

NOL Talk Track

The purpose of this document is to provide you with some key points to focus on during discussions about NOL, to enable you to highlight NOL's clinical utility and latest evidence.

NOL key clinical value propositions

Why use NOL in the operating room?

- **To ensure smoother, more stable procedure and improved patients outcomes** (less post op pain, less hypotension)
- **When using multimodal analgesia** – this method combines various groups of medications for pain relief. NOL can provide an objective reflection of the accumulative effect of the drugs.
- **To validate the effectiveness of regional blocks** – using peripheral nerve blocks is gaining increased popularity. It can promote both effective intraoperative analgesia and postoperative analgesia. However, regional blocks do not always work and NOL can be used to validate the block effectiveness.
- **Validating opioid sparing and opioid free regimens** – the pharmacological interactions in such regimens may not be fully understood. NOL monitoring can be used to confirm its effectiveness
- **High risk patients** – managing analgesia in elderly patients, chronic opioid users, obese patients and other populations can be challenging . Such patient are vulnerable to insufficient or excessive doses of analgesia and benefit from opioid dosing tailored to their requirements.

Here is a recommended talk track with anaesthesiologists:

Optimizing analgesia during surgery is a major challenge, impacting outcomes, length of stay and cost of treatment. Overdose of opioids may result in intraoperative hypotension (increasing risk of organ injury and higher mortality), respiratory depression, PONV etc, while underdose of analgesics may promote acute or chronic pain, delayed recovery, and the costs associated with these complications.

Each patient is different – each has a different pain threshold and different physiological responses to the same painful stimulus. Research has found wide variability in plasma opioid concentrations between patients.¹ Furthermore, Studies have shown a wide range of opioid administration practice across clinicians, depending on their personal beliefs and experiences². Therefore it is vital to monitor each patient's personal response, and personalize the treatment.

Surrogates such as heart rate and blood pressure, are not specific nor sensitive enough to pain.

NOL is a non-invasive monitoring technology providing a simple, objective reflection of the physiological pain response of the patient on a scale of 0 (no nociception) -100 (extreme nociception), displayed on a monitor screen. The NOL trend reflects a patient's pain-response (nociceptive) state by identifying physiological patterns that are activated by painful stimulation and insufficient analgesia. Thus, NOL monitoring helps clinicians to maintain optimal analgesia, whilst avoiding over medication. NOL provides multiple benefits, including smoother procedures, better patient outcomes and cost savings.³

NOL technology has been validated and found superior to existing pain indicators in peer-reviewed

publications.^{4,5} A recent study⁶ found that monitoring pain response levels during surgery with NOL can help reduce postoperative pain by 33%. Furthermore, patients stress hormone levels (ACTH and cortisol), reported as % of baseline, were up to 50% lower in the NOL-guided group, both during and after surgery. This provides objective validation that titrating analgesia through NOL monitoring improves pain-control.

Other evidence⁷ showed that NOL-guided opioid administration was associated with a 30% reduction in intraoperative opioids usage (remifentanyl) and 80% fewer hypotensive events. Considering the evidence that intraoperative hypotension increases the risk of myocardial injury, acute kidney injury and mortality, this study demonstrates the potential of NOL to reduce the probability of postoperative complications.

Take home message:

- NOL helps reduce both over dosing and under dosing of analgesics
- NOL may help confirm the effectiveness of multi modal analgesia approaches, and regional blocks.
- NOL may help patients benefit from a smoother recovery from surgery with improved outcomes.

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3. Cost benefit of personalizing intraoperative pain management. Saunders R., Weissbrod R. ISPOR Virtual Conference, May 2020
4. Preliminary intraoperative validation of the NOL (Nociception Level) Index, a non-invasive nociception monitor. Ruth Edry, Daniel I.Sessler, et al. *Anesthesiology* July 2016, Vol.125, 193-203
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