

Entropy Reference Article List 2020

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PEER-REVIEWED ARTICLES

- Dinu, A. R., Rogobete, A. F., Popovici, S. E., Bedreag, O. H., Papurica, M., Dumbuleu, C. M., ... Sandesc, D. (2020). Impact of general anesthesia guided by state entropy (SE) and response entropy (RE) on perioperative stability in elective laparoscopic cholecystectomy patients - A prospective observational randomized monocentric study. *Entropy*, 22(3).
- Elgebaly, A., El Mourad, M., & Fathy, S. (2020). The role of entropy monitoring in reducing propofol requirements during open heart surgeries. A prospective randomized study. *Annals of Cardiac Anaesthesia*, 23(3), 272-276.
- Oliveros, H., Ríos, F., Botero-Rosas, D. A., Quiroga, S. C., Cifuentes, F. C., Rodriguez, G. A., & Morales, M. P. (2020). Variability of anesthetic depth in total intravenous anesthesia vs balanced anesthesia using entropy indices: a randomized , crossover , controlled clinical trial. *Colombian Journal of Anesthesiology*, 48(3), 111-117.
- Ravishankar, M., Mathew, D. M., Hemanthkumar, V. R., & Srinivasan, P. (2020). Quantifying influence of epidural analgesia on entropy guided general anaesthesia using sevoflurane - A randomised controlled trial. *Indian Journal of Anaesthesia*, 64(2), 131-137.
- Kim, Y. S., Won, Y. J., Jeong, H., Lim, B. G., Kong, M. H., & Lee, I. O. (2019). A comparison of bispectral index and entropy during sevoflurane anesthesia induction in children with and without diplegic cerebral palsy. *Entropy*, 21(5).
- Mishra, S., Sinha, R., Ray, B. R., Pandey, R. K., Darlong, V., & Punj, J. (2019). Effect of entropy-guided low-flow desflurane anaesthesia on laryngeal mask airway removal time in children undergoing elective ophthalmic surgery - A prospective, randomised, comparative study. *Indian Journal of Anaesthesia*, 63(6), 485-490.
- Nida, M. A., Mousa, W. F., Elgebaly, A. S., & El-Ashry, H. E. (2019). A Comparative Study between Entropy and Clinical Response to Determine the Requirement of Propofol for Induction of General Anesthesia in Geriatric Patients. *The Medical Journal of Cairo University*, 87(June), 2025-2031.
- Oh, S. K., Lim, B. G., Kim, Y. S., Park, S., & Kim, S. S. (2019). Entropy values are closely related to the degree of neuromuscular block during desflurane anesthesia: a case report. *Journal of International Medical Research*, 47(8), 3985-3991.
- Punj, J., Pandey, R., & Darlong, V. (2019). Most hemodynamically stable method for change from high to low anesthesia flow: A randomized controlled trial comparing state entropy, high fresh gas flow for 10 minutes, and 0.8 ratio of end-expired agent concentration to inspired agent concentration. *AANA Journal*, 87(5), 390-394.
- Singh, D. S., & Taank, D. P. (2019). Spectral Entropy for Assessing the Patient Responsiveness During Propofol/Fentanyl Sedation in Day Care Surgeries. *International Journal of Medical and Biomedical Studies*, 3(9), 210-213.
- Vachnadze, D. I., Akselrod, B. A., Guskov, D. A., & Goncharova, A. V. (2019). Anesthesia depth monitoring using alternative placement of entropy sensors: a prospective study. *Journal of Clinical Monitoring and Computing*, 33, 871-876.
- Xing, Y., Xu, D., Xu, Y., Chen, L., Wang, H., & Li, S. (2019). Effects of Neuromuscular Blockages on Entropy Monitoring During Sevoflurane Anesthesia. *Medical Science Monitor*, 25, 8610-8617.
- Epstein, R. H., Maga, J. M., Mahla, M. E., Schwenk, E. S., & Bloom, M. J. (2018). Prevalence of discordant elevations of state entropy and bispectral index in patients at amnestic sevoflurane concentrations: a historical cohort study. *Canadian Journal of Anesthesia*, 65(5), 512-521.
- Kannan, S., Surhone, N. S., Kumar, R. C., Kavitha, B., Rani, D. D., & Rao, R. S. R. (2018). Effects of bilateral superficial cervical plexus block of sevoflurane consumption during thyroid surgery under entropy-guided general anesthesia: a prospective randomized trial. *Korean Journal of Anesthesiology*, 71(2), 141-148.
- Kim, Y. S., Chung, D., Oh, S. K., Won, Y. J., & Lee, I. O. (2018). Unusual elevation in Entropy but not in PSI during general anesthesia: A case report. *BMC Anesthesiology*, 18(1), 1-5.
- Tiefenthaler, W., Colvin, J., Steger, B., Pfeiffer, K. P., Moser, P. L., Walde, J., ... Kolbitsch, C. (2018). How bispectral index compares to spectral entropy of the EEG and A-line ARX index in the same patient. *Open Medicine (Poland)*, 13(1), 583-596.
- Xinyan, Z., Zhengbang, H., Xuekang, Z., Qian, H., Qiong, W., Sisi, L., ... Zhiyi, L. (2018). Effects of dexmedetomidine, propofol and etomidate on the intraoperative wake-up in the cerebral functional area under the guidance of entropy index. *Pharmazie*, 73(11), 647-650.

Ann, J., Jung, S. M., & Park, S. J. (2017). Decrease in spectral entropy by low tidal volume ventilation-associated severe hypercapnia: A case report. *Korean Journal of Anesthesiology*, 70(2), 213-216.

Goyal, K., Nileshwar, A., Budania, L., Gaude, Y., Mathew, S., & Vaidya, S. (2017). Evaluation of effect of entropy monitoring on isoflurane consumption and recovery from anesthesia. *Journal of Anaesthesia Clinical Pharmacology*, 33(4), 529-533.

Han, S. S., Han, S., Kim, B. G., Kim, D. H., & Ryu, J. H. (2017). The concentration of desflurane preventing spectral entropy change during surgical stimulation: A prospective randomized trial. *Journal of Clinical Anesthesia*, 37, 86-91.

Müller, J. N., Kreuzer, M., García, P. S., Schneider, G., & Hautmann, H. (2017). Monitoring depth of sedation: Evaluating the agreement between the Bispectral Index, qCON and the Entropy Module's State Entropy during flexible bronchoscopy. *Minerva Anestesiologica*, 83(6), 563-573.

Musialowicz, T., Valtola, A., Hippeläinen, M., Halonen, J., & Lahtinen, P. (2017). Spectral entropy parameters during rapid ventricular pacing for transcatheter aortic valve implantation. *Entropy*, 19(3).

Sciusco, A., Standing, J. F., Sheng, Y., Raimondo, P., Cinnella, G., & Dambrosio, M. (2017). Effect of age on the performance of bispectral and entropy indices during sevoflurane pediatric anesthesia: a pharmacometric study. *Pediatric Anesthesia*, 27(4), 399-408.

