

NOL[®] Technology

Fast Facts



The clinical challenge

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 myocardial injury, acute kidney 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.



The NOL solution

NOL (nociception level index) monitoring guides clinicians to maintain optimal analgesia, whilst avoiding over medication. NOL provides multiple benefits, including smoother procedures, better patient outcomes and cost savings.



Clinical application

NOL technology uses a multiparameter-based sensor platform, and advanced algorithm to continuously monitor ANS functions. NOL reflects a patient's nociceptive state and analgesic effect, helping you to optimize the administration of IV and/or regional analgesics, and to **avoid overdose or underuse of these drugs**.



Proven clinical benefits

NOL technology has been validated and found superior to existing surrogate measures of nociception, such as heart rate and blood pressure.^{1,2}

NOL-guided analgesia leads to a **33%** reduction in pain scores in a fentanyl-sevoflurane regimen, (from 4.8 NRS to 3.2 NRS, $p < 0.01$), **decreasing the number of patients requiring pain rescue medication in the PACU**, and up to **50%** reduction in stress hormones ($P < 0.01$)³

NOL-guided analgesia leads to a **30%** reduction in intraoperative opioid usage and **80%** fewer intraoperative events (remifentanyl-propofol regimen).⁴

Considering the evidence that intraoperative hypotension increases the risk of **acute kidney injury, myocardial injury and mortality**, this study demonstrates the potential of NOL to **reduce the probability of post operative complications**.



Cost savings

Health-economic analysis suggests that implementing NOL-guided intraoperative analgesia would result in cost savings within 1 year.⁵

1. 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
2. Ability of the Nociception Level (NOL), a multiparameter composite of autonomic signals, to detect noxious stimuli during propofol-remifentanyl anesthesia. Chris H. Martini, Albert Dahan, et al. Anesthesiology Sept. 2015; 123:524-534
3. Reduced postoperative pain using Nociception Level-guided fentanyl dosing during sevoflurane anaesthesia: a randomised controlled trial. Meijer, F., Honing, M., Roor, T., Toet, S., Calis, P., Olofsen, E., Martini, C., van Velzen, M., Aarts, L., Niesters, M., Boon, M., Dahan, A. British Journal of Anaesthesia September 2020, In Press. DOI: <https://doi.org/10.1016/j.bja.2020.07.057>
4. Nociception-guided versus Standard Care during Remifentanyl-Propofol Anesthesia: A Randomized Controlled Trial. Fleur Meijer, Albert Dahan et al. Anesthesiology 2019 February
5. Cost benefit of personalizing intraoperative pain management. Saunders R., Weissbrod R. ISPOR Virtual Conference, May 2020