

Publications in Peer-Reviewed Journals

- 1. Nociception-guided versus Standard Care during Remifentanil–Propofol Anesthesia: A Randomized Controlled Trial**
Fleur Meijer, Chris Martini, Suzanne Broens, Martijn Boon, Marieke Niesters, Leon Aarts, Erik Olofsen, Monique van Velzen, Albert Dahan.
[Anesthesiology 2019 February; doi:10.1097/ALN.0000000000002634](#)
- 2. The nociception level index (NOL) response to intubation and incision in patients undergoing video-assisted thoracoscopic surgery (VATS) with and without thoracic epidural analgesia. A pilot study**
Laurent Bollag, Srdjan Jelacic, Carlos Delgado Upegui, Cynthia Wu, Philippe Richebe.
[F1000Research 2018 June; 7:875](#)
- 3. Validation of the PMD100 and its NOL Index to detect nociception at different infusion regimen of remifentanil in patients under general anaesthesia**
Pierre-André Stöckle, Marco Julien, Rami Issa, Elizabeth Décary, Véronique Brulotte, Pierre Drolet, Margaret Henri, Madeleine Poirier, Jean-François Latulippe, Marc Dorais, Olivier Verdonck, Louis-Philippe Fortier, Philippe Richebé.
[Minerva Anesthesiol. 2018 Oct; 84\(10\):1160-1168](#)
- 4. Monitoring the Nociception Level Intraoperatively – An Initial Experiences**
Pether Jildenstål1, Katarina Hallén, Katarina Almskog, Johan Sand and Margareta Warren Stomberg.
[J Anest & Inten Care Med. 2018; 7\(2\):1-5](#)
- 5. Preliminary intraoperative validation of the NOL (Nociception Level) Index, a non-invasive nociception monitor**
Ruth Edry, Vasile Recea, Yuri Dikust, Daniel I. Sessler.
[Anesthesiology July 2016, Vol. 125, 193-203](#)
- 6. Ability of the Nociception Level (NOL), a multiparameter composite of autonomic signals, to detect noxious stimuli during propofol-remifentanil anesthesia**
Chris H. Martini, Martijn Boon, Suzanne J. L. Broens, Evelien F. Hekkelman, Lisanne A. Oudhoff, Anna Willemijn Buddeke, Albert Dahan.
[Anesthesiology Sept. 2015; 123:524-534](#)
- 7. Monitoring the Nociception Level – A Multi-Parameter Approach**
Nir Ben-Israel, Mark Kliger, Galit Zuckerman, Yeshayahu Katz, Ruth Edry.
[Journal of Clinical Monitoring and Computing 2013 Dec.; 27\(6\):659-668](#)
- 8. Differentiating between heat pain intensities: the combined effect of multiple autonomic parameters**
Treister Roi, Kliger Mark, Zuckerman Galit, Itay Goor Aryeh, Eisenberg Elon.
[PAIN® 2012 Sept.; 153\(9\):1807-14](#)

Posters, Abstracts and Presentations

- 1. Nociception Level (NOL)-guided Analgesia: Influence on Opioid Consumption and Hypotensive Events During Propofol/Remifentanyl Anesthesia**
Albert Dahan, Fleur S. Meijer, Suzanne Broens, Monique van Velzen, Christian Martini.
Awarded as "10 Best of Abstracts: Clinical Science" @ [ASA, San Francisco, USA, October 2018](#)
- 2. Combined Intraoperative Anesthesia & Analgesia Monitoring Impact on Safety & Recovery: CINAAMON Interim Analysis**
Etienne Renaud-Roy, Philippe Richebé, Olivier Verdonck, Manon Choinière, Véronique Brulotte, Louis-Philippe Fortier.
[ASA, San Francisco, USA, October 2018](#)
[CAS Annual Meeting, Montreal, Quebec, Canada, June 2018](#)
- 3. Impact of Intravenous Phenylephrine Bolus on Intraoperative NOL Index Values**
Philippe G.M. Richebe, Véronique Brulotte, Marie-Andrée Coulombe, Etienne Renaud-Roy, Omar Elsemín, Manon Choinière, Pierre Drolet, Louis-Philippe Fortier, Olivier Verdonck.
[ASA, San Francisco, USA, October 2018](#)
- 4. Performance Assessment of the PMD-200 in Subjects Requiring Surgery Under General Anesthesia**
Virginia Horne, Borzoo Farhang, Alexander Friend, Max Breidstein.
[ASA, San Francisco, USA, October 2018](#)
- 5. NOL Index Response After Laryngoscopy Performed with Macintosh Blade Versus Glidescope™ Videolaryngoscope**
Virginie Sbeghen, Jason McDevitt, Olivier Verdonck, Valerie Zaphiratos, Veronique Brulotte, Christian Loubert, Pierre A. Drolet, Louis-Philippe Fortier, Marie-Claude Guertin, Philippe Richebé.
[ASA, San Francisco, USA, October 2018](#)
2018 CAS Annual Meeting, Montreal, Quebec, Canada, June 2018
- 6. Douleur Périopératoire et Délirium. Monitoring de La Nociception : Un nouveau paradigme multiparamétrique (NOL)**
Dr Pierre-André Stöckle.
NOL technology symposia during SFAR, Paris, France, September 2018
- 7. Intraoperative nociception monitoring and postoperative recovery after knee arthroplasty**
Patricia Lavand'homme, Emmanuel Thienpont.
[IASP, Boston, USA, September 2018](#)
- 8. Detection of Pain under General Anesthesia: Performance Assessment of the PMD-200**
Virginia Horne, Alex Friend, Max Breidstein, Borzoo Farhang.
[12th Annual New England Anesthesia Residents Conference \(NEARC\), Boston, Ma, USA, May 2018](#)
- 9. O noua tehnica non-invaziva pentru monitorizarea durerii si optimizarea analgeziei intraoperatorii: indexul NOL**

