic effects:

social stigma

heavy burden on health costs

Different types of pain or pain syndromes

with *several underlying mechanisms*
even after the same operation

**No universally agreed definition for
CPSP**

*Therefore
CPSP is difficult to diagnose*

Working definition of CPSP (IASP)

- Pain of at least three months duration after the surgery
- Pain not present before surgery or that has different characteristics or increased intensity from preoperative pain
- Pain is localized to the surgical site or to a referred area
- Other causes for the pain have been excluded
(malignancy, infections)

Proposed by Macrae and Davies
Subsequently refined by Werner

Prevalence & Severity

- Estimated prevalence of CPSP from epidemiological studies vary widely
- **10 to 30% of patients** report some degree of persistent pain at one year postoperatively
- **5% of all patients,** report severe, disabling pain at one year postoperatively
- **higher prevalence (>40%)** observed after major thoracic surgery

Mechanisms of CPSP

Complex and unclear

Following the same surgery,

- different types of pains are reported
- with different likely mechanisms

**** Phantom pain, stump pain and back pain in amputees**

Likely mechanisms

□ Neuropathic pain

caused by surgical injury to major peripheral nerves

□ Nociceptive pain

- caused by persistent inflammation following nerve injury with release of sensitizing inflammatory mediators

□ Neuroplasticity

- decrease in the threshold of nociceptors (**peripheral sensitization**)
 - increase in the excitability of neurons in the CNS

(**central sensitization**) with ex-aggerated responses to regular sensory inputs

CPSP

Mechanisms

- **Neuropathic pain (nerve injury)**
- **Nociceptive pain (inflammation)**
- **Neuroplasticity**

Majority, present with manifestations of **neuropathic pain** (surgical nerve lesions)

In a minority, continuous inflammatory response produce **inflammatory pain** (mesh hernia repair)

Aetiology of CPSP

- Not well understood
- However **biological, psychological and social factors** have been implicated

Key predictors of CPSP

- ❑ Type of surgery (85% - amputation; 1% - cataract)
- ❑ Preoperative pain at the operative site
- ❑ Acute postoperative pain (severity & duration)
 - a major determinant
 - evidence of acute neuropathic pain at the site
- ❑ Psychosocial factors
(emotional instability, stress, anxiety)
- ❑ Chronic preoperative pain (headache etc)

Risk Factors for CPSP

- Recognition of “high risk” patients (pre-op)
- To ensure “preventative measures”
- Thereby reduce incidence of CPSP (post-op)

Risk factors for CPSP

- ❑ Surgery itself “*No surgery; no pain*”
- ❑ Type of surgery
- ❑ Preoperative pain (acute or chronic)
- ❑ Postoperative pain - severity / type (acute neuropathic)
- ❑ Genetic predisposition
- ❑ Psychological factors
- ❑ Younger age & gender (women > men)

Association with type of surgery

Type of surgery influence both the

incidence of CPSP and its severity

- ❑ **Thoracotomy (30-50%)**
- ❑ **Mastectomy (20-50%)**
- ❑ **Amputation (50-85%)**
- ❑ **Knee arthroplasty (20%)**
(10%)
- ❑ **Hernia repair (5-35%)**
- ❑ **Vasectomy (5-18%)**
- ❑ **LSCS (6-10%)**
- ❑ **Hip arthroplasty**

Preoperative Pain

The existence and intensity of preoperative pain at or near operative site is a risk factor for the development of CPSP

