

# PROCEDURE SPECIFIC POST-OPERATIVE PAIN MANAGEMENT

**Dr. Doris Leung**

**Pain specialist, Princess Margaret Hospital**



Post-surgical pain is the theme of Global year against pain in 2017 of International Association of Study of Pain. This is a very common type of acute pain in hospital and according a study, up to 80% post-surgery patients reported suboptimal pain control, while 20-40% of them experienced severe post-op pain. (1) Apart from the painful experience, there are often associated decrease in patient satisfaction, delayed postoperative ambulation, increased morbidity and mortality rate. Besides, some patients may also develop into chronic postoperative pain which causes patient suffering from months to years.

For the complication due to acute wound pain, most of them are pathophysiological in response to the stress inducted by pain. Patients usually have tachycardia, hypertension and increase myocardial O<sub>2</sub> consumption which may trigger cardiac ischemia. Moreover, there are also increase risk of deep vein thrombosis and pulmonary embolism due to prolong immobilization and deranged clotting status in post-operative period. For the respiratory system, atelectasis and sputum retention are very common in patients with severe wound pain and later development of pneumonia or more serious complication. Persistent pain can also delays gastrointestinal motility and increase catabolic hormones, causing deranged endocrine system such as hyperglycemia, protein breakdown and impaired wound healing. Apart from the physical response, prolonged post-surgical pain can induce anxiety, fear and sleep disturbance, which can further precipitate delayed recovery, immobilization, central sensitization and chronic pain.

A prospective study for side effect from conventional post-operative pain management in 2002 showed that 20% patients experienced vomiting and 24% had excessive sedation. (2) All these factors can further hinder the recovery of post-surgical patient, delay discharge and increase medical cost. Another prospective cohort study in Germany is carried out in 2004-2012, which is part of Quality Improvement in Post-operative Pain Treatment (QUIPS) registry. (3) Over 100000 patients are recruited from 100 hospitals with their pain assessed in first post-operative day. There are 179 surgical procedures identified according to German Surgical Procedure Coding and their analgesic regimen is recorded. Among the patients recruited, the median worst pain intensity is 5 in a scale of 10 and the most painful procedures are spine and some orthopaedic surgery such as shoulder joint replacement and open reduction of calcaneus, which have high pain score of 7. Surprisingly, some minor surgical procedures such as laparoscopic hernia repair, appendectomy, cholecystectomy and myomectomy also rank high in the list with pain score 4-6. On the other hand, major surgeries such as open abdominal and thoracic surgery have usually lower pain score, which are quite opposite to the general impression of health service provider.

The suboptimal pain control for post-operative pain especially in some minor surgery is quite alarming. One of the postulations is that there may be misconception that these procedures are not painful and being ignored, or even with insufficient pain assessment. Besides, the results also reflected that relatively less analgesic are given in which 72% cases received no opioid and lower rate of regional analgesia such as epidural or peripheral nerve block in these minor

procedures. While for major surgeries such as open colectomy, lung or bladder resection, patients are usually received more aggressive treatment thus a general lower pain score. In this study, about 50% patients underwent major surgery received epidural anaesthesia and relatively high dose of opioid if regional analgesia is not applied.

In order to improve pain control after surgery, mechanism of persistent post-operative pain should be considered. There is no direct correlation between noxious stimuli and perceived pain because different surgical procedures bare different pain characteristics as they have various nature of tissue trauma and physiological process. The pain manifestation can be varied as type ( somatic vs. visceral ), location, intensity and duration ( constant vs. episodic ). Besides, efficacy of an analgesic may vary and depends on the type of surgical procedure, while synergism of combinations of analgesics (multimodal analgesia approach) also varies significantly between surgical procedures. For example, oral acetaminophen plus NSAID are more effective for mild-to-moderate surgical procedures while epidural analgesia will be more suitable for more extensive surgeries. However, one cannot apply all aggressive analgesic method to all kinds of surgery because there is risk of invasive intervention or side effect due to excessive pain killers such as NSAID or opioid. Therefore, it is important to balance the risk and benefit of each analgesic regimen and justify the use of aggressive treatment modalities while aiming to improve pain control as well as fast recovery.