Bharne, S., Bidkar, P. U., Badhe, A. S., Parida, S., Ramesh, A. S., & others. (2016). Comparison of intravenous labetalol and bupivacaine scalp block on the hemodynamic and entropy changes following skull pin application: A randomized, open label clinical trial. *Asian Journal of Neurosurgery*, 11(1), 60.

Bhaskara, B., Dayananda, V. P., Kannan, S., Rao, R. S. R., & Ramachandraiah, R. (2016). Effect of breastfeeding on haemodynamics and consumption of propofol and sevoflurane: A state entropy guided comparative study. *Indian Journal of Anaesthesia*, 60(3), 180.

Chhabra, A., Subramaniam, R., Srivastava, A., Prabhakar, H., Kalaivani, M., & Paranjape, S. (2016). Spectral entropy monitoring for adults and children undergoing general anaesthesia (Review). *Cochrane Database of Systematic Reviews*, (3), 1465-1858.

Jiang, A., Chen, L.-J., Wang, Y.-X., Li, M.-C., & Ding, Y.-B. (2016). The Effects of Different Methods of Anaesthesia for Laparoscopic Radical Gastrectomy with Monitoring of Entropy. *Anticancer Research*, 36(3), 1305-1308.

Mosquera-Dussán, O. L., Cárdenas, A., Botero-Rosas, D. A., Yepes, A., Oliveros, H., Henao, R., & Ríos, F. (2016). Randomized cross-over clinical trial comparing two pharmacokinetic models of propofol using entropy indices. *Colombian Journal of Anesthesiology*, 44(3), 193-200.

Tewari, S., Bhadaria, P., Wadhawan, S., Prasad, S., & Kohli, A. (2016). Entropy vs standard clinical monitoring using total intravenous anesthesia during transvaginal oocyte retrieval in patients for in vitro fertilization. *Journal of Clinical Anesthesia*, 34, 105-112.

Yassen, K., Abdullah, M., Koptan, H., Elshafie, M., & Yehyia, M. (2016). Entropy Monitoring Effect in Hepatic Cirrhotic Patients Undergoing Major Liver Resection on Sevoflurane Consumption and Hemodynamics. A Randomized Controlled Study. *Journal of Anesthesia & Critical Care: Open Access*, 5(3).

Aho, A. J., Kamata, K., Jäntti, V., Kulkas, A., Hagihira, S., Huhtala, H., & Yli-Hankala, A. (2015). Comparison of Bispectral Index and Entropy values with electroencephalogram during surgical anaesthesia with sevoflurane. *British Journal of Anaesthesia*, 115(2), 258-266.

Chakrabarti, D., & Bansal, S. (2015). ECG contamination of EEG signals: effect on entropy. *Journal of Clinical Monitoring and Computing*, 1-4.

Pilge, S., Kreuzer, M., Karatchiviev, V., Kochs, E. F., Malcharek, M., & Schneider, G. (2015). Differences between state entropy and bispectral index during analysis of identical electroencephalogram signals: A comparison with two randomised anaesthetic techniques. *European Journal of Anaesthesiology (EJA)*, 32(5), 354-365.

Puttappa, A., Sheshadri, K., Boylan, J., & Conlon, N. (2015). Large increases in both response and state entropy to awake values antagonized with administration of incremental rocuronium. *British Journal of Anaesthesia*, 115(6), 934-935.

Rao, A. K., Gurajala, I., & Gopinath, R. (2015). Comparison of electroencephalogram entropy versus loss of verbal response to determine the requirement of propofol for induction of general anaesthesia. *Indian Journal of Anaesthesia*, 59(6), 348.

- Shah, S. B., Chowdhury, I., Bhargava, A. K., & Sabbharwal, B. (2015). Comparison of hemodynamic effects of intravenous etomidate versus propofol during induction and intubation using entropy guided hypnosis levels. *Journal of Anaesthesiology, Clinical Pharmacology*, 31(2), 180.
- Sharma, R., Manninen, P., Venkatraghavan, L., & others. (2015). Monitoring the depth of anaesthesia using the new modified entropy sensors during supratentorial craniotomy: Our experience. *Journal of Neuroanaesthesiology and Critical Care*, 2(1), 28.
- Abdelmageed, W. M., & Al Taher, W. M. (2014). Preoperative paracetamol infusion reduces sevoflurane consumption during thyroidectomy under general anesthesia with spectral entropy monitoring. *Egyptian Journal of Anaesthesia*, 30(2), 115-122.
- Harsoor, S. S., Rani, D. D., Lathashree, S., Nethra, S. S., & Sudheesh, K. (2014). Effect of intraoperative Dexmedetomidine infusion on Sevoflurane requirement and blood glucose levels during entropy-guided general anesthesia. *Journal of Anaesthesiology, Clinical Pharmacology*, 30(1), 25.
- Khan, J., Mariappan, R., & Venkatraghavan, L. (2014). Entropy as an indicator of cerebral perfusion in patients with increased intracranial pressure. *Journal of Anaesthesiology, Clinical Pharmacology*, 30(3), 409.
- Lee, J. Y., Choi, S. R., Chung, C. J., Lee, J. H., Park, J. H., & Baik, C. Y. (2014). The effect of spectral entropy monitoring on propofol use and recovery in children. *Anesthesia and Pain Medicine*, 9(2), 138-143.
- Varma, P., Darlong, V., Pandey, R., Garg, R., & others. (2014). Comparison of subarachnoid block with bupivacaine and bupivacaine with fentanyl on entropy and sedation: A prospective randomized double-blind study. *Journal of Anaesthesiology, Clinical Pharmacology*, 30(4), 543.
- Xue, Z. J., Quan, X., Zhao, J., & Huang, Y. G. (2014). [Efficacy of entropy index in monitoring nociceptive stimulus in patients undergoing propofol-remifentanil general anesthesia]. Zhongguo Yi Xue Ke Xue Yuan Xue Bao. *Acta Academiae Medicinae Sinicae*, 36(1), 68-72.
- Aho, A. J., Yli-Hankala, A. M., Lyytikäinen, L.-P., Kamata, K., & Jäntti, V. (2013). Can electromyographic arousal be detected visually on the Datex-Ohmeda S/5™ Anesthesia Monitor? *Acta Anaesthesiologica Scandinavica*, 57(3), 364-372.
- El Hor, T., Van Der Linden, P., De Hert, S., Mélot, C., & Bidgoli, J. (2013). Impact of entropy monitoring on volatile anesthetic uptake. *The Journal of the American Society of Anesthesiologists*, 118(4), 868-873.
- Kim, H., Lim, B. G., & Lee, S. Y. (2013). Transcranial electrical stimulations given for motor-evoked potentials as the cause for elevated bispectral index and entropy during spine surgery. *Journal of Neurosurgical Anesthesiology*, 25(2), 217-219.
- Kim, Y. H., & Choi, W.-J. (2013). Effect of preoperative anxiety on spectral entropy during induction with propofol. *Korean Journal of Anesthesiology*, 65(2), 108-113.
- Patel, C. R., Engineer, S. R., Shah, B. J., Madhu, S., & others. (2013). The effect of dexmedetomidine continuous infusion as an adjuvant to general anesthesia on sevoflurane requirements: a study based on entropy analysis. *Journal of Anaesthesiology Clinical Pharmacology*, 29(3), 318.
- Shepherd, J., Jones, J., Frampton, G. K., Bryant, J., Baxter, L., & Cooper, K. (2013). Clinical effectiveness and cost-effectiveness of depth of anaesthesia monitoring (E-Entropy, Bispectral Index and Narcotrend): A systematic review and economic evaluation. *Health Technology Assessment*, 17(34), 1-264.
- Aho, A. J., Kamata, K., Yli-Hankala, A. M., Lyytikäinen, L.-P., Kulkas, A., & Jäntti, V. (2012). Elevated BIS and Entropy values after sugammadex or neostigmine: an electroencephalographic or electromyographic phenomenon? *Acta Anaesthesiologica Scandinavica*, 56(4), 465-473.
- Aimé, I., Gayat, E., Fermanian, C., Cook, F., Peuch, C., Laloë, P. A., ... Fischler, M. (2012). Effect of age on the comparability of bispectral and state entropy indices during the maintenance of propofol--sufentanil anaesthesia. *British Journal of Anaesthesia*, aer457.
- Bajwa, S. J. S., Lalitha, K., Dhar, P., Kumar, V., & others. (2012). Influence of esmolol on requirement of inhalational agent using entropy and assessment of its effect on immediate postoperative pain score. *Indian Journal of Anaesthesia*, 56(6), 535.
- Gao, J. D., Zhao, Y. J., Xu, C. S., Zhao, J., Huang, Y. G., Wang, T. L., ... others. (2012). Evaluation of entropy for monitoring the depth of anesthesia compared with bispectral index: a multicenter clinical trial. *Chinese Medical Journal*, 125(8), 1389-1392.

