

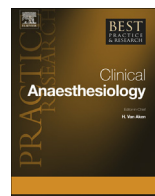


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### Procedure-specific pain management and outcome strategies



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Optimal dynamic pain relief is a prerequisite for optimizing post-operative recovery and reducing morbidity and convalescence. Procedure-specific pain management initiative aims to overcome the limitations of conventional guidelines and provide health-care professionals with practical recommendations formulated in a way that facilitates clinical decision making across all the stages of the perioperative period. The procedure-specific evidence is supplemented with data from other similar surgical procedures and clinical practices to balance benefits and risks of each analgesic technique. There is emphasis on the use of multimodal analgesia and preventive analgesia aimed at reducing central sensitization. Importantly, the benefits of dynamic pain relief may only be realized if other aspects of perioperative care such as the use of minimally invasive surgery, approaches to reduce stress responses, optimizing fluid therapy and optimizing post-operative nursing care with early mobilization and oral feeding are utilized.

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## Introduction

Multimodal, multidisciplinary fast-track surgery, also known as accelerated post-operative rehabilitation or enhanced recovery after surgery (ERAS) pathways, has been shown to reduce perioperative morbidity and enhance functional recovery after surgery and, thus, shorten the duration of hospital stay [1–4]. Optimal dynamic pain relief is considered a prerequisite for the success of fast-track surgery programs [5]. Also, inadequately treated pain may have long-term consequences with regard to the development of chronic pain, which can be a significant economic burden for health systems and societies [6,7].

Although the benefits of optimal pain management are well recognized, the treatment of post-operative pain continues to be a major challenge. Several studies conducted worldwide have reported that a large proportion of patients suffer from moderate-to-severe pain after surgery [8,9]. A recent large observational trial reported that patients undergoing surgical procedures that have the reputation of being less painful received inadequate pain relief. By contrast, patients undergoing highly painful surgical procedures received more aggressive analgesic therapy [9]. The reasons for suboptimal pain management, despite the considerable progress in analgesic pharmacology and techniques of administration, may be related to inadequate or improper application of available analgesic therapies, probably due to the significant amount of new and conflicting information that is increasingly available.

## Conventional approaches that guide pain management

Several evidence-based pain management guidelines are available that offer general advice for optimal pain management [10,11]. These guidelines provide excellent information regarding the overall concepts of optimal pain management as well as the benefits and limitations of available analgesics and analgesic techniques. However, they do not seem to have made any impact on the overall incidence of inadequate post-operative pain management. The failure of these guidelines may be that they are generalized for all surgical procedures and, therefore, may confuse a practitioner who intends to use them for specific surgical procedures.

Another approach that can guide daily practice is the use of number-needed-to-treat (NNT, number of patients that need to be treated with an analgesic to achieve at least 50% pain relief in one patient, compared with placebo) league tables as a guide to measuring efficacy of various analgesics [12]. These NNT league tables allow easy comparisons between drugs. However, there are several limitations of using NNT tables to guide pain therapy. The NNT concept does not take into consideration gradual effects of an analgesic as it sets a cut-off at 50% pain relief compared with placebo. Because the therapeutic objectives may vary based upon patient population and surgical procedures, an analgesic providing 30% pain relief may be considered clinically relevant. However, this may be deemed to be ineffective based on NNT league tables. Furthermore, the clinical significance of a 50% reduction in pain scores may vary based upon the degree of pain at the time of measurement. For example, a reduction from a pain score of 8/10–4/10 would be clinically significant; however, a reduction from a pain score of 4/10–2/10 may not be clinically significant [13,14].

Another important limitation of the guidelines [10,11] and the NNT league tables is that they are derived from multiple surgical procedures with varying pain characteristics (e.g., type (somatic vs. visceral), location, intensity and duration). Because different surgical procedures may result in different types, intensities and locations of pain, the efficacy of an analgesic may vary depending upon the type of surgical procedure (e.g., differing efficacy of paracetamol in different pain models).

Also, the efficacy of combinations of analgesics (i.e., the multimodal analgesia approach) varies significantly between surgical procedures. For example, the combination of paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs) can provide significant pain relief after mild or moderately invasive surgical procedures, but their benefits may be smaller in patients undergoing more extensive surgical procedures receiving epidural analgesia.

It is well recognized that the intensity of pain may not always correlate with the consequential effects on post-operative outcome. For example, the severity of pain after dental surgery may be similar to that after thoracotomy; however, inadequate pain relief after thoracotomy may result in significant

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