Age of patients

Younger patients are more likely to develop CPSP

Increasing age is inversely related to the development of CPSP

Genetic predisposition

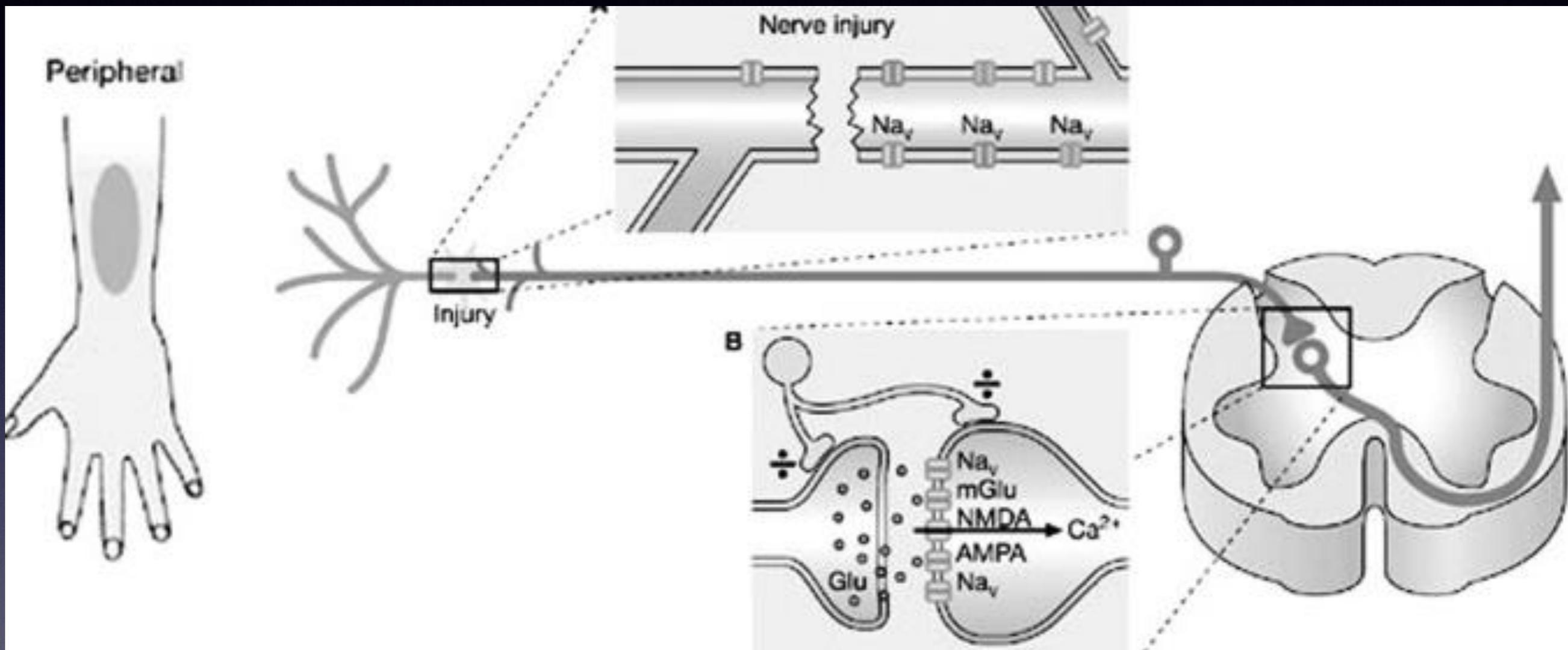
- ❑ Susceptibility to develop pain is known to be influenced by several genes
- ❑ Failure of neural changes to return to normal have shown a **genetic basis**; there are **environmental factors** making mechanisms complex
- ❑ Fibromyalgia syndrome, migraine, irritable bowel syndrome, irritable bladder, Raynaud's Syndrome have been shown to be "**markers of CPSP**"

Psychological factors

- ❑ **Preoperative anxiety** is a risk factor for CPSP; incidence is affected by catastrophization (exaggerated negative beliefs and responses)
- ❑ **Fear of surgery** predicted increased pain at six months postoperatively, independent of the type of surgical procedure and other somatic factors
- ❑ Therefore the use of **stress relieving methods prior to surgery** have a place in preventing CPSP
- ❑ **Time spent explaining the complexity of the problem** to patients will often help them reach a state of acceptance as a recognized complication of surgery

Intra-operative factors

- ❑ CPSP reported in more than 50% of patients with surgery associated with significant nerve and tissue damage
- ❑ Link between nerve damage and the development of CPSP is complicated. Not all patients with nerve damage develop CPSP, and those who do develop CPSP do not necessarily show features of neuropathic pain
- ❑ Longer and complicated operations (more than 3 hours) are associated with chronic pain, poor functional outcome and poor global recovery
- ❑ Laparoscopic surgical approaches result in less chronic pain after hernia repair and cholecystectomy
- ❑ Repeat surgery for hernia repair has a higher incidence of moderate to severe pain intensity at 12 months compared with primary repair