- Ghodki, P. S., Thombre, S. K., Sardesai, S. P., Harnagle, K. D., & others. (2012). Dexmedetomidine as an anesthetic adjuvant in laparoscopic surgery: An observational study using entropy monitoring. *Journal of Anaesthesiology Clinical Pharmacology*, 28(3), 334.
- Guerrero, J. L., Matute, E., Alsina, E., Del Blanco, B., & Gilsanz, F. (2012). Response entropy changes after noxious stimulus. *Journal of Clinical Monitoring and Computing*, 26(3), 171-175.
- Khosravi, S., Hahn, J.-O., Dumont, G. A., & Ansermino, J. M. (2012). A monitor-decoupled pharmacodynamic model of propofol in children using state entropy as clinical endpoint. *IEEE Transactions on Biomedical Engineering*, 59(3), 736-743.
- Kim, H.-M., Shin, S.-W., Yoon, J.-Y., Lee, H.-J., Kim, K.-H., & Baik, S.-W. (2012). Effects of etomidate on bispectral index scale and spectral entropy during induction of anesthesia by means of the raw electroencephalographic and electromyographic characteristics. *Korean Journal of Anesthesiology*, 62(3), 230-233.
- Klockars, J. G. M., Hiller, A., Münte, S., van Gils, M. J., & Taivainen, T. (2012). Spectral entropy as a measure of hypnosis and hypnotic drug effect of total intravenous anesthesia in children during slow induction and maintenance. *The Journal of the American Society of Anesthesiologists*, 116(2), 340-351.
- Kreuzer, M., Zanner, R., Pilge, S., Paprotny, S., Kochs, E. F., & Schneider, G. (2012). Time delay of monitors of the hypnotic component of anesthesia: analysis of state entropy and index of consciousness. *Anesthesia & Analgesia*, 115(2), 315-319.
- Kwon, M.-Y., Lee, S.-Y., Kim, T.-Y., Kim, D. K., Lee, K.-M., Woo, N.-S., ... Lee, M. (2012). Spectral entropy for assessing the depth of propofol sedation. *Korean Journal of Anesthesiology*, 62(3), 234-239.
- Liu, N., Le Guen, M., Benabbes-Lambert, F., Chazot, T., Trillat, B., Sessler, D. I., & Fischler, M. (2012). Feasibility of closed-loop titration of propofol and remifentanil guided by the spectral M-Entropy monitor. *The Journal of the American Society of Anesthesiologists*, 116(2), 286-295.
- Mowafi, H. A. (2012). Spectral entropy as an objective measure of sedation state in midazolam-premedicated patients. *Saudi Journal of Anaesthesia*, 6(2), 131.
- Paisansathan, C., Ozcan, M. D., Khan, Q. S., Baughman, V. L., & Ozcan, M. S. (2012). Signal persistence of bispectral index and state entropy during surgical procedure under sedation. *The Scientific World Journal*, 2012.
- Shalbaf, R., Behnam, H., Sleigh, J., & Voss, L. (2012). Measuring the effects of sevoflurane on electroencephalogram using sample entropy. *Acta Anaesthesiologica Scandinavica*, 56(7), 880-889.
- Aho, A. J., Lyytikäinen, L.-P., Yli-Hankala, A., Kamata, K., & Jäntti, V. (2011). Explaining Entropy responses after a noxious stimulus, with or without neuromuscular blocking agents, by means of the raw electroencephalographic and electromyographic characteristics. *British Journal of Anaesthesia*, 106(1), 69-76.
- Hahn, J.-O., Khosravi, S., Dumont, G. A., & Ansermino, J. M. (2011). Two-stage vs mixed-effect approach to pharmacodynamic modeling of propofol in children using state entropy. *Pediatric Anesthesia*, 21(6), 691-698.
- Kaskinoro, K., Maksimow, A., Långsjö, J. W., Aantaa, R., Jääskeläinen, S. K., Kaisti, K., ... Scheinin, H. (2011). Wide inter-individual variability of bispectral index and spectral entropy at loss of consciousness during increasing concentrations of dexmedetomidine, propofol, and sevoflurane. *British Journal of Anaesthesia*, 107(4), 573-580.
- Musialowicz, T., Lahtinen, P., Pitkänen, O., Kurola, J., & Parviainen, I. (2011). Comparison of Spectral Entropy and BIS VISTA™ monitor during general anesthesia for cardiac surgery. *Journal of Clinical Monitoring and Computing*, 25(2), 95-103.
- Peeters, E. (2011). Automated EEG entropy measurements in coma, vegetative state/unresponsive wakefulness syndrome and minimally conscious state. *Functional Neurology*, 26(1), 25.
- Yen, Y.-H., Lin, T.-F., Lin, C.-J., Lee, Y.-C., Lau, H.-P., & Yeh, H.-M. (2011). Sex differences in conscious sedation during upper gastrointestinal panendoscopic examination. *Journal of the Formosan Medical Association*, 110(1), 44-49.
- Arutiunian, O. M., & Iavorovskiy. (2010). Role of entropy-based neuromonitoring during cardiac surgery. *Anesteziol Reanimatol*, 5, 78-82.
- Baulig, W., Seifert, B., Schmid, E. R., & Schwarz, U. (2010). Comparison of spectral entropy and bispectral index electroencephalography in coronary artery bypass graft surgery. *Journal of Cardiothoracic and Vascular Anesthesia*, 24(4), 544-549.