Serban Bubenek, Ruth Edry.
NOL technology symposia during SRATI congress, Sinaia, Romania, May 2018

10. Nociceptive monitoring during surgery during Mini-symposium: “Monitoring is our future”

Albert Dahan.
Leiden, The Netherlands, March, 2018

11. Missing a Piece? NOL™ (Nociception Level) Technology: Intraoperative Pain Monitoring for Optimizing Analgesia

Ruth Edry, Daniel I. Sessler.
ICISA 2017, Tel Aviv, Israel, Nov. 2017

12. Tailoring analgesia to patients’ needs. The Nociception Level Index (NOL)

Albert Dahan.
3rd Symposium on Anesthesia, Organized by Hospital Da Luz, Lisbon, Portugal, Sept. 2017

13. Comment j’individualise l’analgésie périopératoire

Philippe G. Richebe.
SFAR Congress, Paris, France, Sept. 2017

14. Impact of different remifentanil doses on the nociception level index response to intra-operative noxious stimuli

Etienne Renaud-Roy, Pierre-André Stöckle, Olivier Verdonck, Louis-Philippe Fortier, Philippe Richebé.
[CAS, Niagara Falls, ON, Canada, June 2017](#) (pages 6-7)
Euroanaesthesia, Geneva, Switzerland, May 2017 (page 41)

15. NOL Index performance in patients with beta-blockers

Ruth Edry, Vasile Recea, Yuri Dikust
Euroanaesthesia, Geneva, Switzerland, May 2017 (page 234)

16. Physiologic Indicators for the assessment of acute pain: Recent evidence and new trends

Céline Gélinas.
[Canadian Pain Society, May 2017](#) (p. A36-A37)

17. Developing a Monitor Process Perspective.

Dr. Ruth Edry – oral presentation at the 2016 Annual Meeting of the Israeli Society of Anesthesiology, December 2016

18. Quantified Analgesic Effect of Intraoperative 50% N2O Inhalation by the NOL and ANI Nociception Indices

Philippe G. Richebe, Elizabeth Decary, Rami Issa, Sarah Maximos, Louis-Philippe Fortier, Olivier Verdonck.
[ASA \(American Society of Anesthesiologists\), Chicago, IL, USA, 2016](#)

19. NOL index variation after standardized nociceptive stimulus decreases with higher doses of remifentanil

Marco Julien, Elizabeth Décary, Rami Issa, Olivier Verdonck, Louis-Philippe Fortier,

Philippe Richebé.

EuroAnesthesia – ESA (European Society of Anaesthesiology). London, UK, 2016

20. Ability of the nociception level, a Multiparameter Composite of Autonomic Signals, to detect noxious stimuli during propofol-remifentanyl anesthesia

Chris Martini, Martijn Boon, Albert Dahan.

ASA (American Society of Anesthesiologists), San Diego, USA, Oct. 2015

21. The level of nociception (NOL) in thoracotomy patients with and without epidural analgesia

Laurent Bollag, Srdjan Jelacic, Cynthia Wu, Philippe Richebé.

