The Acute to Chronic Pain Transition

Can Chronic Pain Be Prevented?

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KEYWORDS

• Chronic postsurgical pain • Neuropathic pain • Quantitative sensory testing
• Central sensitization • Peripheral sensitization • Ketamine • Gabapentinoids

KEY POINTS

- Chronic postsurgical pain (CPSP) is defined as an unpleasant sensory and emotional experience that persists for 3 to 6 months after surgery.
- There are multiple risk factors for the development of CPSP. These include patient-specific and procedure-specific factors.
- Quantitative sensory testing (QST), psychomimetic testing, and postoperative Verbal Rating Scale and Numerical Pain Scale scores have shown promise for prediction of development of CPSP.
- The mechanism for development of CPSP is currently unknown, but is likely due to peripheral and central sensitization that can occur after persistent acute pain.
- Multimodal analgesia significantly reduces acute postoperative pain, but has yet to be proven to decrease incidence of CPSP. This may be due to inadequate duration of therapy.

INTRODUCTION

Chronic postsurgical pain (CPSP) is defined as the persistence of pain at least 3 months after a surgical procedure. Emphasis is placed on the relation to surgical intervention, as pain attributed to malignancy or infection is not included. Persistence of pain can be a distressing process, leading to increased health care spending and reduced quality of life.[1] **Table 1** identifies incidence of CPSP with common surgical procedures. When these percentages are applied to the estimated volumes of these procedures, we can see that many patients are at risk.[1]

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Table 1
Incidence of chronic postsurgical pain following common procedures

Surgical Type	Incidence of Chronic Postsurgical Pain, %	US Surgical Volumes, 1000s
Amputation	57–62	159
Breast surgery	27–48	479
Thoracotomy	52–61	Unknown
Herniorrhaphy	19–40	609
Coronary artery bypass graft	23–39	598
Cesarean delivery	12	220

Data from Kehlet H, Jensen TS, Woolf C. Persistent postsurgical pain: risk factors and prevention. Lancet 2006;367:1618–25.

Research in the topic has intensified since Crombie and colleagues[2] first described the conversion of acute to chronic pain in 1998. Current studies have focused on identifying risk factors to predict CPSP, elucidating the mechanism, and building analgesic strategies to avoid conversion of acute to chronic pain.

RISK FACTORS FOR DEVELOPMENT OF CHRONIC POSTSURGICAL PAIN

Numerous studies determined risk factors for the development of CPSP. These risk factors are both patient-specific and surgery-specific, as summarized in **Fig. 1**.

Demographic Factors

Risk of developing CPSP is associated with younger patient age and female gender. In the surgical treatment of breast cancer, younger women present with larger breast masses, increased postoperative pain, and develop CPSP more frequently than older patients.[3] A study by Smith and colleagues[4] showed that 65% of women aged 30 to 49 had persistent pain after mastectomy compared with 40% in the 50 to 69 age group and only a quarter of patients older than 70. This trend of increased development of CPSP in younger populations is also seen after hernia repairs.[5]

Gender exhibits importance in the development of CPSP. Katz and colleagues[6] demonstrated that women are at a greater risk than men for both acute and persistent

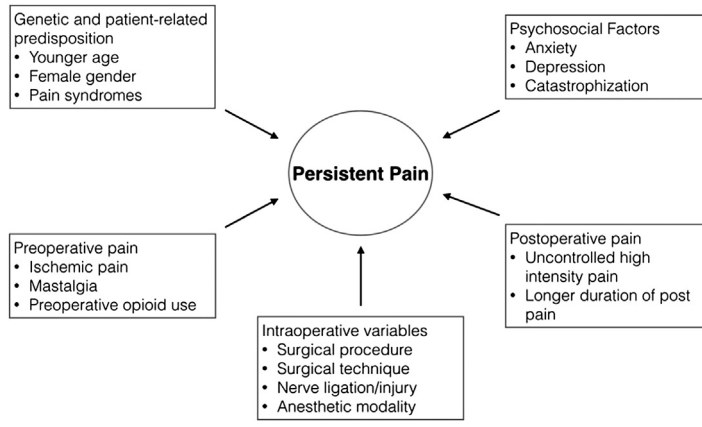

Fig. 1. Risk factors for CPSP following surgery. (*Data from* Refs.[3–6,17,19,20,22,23,25,26,28–33,39])