Choi, S. R., Lim, Y. H., Lee, S. C., Lee, J. H., & Chung, C. J. (2010). Spectral entropy monitoring allowed lower sevoflurane concentration and faster recovery in children. *Acta Anaesthesiologica Scandinavica*, 54(7), 859-862.

Höcker, J., Raitschew, B., Meybohm, P., Broch, O., Stapelfeldt, C., Gruenewald, M., ... Bein, B. (2010). Differences between bispectral index and spectral entropy during xenon anaesthesia: a comparison with propofol anaesthesia. *Anaesthesia*, 65(6), 595-600.

Li, D., Li, X., Liang, Z., Voss, L. J., & Sleigh, J. W. (2010). Multiscale permutation entropy analysis of EEG recordings during sevoflurane anesthesia. *Journal of Neural Engineering*, 7(4), 46010.

Meybohm, P., Gruenewald, M., Höcker, J., Renner, J., GRAESNER, J.-T., Ilies, C., ... Bein, B. (2010). Correlation and agreement between the bispectral index vs. state entropy during hypothermic cardio-pulmonary bypass. *Acta Anaesthesiologica Scandinavica*, 54(2), 169-175.

Ozcan, M. S., Ozcan, M. D., Khan, Q. S., Thompson, D. M., & Chetty, P. K. (2010). Does nitrous oxide affect bispectral index and state entropy when added to a propofol versus sevoflurane anesthetic? *Journal of Neurosurgical Anesthesiology*, 22(4), 309-315.

Smith, F. J., Spijkerman, S., Becker, P. J., & Coetze, J. F. (2010). Entropy of the electroencephalogram as applied in the M-Entropy S/5™ Module (GE Healthcare) during increases in nitrous oxide and constant sevoflurane concentrations. *Southern African Journal of Anaesthesia and Analgesia*, 16(4).

Talawar, P., Chhabra, A., Trikha, A., Arora, M. K., & others. (2010). Entropy monitoring decreases isoflurane concentration and recovery time in pediatric day care surgery-a randomized controlled trial. *Pediatric Anesthesia*, 20(12), 1105-1110.

Aho, A. J., Yli-Hankala, A., Lytykäinen, L.-P., & Jäntti, V. (2009). Facial muscle activity, Response Entropy, and State Entropy indices during noxious stimuli in propofol--nitrous oxide or propofol--nitrous oxide--remifentanil anaesthesia without neuromuscular block. *British Journal of Anaesthesia*, 102(2), 227-233.

Balci, C., Karabekir, H. S., Kahraman, F., & Sivaci, R. G. (2009). Comparison of entropy and bispectral index during propofol and fentanyl sedation in monitored anaesthesia care. *Journal of International Medical Research*, 37(5), 1336-1342.

Haenggi, M., Ypparila-Wolters, H., Buerki, S., Schlauri, R., Korhonen, I., Takala, J., & Jakob, S. M. (2009). Auditory event-related potentials, bispectral index, and entropy for the discrimination of different levels of sedation in intensive care unit patients. *Anesthesia & Analgesia*, 109(3), 807-816.

Haenggi, M., Ypparila-Wolters, H., Hauser, K., Caviezel, C., Takala, J., Korhonen, I., & Jakob, S. M. (2009). Intra-and inter-individual variation of BIS-index and Entropy during controlled sedation with midazolam/remifentanil and dexmedetomidine/remifentanil in healthy volunteers: an interventional study. *Crit Care*, 13(1), R20.

Ikeda, T., Yamada, S., Imada, T., Matsuda, H., & Kazama, T. (2009). Influence of hypobaric hypoxia on bispectral index and spectral entropy in volunteers. *Acta Anaesthesiologica Scandinavica*, 53(7), 891-894.

Kawaguchi, M., Takamatsu, I., & Kazama, T. (2009). Rocuronium dose-dependently suppresses the spectral entropy response to tracheal intubation during propofol anaesthesia. *British Journal of Anaesthesia*, 102(5), 667-672.

Lysakowski, C., Elia, N., Czarnetzki, C., Dumont, L., Haller, G., Combescure, C., & Tramèr, M. R. (2009). Bispectral and spectral entropy indices at propofol-induced loss of consciousness in young and elderly patients. *British Journal of Anaesthesia*, aep162.

Prabhakar, H., Ali, Z., Bithal, P. K., Rath, G. P., Singh, D., & Dash, H. H. (2009). Isoflurane and sevoflurane decrease entropy indices more than halothane at equal MAC values. *Journal of Anesthesia*, 23(1), 154-157.

Prabhakar, H., Ali, Z., Bithal, P. K., Singh, G. P., Laithangbam, P. K., & Dash, H. H. (2009). EEG entropy values during isoflurane, sevoflurane and halothane anesthesia with and without nitrous oxide. *Journal of Neurosurgical Anesthesiology*, 21(2), 108-111.

Wennervirta, J. E., Ermes, M. J., Tiainen, S. M., Salmi, T. K., Hynninen, M. S., Särkelä, M. O. K., ... others. (2009). Hypothermia-treated cardiac arrest patients with good neurological outcome differ early in quantitative variables of EEG suppression and epileptiform activity*. *Critical Care Medicine*, 37(8), 2427-2435.

Haenggi, M., Ypparila-Wolters, H., Bieri, C., Steiner, C., Takala, J., Korhonen, I., & Jakob, S. M. (2008). Entropy and bispectral index for assessment of sedation, analgesia and the effects of unpleasant stimuli in critically ill patients: an observational study. *Critical Care*, 12(5), R119.

