



- **FACT SHEET No. 4**

## **Chronic Postsurgical Pain: Definition, Impact, and Prevention**

A working definition of chronic postsurgical pain (CPSP) was proposed by Macrae (BJA 2008) and subsequently refined by Werner (BJA 2014):

- Pain persisting at least three months after surgery (various authors propose thresholds of duration from two to six months).
- Pain not present before surgery or that has different characteristics or increased intensity from preoperative pain.
- Pain is localized to the surgical site or a referred area.
- Other possible causes of the pain are excluded (e.g., cancer recurrence, infection).

CPSP has become a health priority and is scheduled to be included in the upcoming version of the International Classification of Diseases, ICD-11 (Treede, 2015).

### **Estimates for the incidence and severity of CPSP vary substantially depending upon study methodology (including how it is defined):**

- CPSP occurs in roughly one or two of 10 surgical patients and is intolerable after roughly one of every 100 operations. In a large observational study, 2.2 percent of postoperative patients reported severe CPSP (i.e., NRS greater than 6, on a scale from 0 to 10) one year after surgery (Fletcher et al, EJA 2015).
- The type of surgical procedure influences both the incidence of CPSP (e.g., 35 percent after thoracotomy and breast surgery, 20 percent after knee arthroplasty, and 10 percent after hip arthroplasty) and its intensity (e.g., joint arthroplasty is greater than gynecological or other visceral operations).



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- Laparoscopic procedures and minimally invasive approaches are associated with similar incidence of CPSP (cholecystectomy, hysterectomy) or only slightly lower incidence (mastectomy, inguinal hernia).
- Incidence rates of CPSP are similar for comparable procedures conducted in inpatients or outpatients (Dualé et al, 2014; Hoofwijck et al, 2015).
- Detailed estimates of incidence and severity of CPSP in certain populations such as children or those with cognitive impairment remain to be defined (Nikolajsen et al 2014).

**CPSP typically involves both nociceptive and neuropathic components.**

- Neuropathic features occur in approximately 30 percent of patients with CPSP, a prevalence that varies according to the type of operation (e.g., higher after thoracotomy or mastectomy, lower after hip or knee arthroplasty) (Dualé et al, 2014; Haroutounian et al, 2013).
- Prevalence estimates of neuropathic CPSP depend upon the screening instrument used to identify it (Haroutounian et al, 2013).
- Nerve lesion is an important although not the sole risk factor for neuropathic CPSP; partial nerve lesion should be avoided by employing nerve-sparing incisional techniques when feasible (Martinez et al, 2012).

**Prediction of CPSP might in theory allow preemptive targeting of individual patients at risk:**

- Clinical factors predict approximately 70 percent of CPSP risk (Montes et al, 2015): type of surgery, age, physical and mental health, and preoperative pain (at the surgical site or other location).
- A prospective risk-factor analysis (Althaus et al 2012) identified five key predictive factors: emotional overload/overstrain, preoperative pain at the operative site, other chronic preoperative pain (e.g., headache), acute postoperative pain, and comorbid stress symptoms such as tremulousness, anxiety, or disturbed sleep (including preempting or treating either of the latter two symptoms with medication).
- Preoperative use of opioid increases the risk of CPSP with an RR of 2.0 (95 percent confidence interval, 1.2-3.3) (VanDenKerkhof et al, 2012).
- Postoperative pain is an important determinant of the development of CPSP, particularly the duration of severe pain after surgery, i.e., the amount of time spent in severe unrelieved pain rather than, for example, a single peak pain intensity rating (Fletcher et al, 2015).
- Early neuropathic pain might predict neuropathic CPSP (Martinez et al, 2012).

However, like many clinical risk-predictive instruments these above findings lack perfect specificity or sensitivity and so are best viewed as broad guides rather than precise formulas. To date, a search for genetic risk factors has produced negative results (Montes et al 2015).

## Prevention of CPSP (Andreae and Andreae 2012; Chaparro et al, 2013):

- Regional anesthesia may reduce the risk of CPSP in some patients.
  - Epidural analgesia may prevent CPSP after thoracotomy in one patient out of four thus treated.
  - Paravertebral block in breast cancer surgery may prevent CPSP in one of five women.
- Ketamine infused perioperatively has produced some positive findings but not uniformly so (McNicol et al, 2014).
- Gabapentinoids in aggregate lack a significant effect.

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