POP and other risk factors are associated with CPSP (ANZCA, 2010; Kehlet et al, 2006; Macrae, 2008).

The effects of unrelieved postoperative pain are outlined in Table 2. Prompt identification is therefore essential and nurses must have an understanding of the nociception of pain if POP and CPSP are to be accurately identified and effectively managed.

Table 3 lists the risk factors associated with CPSP.

**NOCICEPTION**

Nociception is the term used to describe the neural processes by which a noxious substance or a tissue damaging event such as surgical incision is perceived as pain (Fig 1).

Nociception involves a complex interaction between the peripheral nervous system (PNS) and the central nervous system (CNS). This goes through four stages: transduction; transmission; perception; and modulation.

The tissue damage caused by surgery results in the nociceptive system operating in a “sensitised state” to encourage behaviours that guard the wound from further damage, thus promoting wound healing (Johnson, 2009) (Table 4).

**Transduction**

Noxious stimuli associated with surgery are detected in the PNS by nociceptors of the nociceptive system (PNS) and the central nervous system (CNS). This goes through four stages: transduction; transmission; perception; and modulation.

**Modulation**

Noxious stimuli associated with surgery are detected in the PNS by nociceptors of the nociceptive system (PNS) and the central nervous system (CNS). This goes through four stages: transduction; transmission; perception; and modulation.

**Responses to pain**

Emotional, autonomic, movement, motivational, behavioural

**PERCEPTION**

Brain – neuromatrix

Pain impulses thalamus other centres

**A delta fibres (sensory cutaneous)**

- Heat and cold
- Touch and massage
- TENS
- Hydrotherapy
- Acupuncture

**C fibres (unmyelinated)**

- First pain – superficial, localised, sharp, stinging
- Second pain – deep, poorly localised, ache, dull

**Descending modulatory pain pathway**

- Preoperative information, relaxation, deep breathing
- Distraction, music
- Patient characteristics
- Culture, age, gender, genetics
- Psychological, social, environmental influences
- Patient expectations, beliefs
- Staff skills, knowledge, beliefs, attitudes

**Spinal cord:**

Termination of A delta and C fibre nociceptors

Modulation – inhibitory and facilitatory chemical mediators

**NOXIOUS STIMULATION**

Mechanical (for example surgical incision, inflammation, wound dressing change)

Thermal (for example temperature of wound cleansing solution)

Chemical (for example irritant wound cleansing agent, chemical mediators)

**TRANSMISSION**

Preoperative information, relaxation, deep breathing

Distraction, music

Patient characteristics

Culture, age, gender, genetics

Psychological, social, environmental influences

Patient expectations, beliefs

Staff skills, knowledge, beliefs, attitudes

**DESCENDING MODULATORY PATHWAY**

- Psychological, social, environmental influences
- Patient expectations, beliefs
- Staff skills, knowledge, beliefs, attitudes

**TRANSDUCTION**

Hypertension; tachycardia; coronary ischaemia; myocardial infarction; increased respiratory rate; reduced deep breathing and coughing; secretion and sputum; retention; chest infection; pneumonia, hypoxia

Delayed recovery of gastric and bowel function

Reduced mobility; deep vein thrombosis; pulmonary embolism; metabolic stress response following surgery; muscle spasm; impaired muscle function

Poor wound healing and surgical wound infection; depression of immune system; increased metabolism; changes in endocrine function

Insomnia; anxiety; fear; disorientation; reduction in cognitive function; mental confusion

Larger lengths of stay; readmissions; patient dissatisfaction; reduced quality of life indicators