- Jagia, M., Prabhakar, H., & Dash, H. (2008). Comparative Evaluation of Spectral Entropy and Bispectral Index during Propofol/Thiopentone Anaesthesia in Patients with Supratentorial Tumours-A Preliminary Study. *Indian Journal of Anesthesia*, 52(2), 175.
- Kawaguchi, M., Takamatsu, I., Masui, K., & Kazama, T. (2008). Effect of landiolol on bispectral index and spectral entropy responses to tracheal intubation during propofol anaesthesia. *British Journal of Anaesthesia*, 101(2), 273-278.
- Laitio, R. M., Kaskinoro, K., Särkelä, M. O. K., Kaisti, K. K., Salmi, E., Maksimow, A., ... others. (2008). Bispectral index, entropy, and quantitative electroencephalogram during single-agent xenon anesthesia. *The Journal of the American Society of Anesthesiologists*, 108(1), 63-70.
- Mahon, P., Greene, B. R., Greene, C., Boylan, G. B., & Shorten, G. D. (2008). Behaviour of spectral entropy, spectral edge frequency 90%, and alpha and beta power parameters during low-dose propofol infusion. *British Journal of Anaesthesia*, 101(2), 213-221.
- Mahon, P., Greene, B. R., Lynch, E. M., McNamara, B., & Shorten, G. D. (2008). Can state or response entropy be used as a measure of sleep depth? *Anaesthesia*, 63(12), 1309-1313.
- Mahon, P., Kowalski, R. G., Fitzgerald, A. P., Lynch, E. M., Boylan, G. B., McNamara, B., & Shorten, G. D. (2008). Spectral entropy as a monitor of depth of propofol induced sedation. *Journal of Clinical Monitoring and Computing*, 22(2), 87-93.
- Moller, D. H., & Rampil, I. J. (2008). Spectral entropy predicts auditory recall in volunteers. *Anesthesia & Analgesia*, 106(3), 873-879.
- Nishiyama, T. (2008). The effects of auditory evoked potential click sounds on bispectral index and entropy. *Anesthesia & Analgesia*, 107(2), 545-548.
- Reviron, P., Lenfant, F., Seltzer, S., Binnert, M., & Freysz, M. (2008). [Interest of entropy monitoring during low-grade cerebral aneurysm embolisation]. In *Annales francaises d'anesthesie et de reanimation* (Vol. 27, pp. 106-107).
- Schultz, A., Siedenberg, M., Grouven, U., Kneif, T., & Schultz, B. (2008). Comparison of Narcotrend Index, Bispectral Index, spectral and entropy parameters during induction of propofol-remifentanil anaesthesia. *Journal of Clinical Monitoring and Computing*, 22(2), 103-111.
- Strandberg, L., & Korhonen, J. (2008). Electroencephalogram-based indexes indicate the drug effect of the brain, not the (un) consciousness itself. *Anesthesia & Analgesia*, 106(5), 1585-1586.
- Walsh, T. S., Ramsay, P., Lapinlampi, T. P., Särkelä, M. O. K., Vieriö-Oja, H. E., & Meriläinen, P. T. (2008). An assessment of the validity of spectral entropy as a measure of sedation state in mechanically ventilated critically ill patients. *Intensive Care Medicine*, 34(2), 308-315.
- Weil, G., Passot, S., Servin, F., & Billard, V. (2008). Does spectral entropy reflect the response to intubation or incision during propofol-remifentanil anesthesia? *Anesthesia & Analgesia*, 106(1), 152-159.
- Wu, S.-C., Wang, P.-C., Liao, W.-T., Shih, T.-H., Chang, K.-A., Lin, K.-C., & Chou, A.-K. (2008). Use of spectral entropy monitoring in reducing the quantity of sevoflurane as sole inhalational anesthetic and in decreasing the need for antihypertensive drugs in total knee replacement surgery. *Acta Anaesthesiologica Taiwanica*, 46(3), 106-111.
- Yli-Hankala, A. (2008). Awareness despite low spectral entropy values. *Anesthesia & Analgesia*, 106(5), 1585.
- Arnold, G., Kluger, M., Voss, L., & Sleigh, J. (2007). BIS and Entropy in the elderly. *Anaesthesia*, 62(9), 907-912.
- Barnard, J. P., Bennett, C., Voss, L. J., & Sleigh, J. W. (2007). Can anaesthetists be taught to interpret the effects of general anaesthesia on the electroencephalogram? Comparison of performance with the BIS and spectral entropy. *British Journal of Anaesthesia*, 99(4), 532-537.
- Davidson, A. J. (2007). Monitoring the anaesthetic depth in children--an update. *Current Opinion in Anesthesiology*, 20(3), 236-243.
- Enlund, M., & Jansson, P. (2007). A comparison of auditory evoked potentials and spectral EEG in the ability to detect marked sevoflurane concentration alterations and clinical events. *Upsala Journal of Medical Sciences*, 112(2), 221-229.
- Ferenets, R., Vanluchene, A., Lipping, T., Heyse, B., & Struys, M. M. R. F. (2007). Behavior of Entropy/Complexity Measures of the Electroencephalogram during Propofol-induced SedationDose-dependent Effects of Remifentanil. *The Journal of the American Society of Anesthesiologists*, 106(4), 696-706.

Gjerstad, A. C., Storm, H., Hagen, R., Huiku, M., Qvigstad, E., & Raeder, J. (2007). Skin conductance or entropy for detection of non-noxious stimulation during different clinical levels of sedation. *Acta Anaesthesiologica Scandinavica*, 51(1), 1-7.

Gjerstad, A. C., Storm, H., Hagen, R., Huiku, M., Qvigstad, E., & Raeder, J. (2007). Comparison of skin conductance with entropy during intubation, tetanic stimulation and emergence from general anaesthesia. *Acta Anaesthesiologica Scandinavica*, 51(1), 8-15.

Gruenewald, M., Zhou, J., Schloemerkemper, N., Meybohm, P., Weiler, N., Tonner, P. H., ... Bein, B. (2007). M-Entropy guidance vs standard practice during propofol-remifentanil anaesthesia: a randomised controlled trial*. *Anaesthesia*, 62(12), 1224-1229.

Hernández-Gancedo, C., Pestana, D., Pérez-Chrzanowska, H., Martínez-Casanova, E., & Criado, A. (2007). Comparing Entropy and the Bispectral index with the Ramsay score in sedated ICU patients. *Journal of Clinical Monitoring and Computing*, 21(5), 295-302.

Kokki, H., Wennervirta, J., Laisalmi, M., & Vakkuri, A. (2007). Regular tramadol use does not affect the propofol dose requirement for induction of anaesthesia. *European Journal of Anaesthesiology*, 24(09), 776-781.

Lefoll-Masson, C., Fermanian, C., Aimé, I., Verroust, N., Taylor, G., Laloë, P.-A., ... Fischler, M. (2007). The comparability of bispectral index and state entropy index during maintenance of sufentanil-sevoflurane-nitrous oxide anesthesia. *Anesthesia & Analgesia*, 105(5), 1319-1325.

Lehmann, A., Schmidt, M., Zeitler, C., Kiessling, A.-H., Isgrø, F., & Boldt, J. (2007). Bispectral index and electroencephalographic entropy in patients undergoing aortocoronary bypass grafting. *European Journal of Anaesthesiology*, 24(09), 751-760.

Maksimow, A., Snipir, A., Särkelä, M., Kentala, E., Koskenvuo, J., Posti, J., ... Scheinin, H. (2007). Assessing the depth of dexmedetomidine-induced sedation with electroencephalogram (EEG)-based spectral entropy. *Acta Anaesthesiologica Scandinavica*, 51(1), 22-30.

Martorano, P., Facco, E., Falzetti, G., & Pelaia, P. (2007). Spectral entropy assessment with auditory evoked potential in neuroanesthesia. *Clinical Neurophysiology*, 118(3), 505-512.