In view of high occurrence of post-surgical pain, many centres have adopted different pain management guidelines to offer general advice for analgesic strategies, for instance, ASA Task Force on Acute Pain Management, 2013 and Acute Pain Management, 2010, issued by ANZCA. However, those recommendations usually just provide information or evidence for general management, which may cause information overload and overlap with conflicting evidence without specify for particular type of procedures. Another conventional approach is by comparing different analgesics as Number Need to Treat (NNT) so as to advise for optimal pain control. (Figure. 1) But it also has limitation that the data is adopted from various procedures, which is too general for application. (4)

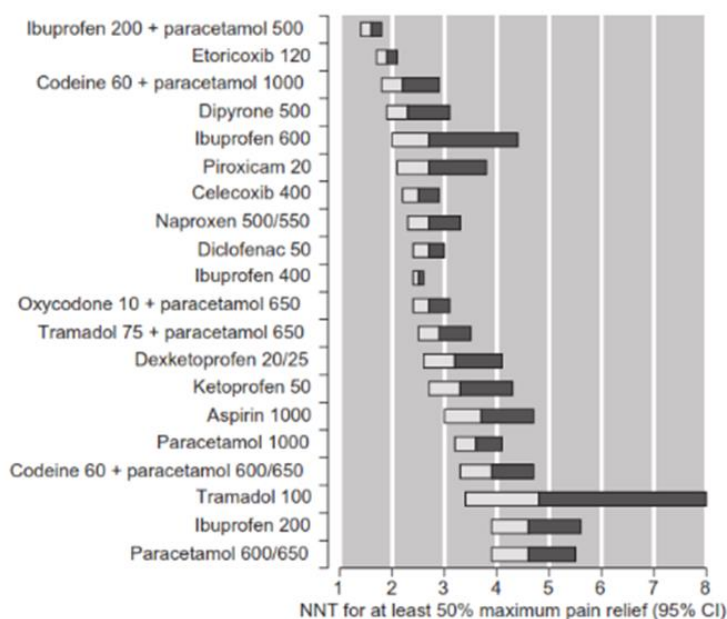


Fig. 1. Numbers need to treat (NNTs) for at least 50% maximum pain relief over 4–6 hours compared with placebo in all acute postoperative trials. CI, confidence interval.

The ideal tool for managing post-surgical pain should be evidence-based and procedure-specific, which can balance between the invasiveness of the analgesic technique and preferred outcome from post-operative pain. For instance, neuraxial analgesia is preferable in thoracic surgery in view of high chance of pulmonary dysfunction and so, aggressive pain treatment is required and prevents serious respiratory complication. While the same invasive strategy may not be appropriate for routine use after laparoscopic colonic resection because of the lesser surgical effect on ileus and pulmonary function. Besides, certain analgesics may have adverse effects on particular surgery and should be avoided for routine use although it may have good analgesic effect generally, such as NSAID is not recommended for tonsillectomy or neurosurgery.

An European working group called PROSPECT ( PROCEDURE SPECIFIC post-operative pain management) using meta-analysis since 2003 to formulate best practice recommendations from current evidence, including systemic reviews on specific procedure and transferable evidence. Consensus is then made for detail recommendations and today, 11 procedure-specific recommendations are published in journals or internet. Those procedures included thoracotomy, breast surgery, colonic resection, laparoscopic cholecystectomy, radical prostatectomy, herniorrhaphy, hemorrhoid surgery, caesarean section, hysterectomy, hip arthroplasty and total knee arthroplasty. Each procedure will be recommended for evidence-based pre-operative, intra-operative and post-operative strategies for best pain management as well as minimizing side effect. Various kind of analgesic options are suggested with evidence being graded, for example, regional analgesia ( epidural , paravertebral or peripheral nerve block ), systemic NSAID or opioid, surgical wound or intra-peritoneal infiltration etc.

The efficacy of launching this new concept is reflected in a study in 2012 by a German group, in which the PROSPECT group showed 25-30% less post-surgical pain when compared to conventional treatment group. (5) The rate of nausea and vomiting, post-operative fatigue, life quality and patient's satisfactory all have more favorable results in the PROSPECT group.

In summary, health care provider should adopt best practice based on current evidence to optimize post-surgical pain. Multi-modal and procedure-specific approach is recommended and analgesic strategies should be adjusted to individual requirement with frequent assessment. And by improving post-surgical pain, together with other important factors such as minimally invasive surgery, optimal fluid therapy, post-operative early mobilization and feeding, so that enhanced recovery after surgery and better patient outcome can be achieved.

#### Reference:

1. Postoperative pain experience: results from a national survey suggest postoperative pain continues to be undermanaged. *Anesth Analg* 2003;97:534-40
2. Effectiveness of acute post-operative pain management: Evidence from publish data. *BJA* 2002;89:40--23
3. Pain Intensity on the First Day after Surgery. A prospective cohort study comparing 179 surgical procedures. *Anesthesiology* (Ari 2013, V118, No.4)
4. Evidence for analgesic effect in acute pain - 50 years on. *Pain* 123(2012) 1364-1367
5. Implementation of the quality management system improves postoperative pain treatment: a prospective pre/post interventional questionnaire study. *BJA* 110(1): 87-95(2013)