EFIC Pain Congress, Vienna, Austria, Sept. 2015

22. Validation of nociception monitor – The NOL Index

Ruth Edry, Vasile Recea, Yuri Dikust, Daniel I. Sessler.

EuroAnesthesia – ESA (European Society of Anaesthesiology), Germany, June 2015

(1AP12-6, page 53)

23. Objective assessment of spinal cord stimulation effectiveness on chronic radicular pain

Nir Ben-Israel, Yariv Amos, Noam Racheli, Mark Kliger, Galit Zuckerman, Roi Treister, Elon Eisenberg.

IASP (International Association for the Study of Pain Annual Meeting), Argentina, Oct. 2014

24. Objective measurement of pain levels in patients with radicular pain treated by spinal cord stimulation

Nir Ben-Israel, Yariv Amos, Mark Kliger, Galit Zuckerman, Erica Suzan, Elon Eisenberg.

AAPM (American Academy of Pain Medicine Annual Meeting), AZ, USA, Mar. 2014

25. Detection of noxious stimuli during general anesthesia using the NOL index for nociception level

Edry Ruth, Kliger Mark, Zuckerman Galit, Racheli Noam, Katz Yeshayahu, Ben-Israel Nir.

[*EuroAnesthesia – ESA \(European Society of Anaesthesiology\), Barcelona, Spain, June 2013*](#)

26. Non-linear Multi-Parameter Approach for Evaluation of Nociception Level During General Anesthesia

Ben-Israel Nir, Zuckerman Galit, Kliger Mark, Katz Yeshayahu, Edry Ruth.

[*STA \(Society for Technology in Anesthesia\), Phoenix, AZ, Jan. 2013*](#)

ASA (American Society of Anesthesiologists), Washington DC, Oct. 2012

27. A combination of multiple autonomic parameters, rather than each parameter alone, yields significant differentiation between heat pain intensities

Roi Treister, Mark Kliger, Galit Zuckerman, Itay Goor Aryeh, Elon Eisenberg.

EFIC Pain Conference, Germany, 2011

28. Toward automatic pain monitoring: Method for classification of pain level based on statistical processing of multiple non-invasive physiological measures

Roi Treister, Mark Kliger, Galit Zuckerman, Itay Goor Aryeh, Elon Eisenberg.

IPA Conference, Israel, 2010

Key Citations and Reviews

- 1. Assessing nociception: steps towards intraoperative “full monitoring” – Editorial Review**
Manuel Á. Gómez-Ríos, Alfredo Abad-Gurumeta, José M. Calvo-Vecino
Minerva Anestesiologica 2018 Oct.; 84(10):1123-5
- 2. Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption in Adult Patients in the ICU**
John W Devlin, Yoanna Skrobik, Céline Gélinas, John Needham et al.
[Crit Care Med. 2018 Sep; 46\(9\):e825-e873](#)
- 3. Le monitoring de la douleur peropératoire : actualités et perspectives (Intraoperative pain monitoring: Update and future directions)**
Pierre-André Stöckle, Philippe Richebé
Anesthésie & Réanimation 2018 May; 4(3):204-214
- 4. Next steps in ICU pain research**
Kathleen Puntillo , Céline Gélinas and Gerald Chanques
[Intensive Care Med. 2017 Sep; 43\(9\):1386-1388](#)
- 5. Digital innovations and emerging technologies for enhanced recovery programmes**
Frederic Michard, Tong Joo (TJ) Gan, Henrik Kehlet
[Br J Anaesth 2017; 119\(1\):31-39](#)
- 6. Objective Assessment of Acute Pain**
Helen Laycock, Carsten Bantel.
J Anesth Clin Res 2016, 7:6
- 7. Physiological Signal Processing for Individualized Anti-nociception Management During General Anesthesia: a Review.**
Julien De Jonckheere, Vincent Bonhomme, Mathieu Jeanne, Emmanuel Boselli, Matthias Gruenewald, Regis Logier, Philippe Richebé.
Yearb Med Inform. 2015 Aug 13;10(1):95-101
- 8. Assessing pain objectively: the use of physiological markers**
Rachel Cowen, Maria Stasiowska, Helen Laycock, Carsten Bantel.
Anaesthesia. 2015 July ;70(7):828-47
- 9. Acute psychosocial stress reduces pain modulation capabilities in healthy men**
Geva Nirit, Pruessner Jens, Defrin Ruth.
PAIN® 2014 Nov.;155(11):2418-25
- 10. Multi-parameter autonomic-based pain assessment: More is more?**
Marco L. Loggia, Vitaly Napadow.
PAIN® 2012; 153:1779–1780