Mathews, D. M., Cirullo, P. M., Struys, M., De Smet, T., Malik, R. J., Chang, C. L., & Neuman, G. G. (2007). Feasibility study for the administration of remifentanil based on the difference between response entropy and state entropy†. *British Journal of Anaesthesia*, 98(6), 785-791.

Riad, W., Schreiber, M., & Saeed, A. B. (2007). Monitoring with EEG entropy decreases propofol requirement and maintains cardiovascular stability during induction of anaesthesia in elderly patients. *European Journal of Anaesthesiology*, 24(08), 684-688.

Struys, M., Vanpeteghem, C., Huiku, M., Uutela, K., Blyaert, N. B. K., & Mortier, E. P. (2007). Changes in a surgical stress index in response to standardized pain stimuli during propofol-remifentanil infusion. *British Journal of Anaesthesia*, 99(3), 359-367.

Vassiliadis, M., Geros, D., & Maria, K. (2007). Awareness despite low spectral entropy values. *Anesthesia & Analgesia*, 105(2), 535.

Wennervirta, J., Salmi, T., Hynynen, M., Yli-Hankala, A., Koivusalo, A.-M., Van Gils, M., ... Vakkuri, A. (2007). Entropy is more resistant to artifacts than bispectral index in brain-dead organ donors. *Intensive Care Medicine*, 33(1), 133-136.

Aimé, I., Verroust, N., Masson-Lefoll, C., Taylor, G., Lalo??, P. A., Liu, N., & Fischler, M. (2006). Does monitoring bispectral index or spectral entropy reduce sevoflurane use? *Anesthesia and Analgesia*, 103(6), 1469-1477.

Bein, B. (2006). Entropy. *Best Practice & Research Clinical Anaesthesiology*, 20(1), 101-109.

Bonhomme, V., Deflandre, E., & Hans, P. (2006). Correlation and agreement between bispectral index and state entropy of the electroencephalogram during propofol anaesthesia. *British Journal of Anaesthesia*, 97(3), 340-346.

Bruhn, J., Myles, P. S., Sneyd, R., & Struys, M. (2006). Depth of anaesthesia monitoring: what's available, what's validated and what's next? *British Journal of Anaesthesia*, 97(1), 85-94.

Davidson, A. J. (2006). Measuring anesthesia in children using the EEG. *Pediatric Anesthesia*, 16(4), 374-387.

Duncan, D., Kelly, K. P., & Andrews, P. J. D. (2006). A comparison of bispectral index and entropy monitoring, in patients undergoing embolization of cerebral artery aneurysms after subarachnoid haemorrhage. *British Journal of Anaesthesia*, 96(5), 590-596.

Ellerkmann, R. K., Soehle, M., Alves, T. M., Liermann, V.-M., Wenningmann, I., Roepcke, H., ... Bruhn, J. (2006). Spectral entropy and bispectral index as measures of the electroencephalographic effects of propofol. *Anesthesia & Analgesia*, 102(5), 1456-1462.

- Feld, J., & Hoffman, W. E. (2006). Response entropy is more reactive than bispectral index during laparoscopic gastric banding. *Journal of Clinical Monitoring and Computing*, 20(4), 229-234.
- Hadzidiakos, D., Nowak, A., Laudahn, N., Baars, J., Herold, K., & Rehberg, B. (2006). Subjective assessment of depth of anaesthesia by experienced and inexperienced anaesthetists. *European Journal of Anaesthesiology*, 23(04), 292-299.
- Hans, P., Giwer, J., Brichant, J.-F., Dewandre, P.-Y., & Bonhomme, V. (2006). Effect of an intubation dose of rocuronium on Spectral Entropy and Bispectral Index™ responses to laryngoscopy during propofol anaesthesia. *British Journal of Anaesthesia*, 97(6), 842-847.
- Klockars, J. G. M., Hiller, A., Ranta, S., Talja, P., van Gils, M. J., & Taivainen, T. (2006). Spectral entropy as a measure of hypnosis in children. *The Journal of the American Society of Anesthesiologists*, 104(4), 708-717.
- Maksimow, A., Särkelä, M. O. K., Långsjö, J. W., Salmi, E., Kaisti, K. K., Yli-Hankala, A. M., ... Jääskeläinen, S. K. (2006). Increase in high frequency EEG activity explains the poor performance of EEG spectral entropy monitor during S-ketamine anesthesia. *Clinical Neurophysiology*, 117(8), 1660-1668.
- Martorano, P. P., Falzetti, G., & Pelaia, P. (2006). Bispectral index and spectral entropy in neuroanesthesia. *Journal of Neurosurgical Anesthesiology*, 18(3), 205-210.
- McKay, I. D. H., Voss, L. J., Sleigh, J. W., Barnard, J. P., & Johannsen, E. K. (2006). Pharmacokinetic-pharmacodynamic modeling the hypnotic effect of sevoflurane using the spectral entropy of the electroencephalogram. *Anesthesia & Analgesia*, 102(1), 91-97.
- Rantanen, M., Yli-Hankala, A., Van Gils, M., Yppärilä-Wolters, H., Takala, P., Huiku, M., ... Korhonen, I. (2006). Novel multiparameter approach for measurement of nociception at skin incision during general anaesthesia. *British Journal of Anaesthesia*, 96(3), 367-376.
- Rinaldi, S., Consales, G., & De Gaudio, A. R. (2006). State entropy and bispectral index: correlation with end tidal sevoflurane concentrations. *Minerva Anestesiologica*, 73(1-2), 39-48.
- Soto, R. G., Smith, R. A., Zaccaria, A. L., & Miguel, R. V. (2006). The effect of addition of nitrous oxide to a sevoflurane anesthetic on BIS, PSI, and entropy. *Journal of Clinical Monitoring and Computing*, 20(3), 145-150.
- Takamatsu, I., Ozaki, M., & Kazama, T. (2006). Entropy indices vs the bispectral index™ for estimating nociception during sevoflurane anaesthesia. *British Journal of Anaesthesia*, 96(5), 620-626.
- Valjus, M., Ahonen, J., Jokela, R., & Korttila, K. (2006). Response Entropy™ is not more sensitive than State Entropy™ in distinguishing the use of esmolol instead of remifentanil in patients undergoing gynaecological laparoscopy. *Acta Anaesthesiologica Scandinavica*, 50(1), 32-39.
- Vereecke, H. E. M., Vanluchene, A. L., Mortier, E. P., Everaert, K., & Struys, M. M. R. F. (2006). The effects of ketamine and rocuronium on the A-Line{®} auditory evoked potential Index, Bispectral Index, and spectral entropy monitor during steady state propofol and remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 105(6), 1122-1134.
- White, P. F., Tang, J., Romero, G. F., Wender, R. H., Naruse, R., Sloninsky, A., & Kariger, R. (2006). A comparison of state and response entropy versus bispectral index values during the perioperative period. *Anesthesia & Analgesia*, 102(1), 160-167.
- Baughman, V. L., Hoffman, W. E., Koenig, H. M., Wheeler, P. L., Ananda, R. C., & Wang, M. (2005). Recovery from paralysis with succinylcholine increased Response entropy and EMG but not State entropy. *Journal of Clinical Monitoring and Computing*, 19(3), 201-205.
- Davidson, A. J., Huang, G. H., Rebmann, C. S., & Ellery, C. (2005). Performance of entropy and Bispectral Index as measures of anaesthesia effect in children of different ages. *British Journal of Anaesthesia*, 95(5), 674-679.
- Hans, P., Dewandre, P.-Y., Brichant, J.-F., & Bonhomme, V. (2005). Effects of nitrous oxide on spectral entropy of the EEG during surgery under balanced anaesthesia with sufentanil and sevoflurane. *Acta Anaesthesiol Belg*, 56(1), 37-43.
- Hans, P., Dewandre, P.-Y., Brichant, J.-F., & Bonhomme, V. (2005). Comparative effects of ketamine on Bispectral Index and spectral entropy of the electroencephalogram under sevoflurane anaesthesia. *British Journal of Anaesthesia*, 94(3), 336-340.
- Iannuzzi, M., Iannuzzi, E., Rossi, F., Berrino, L., & Chiefari, M. (2005). Relationship between bispectral index, electroencephalographic state entropy and effect-site EC50 for propofol at different clinical endpoints. *British Journal of Anaesthesia*, 94(4), 492-495.