Post operative pain

- ❑ The **severity of postoperative pain** significantly predicts the development of CPSP, supporting the hypothesis that repetitive nociceptive stimulation with central sensitization
- ❑ **Severe pain after lower limb amputation** predicts CPSP in the phantom limb
- ❑ **Laparoscopic cholecystectomy** compared to open procedure, **less likely to develop CPSP**
- ❑ **Lower incidence of CPSP after spinal anaesthesia** compared to epidural could be due to '*stronger blockade*' of '*central impulse traffic*'; **CPSP higher among LSCS done under GA compared to spinal**
- ❑ The evidence clearly shows the importance of **control of pain during the acute postoperative period**
- ❑ **Radiotherapy & chemotherapy** increase the risk of developing chronic pain after surgery

Preventive Measures of **CPSP**

Since treatment of CPSP is difficult due to various reasons, its **prevention is considered as a priority**

Main focus is on

- Elimination of risk factors
(especially avoidance of unnecessary surgery)
- Effective control of post surgical pain

Pre-emptive analgesia

- Pre-emptive analgesia is defined as anti-nociceptive treatment which prevents sensitization of CNS that amplifies postoperative pain
- Has shown overall beneficial effects with selected analgesic regimens such as epidural analgesia, wound infiltration, and systemic NSAIDS
- Limited efficacy and benefits unless continued into post operative period

Use of Preventative regional analgesia

- Preventative analgesia is given in the perioperative period, which has an effect that extends beyond the duration of other drugs used
- In contrast to pre-emptive analgesia, preventative regional analgesia has demonstrated some promising results, although data are limited
- Epidural analgesia, paravertebral blocks when commenced before surgery and continued into the postoperative period reduces the incidence of CPSP
- It is likely that sufficient afferent block established before the surgical incision and continuing well into the postoperative period reduces the nociceptive barrage that results in central sensitization.

Place of peri-op use of adjuvant analgesics

- Preoperative use of oral gabapentin has shown a decrease in the incidence and severity of CPSP
- Gabapentin used with local anaesthetics has shown to reduce the incidence of chronic pain in patients having breast cancer surgery
- Perioperative i.v. ketamine infusion has shown to prevent development of CPSP in patients undergoing mastectomy, thoracotomy, and rectal cancer surgery
- Clonidine, when used in conjunction with local anaesthetics in regional anaesthetic techniques, may also reduce the incidence of CPSP

- Limited data to suggest that **multimodal analgesic techniques** (such as a combination of local anaesthesia and gabapentin or intra-articular bupivacaine, morphine, and clonidine) may help reduce CPSP
- Treating all patients with perioperative drugs in the hope of preventing conversion to chronic pain is both **impractical** and **costly** as these **drugs are not without side-effects**
- Hence, the challenge is to **accurately predict and identify susceptible patients** who are at greatest risk of CPSP and to **enable targeted prevention**
- **Psychological measures** have a definite place
- **CBT based physical therapy for 6 weeks prior to surgery** has shown positive results in patients at risk

Key Points

Many of the risk factors identified are uncertain or difficult to influence

However, **a positive impact can be made by focusing on the following:**

- **Controlling severity of acute post-operative pain**

 - Treating acute post-operative pain as effectively as possible

- **Preventing unnecessary or inappropriate surgery**

 - Education of patients and general public** about CPSP

 - Help patients to **make informed decisions** to avoid unnecessary surgery; alternatives to surgery should be encouraged in **cosmetic surgery**

- **A multi-modal approach to preventative analgesia**

- **Attention to psychosocial risk factors**

References:

- ❑ IASP - FACT SHEET No. 4 – Chronic Post Surgical Pain
- ❑ Chronic Post-surgical Pain w.a.macrae@dundee.ac.uk
- ❑ RD Searle, KH Simpson; Chronic post-surgical pain, *Continuing Education in Anaesthesia Critical Care & Pain*, Volume 10, Issue 1, 1 February 2010, Pages 12 -14, <https://doi.org/10.1093/bjaceaccp/mkp041>
- ❑ Julie Bruce, Jane Quinlan; Chronic Post-surgical Pain, *Rev Pain*. 2011 Sep; 5(3)
- ❑ Taylan AKKAYA,¹ Derya ÖZKAN¹; Chronic post-surgical pain, *AĞRI* 2009;21(1):1-9



Thank you