Liu, N., Chazot, T., Huybrechts, I., Law-Koune, J.-D., Barvais, L., & Fischler, M. (2005). The influence of a muscle relaxant bolus on bispectral and datex-ohmeda entropy values during propofol-remifentanil induced loss of consciousness. *Anesthesia & Analgesia*, 101(6), 1713-1718.

Maksimow, A., Kaisti, K., Aalto, S., Mäenpää, M., Jääskeläinen, S., Hinkka, S., ... Scheinin, H. (2005). Correlation of EEG spectral entropy with regional cerebral blood flow during sevoflurane and propofol anaesthesia*. *Anaesthesia*, 60(9), 862-869.

Seitsonen, E. R. J., Korhonen, I. K. J., Van Gils, M. J., Huiku, M., Lötjönen, J. M. P., Korttila, K. T., & Yli-Hankala, A. M. (2005). EEG spectral entropy, heart rate, photoplethysmography and motor responses to skin incision during sevoflurane anaesthesia. *Acta Anaesthesiologica Scandinavica*, 49(3), 284-292.

Soto, R., Nguyen, T. C., & Smith, R. A. (2005). A comparison of bispectral index and entropy, or how to misinterpret both. *Anesthesia & Analgesia*, 100(4), 1059-1061.

Vakkuri, A., Yli-Hankala, A., Sandin, R., Mustola, S., Høymark, S., Nyblom, S., ... Vieriö-Oja, H. (2005). Spectral entropy monitoring is associated with reduced propofol use and faster emergence in propofol--nitrous oxide--alfentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 103(2), 274-279.

Wheeler, P., Hoffman, W. E., Baughman, V. L., & Koenig, H. (2005). Response entropy increases during painful stimulation. *Journal of Neurosurgical Anesthesiology*, 17(2), 86-90.

Anderson, R. E., & Jakobsson, J. G. (2004). Entropy of EEG during anaesthetic induction: a comparative study with propofol or nitrous oxide as sole agent†. *British Journal of Anaesthesia*, 92(2), 167-170.

Anderson, R. E., Barr, G., Öwall, A., & Jakobsson, J. (2004). Entropy during propofol hypnosis, including an episode of wakefulness. *Anaesthesia*, 59(1), 52-56.

Chazot, T., Liu, N., Trémelot, L., Joukovsky, P., & Fischler, M. (2004). Detection of gas embolism by bispectral index and entropy monitoring in two cases. *The Journal of the American Society of Anesthesiologists*, 101(4), 1053-1054.

Davidson, A. J., Kim, M. J., & Sangolt, G. K. (2004). Entropy and bispectral index during anaesthesia in children. *Anaesthesia and Intensive Care*, 32(4), 485.

Ellerkmann, R. K., Liermann, V.-M., Alves, T. M., Wenningmann, I., Kreuer, S., Wilhelm, W., ... Bruhn, J. (2004). Spectral entropy and bispectral index as measures of the electroencephalographic effects of sevoflurane. *The Journal of the American Society of Anesthesiologists*, 101(6), 1275-1282.

Kotur, P. F. (2004). Editorial: Entropy - A new measure of anaesthetic depth. *Indian Journal of Anaesthesia*, 48(3), 170-171.

Nunes, R. R. (2004). Entropy: A new method of measuring depth of anesthesia. Comparative study with bispectral index during clinical evaluation in tracheal intubation of patients anesthetized with sevoflurane. *Revista Brasileira de Anestesiologia*, 54(3), 289-302.

Nunes, R. R., Almeida, M. P. de, & Sleigh, J. W. (2004). Spectral entropy: a new method for anesthetic adequacy. *Revista Brasileira de Anestesiologia*, 54(3), 404-422.

Schmidt, G. N., Bischoff, P., Standl, T., Hellstern, A., Teuber, O., & am Esch, J. S. (2004). Comparative evaluation of the Datex-Ohmeda S/5 Entropy Module and the Bispectral Index® monitor during propofol--remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 101(6), 1283-1290.

Sleigh, J. W., & Barnard, J. P. M. (2004). Editorial | Entropy is blind to nitrous oxide. Can we see why? *British Journal of Anaesthesia*, 92(2), 159-161.

Vakkuri, A., Yli-Hankala, A., Talja, P., Mustola, S., Tolvanen-Laakso, H., Sampson, T., & Vieriö-Oja, H. (2004). Time-frequency balanced spectral entropy as a measure of anesthetic drug effect in central nervous system during sevoflurane, propofol, and thiopental anesthesia. *Acta Anaesthesiologica Scandinavica*, 48(2), 145-153.

Vanluchene, A. L. G., Struys, M., Heyse, B. E. K., & Mortier, E. P. (2004). Spectral entropy measurement of patient responsiveness during propofol and remifentanil. A comparison with the bispectral index. *British Journal of Anaesthesia*, 93(5), 645-654.

- Vanluchene, A. L. G., Vereecke, H., Thas, O., Mortier, E. P., Shafer, S. L., & Struys, M. M. R. F. (2004). Spectral Entropy as an Electroencephalographic Measure of Anesthetic Drug EffectA Comparison with Bispectral Index and Processed Midlatency Auditory Evoked Response. *The Journal of the American Society of Anesthesiologists*, 101(1), 34-42.
- Viertiö-Oja, H., Maja, V., Särkelä, M., Talja, P., Tenkanen, N., Tolvanen-Laakso, H., ... Meriläinen, P. (2004). Description of the Entropy algorithm as applied in the Datex-Ohmeda S/5 Entropy Module. *Acta Anaesthesiologica Scandinavica*, 48(2), 154-161.
- Särkelä, M. O. K., Mustola, S., Seppänen, T., Koskinen, M., Lepola, P., Suominen, K., ... Jäntti, V. H. (2002). Automatic analysis and monitoring of burst suppression in anesthesia. *Journal of Clinical Monitoring and Computing*, 17(2), 125-134.

PEER-REVIEWED ARTICLES LISTED BY CATEGORIES

Bypass surgery

- Elgebaly, A., El Mourad, M., & Fathy, S. (2020). The role of entropy monitoring in reducing propofol requirements during open heart surgeries. A prospective randomized study. *Annals of Cardiac Anaesthesia*, 23(3), 272-276.
- Baulig, W., Seifert, B., Schmid, E. R., & Schwarz, U. (2010). Comparison of spectral entropy and bispectral index electroencephalography in coronary artery bypass graft surgery. *Journal of Cardiothoracic and Vascular Anesthesia*, 24(4), 544-549.
- Meybohm, P., Gruenewald, M., Höcker, J., Renner, J., GRAESNER, J.-T., Ilies, C., ... Bein, B. (2010). Correlation and agreement between the bispectral index vs. state entropy during hypothermic cardio-pulmonary bypass. *Acta Anaesthesiologica Scandinavica*, 54(2), 169-175.
- Lehmann, A., Schmidt, M., Zeitler, C., Kiessling, A.-H., Isgro, F., & Boldt, J. (2007). Bispectral index and electroencephalographic entropy in patients undergoing aortocoronary bypass grafting. *European Journal of Anaesthesiology*, 24(09), 751-760.

Cardiac surgery

- Vachnadze, D. I., Akselrod, B. A., Guskov, D. A., & Goncharova, A. V. (2019). Anesthesia depth monitoring using alternative placement of entropy sensors: a prospective study. *Journal of Clinical Monitoring and Computing*, 33, 871-876.
- Musialowicz, T., Valtola, A., Hippeläinen, M., Halonen, J., & Lahtinen, P. (2017). Spectral entropy parameters during rapid ventricular pacing for transcatheter aortic valve implantation. *Entropy*, 19(3).
- Musialowicz, T., Lahtinen, P., Pitkänen, O., Kurola, J., & Parviainen, I. (2011). Comparison of Spectral Entropy and BIS VISTA™ monitor during general anesthesia for cardiac surgery. *Journal of Clinical Monitoring and Computing*, 25(2), 95-103.
- Arutiunian, O. M., & Iavorovskii. (2010). Role of entropy-based neuromonitoring during cardiac surgery. *Anesteziol Reanimatol*, 5, 78-82.

Critical care

- Peeters, E. (2011). Automated EEG entropy measurements in coma, vegetative state/unresponsive wakefulness syndrome and minimally conscious state. *Functional Neurology*, 26(1), 25.
- Haenggi, M., Ypparila-Wolters, H., Buerki, S., Schlauri, R., Korhonen, I., Takala, J., & Jakob, S. M. (2009). Auditory event-related potentials, bispectral index, and entropy for the discrimination of different levels of sedation in intensive care unit patients. *Anesthesia & Analgesia*, 109(3), 807-816.
- Wennervirta, J. E., Ermes, M. J., Tiainen, S. M., Salmi, T. K., Hynninen, M. S., Särkelä, M. O. K., ... others. (2009). Hypothermia-treated cardiac arrest patients with good neurological outcome differ early in quantitative variables of EEG suppression and epileptiform activity*. *Critical Care Medicine*, 37(8), 2427-2435.
- Haenggi, M., Ypparila-Wolters, H., Bieri, C., Steiner, C., Takala, J., Korhonen, I., & Jakob, S. M. (2008). Entropy and bispectral index for assessment of sedation, analgesia and the effects of unpleasant stimuli in critically ill patients: an observational study. *Critical Care*, 12(5), R119.
- Walsh, T. S., Ramsay, P., Lapinlampi, T. P., Särkelä, M. O. K., Viertiö-Oja, H. E., & Meriläinen, P. T. (2008). An assessment of the validity of spectral entropy as a measure of sedation state in mechanically ventilated critically ill patients. *Intensive Care Medicine*, 34(2), 308-315.
- Hernández-Gancedo, C., Pestana, D., Pérez-Chrzanowska, H., Martínez-Casanova, E., & Criado, A. (2007). Comparing Entropy and the Bispectral index with the Ramsay score in sedated ICU patients. *Journal of Clinical Monitoring and Computing*, 21(5), 295-302.

Desflurane

- Mishra, S., Sinha, R., Ray, B. R., Pandey, R. K., Darlong, V., & Punj, J. (2019). Effect of entropy-guided low-flow desflurane anaesthesia on laryngeal mask airway removal time in children undergoing elective ophthalmic surgery - A prospective, randomised, comparative study. *Indian Journal of Anaesthesia*, 63(6), 485-490.

Oh, S. K., Lim, B. G., Kim, Y. S., Park, S., & Kim, S. S. (2019). Entropy values are closely related to the degree of neuromuscular block during desflurane anesthesia: a case report. *Journal of International Medical Research*, 47(8), 3985-3991.

Han, S. S., Han, S., Kim, B. G., Kim, D. H., & Ryu, J. H. (2017). The concentration of desflurane preventing spectral entropy change during surgical stimulation: A prospective randomized trial. *Journal of Clinical Anesthesia*, 37, 86-91.

White, P. F., Tang, J., Romero, G. F., Wender, R. H., Naruse, R., Sloninsky, A., & Kariger, R. (2006). A comparison of state and response entropy versus bispectral index values during the perioperative period. *Anesthesia & Analgesia*, 102(1), 160-167.

Vakkuri, A., Yli-Hankala, A., Talja, P., Mustola, S., Tolvanen-Laakso, H., Sampson, T., & Viertiö-Oja, H. (2004). Time-frequency balanced spectral entropy as a measure of anesthetic drug effect in central nervous system during sevoflurane, propofol, and thiopental anesthesia. *Acta Anaesthesiologica Scandinavica*, 48(2), 145-153.

Dexmedetomidine

Xinyan, Z., Zhengbang, H., Xuekang, Z., Qian, H., Qiong, W., Sisi, L., ... Zhiyi, L. (2018). Effects of dexmedetomidine, propofol and etomidate on the intraoperative wake-up in the cerebral functional area under the guidance of entropy index. *Pharmazie*, 73(11), 647-650.

Harsoor, S. S., Rani, D. D., Lathashree, S., Nethra, S. S., & Sudheesh, K. (2014). Effect of intraoperative Dexmedetomidine infusion on Sevoflurane requirement and blood glucose levels during entropy-guided general anesthesia. *Journal of Anaesthesiology, Clinical Pharmacology*, 30(1), 25.

Patel, C. R., Engineer, S. R., Shah, B. J., Madhu, S., & others. (2013). The effect of dexmedetomidine continuous infusion as an adjuvant to general anesthesia on sevoflurane requirements: a study based on entropy analysis. *Journal of Anaesthesiology Clinical Pharmacology*, 29(3), 318.

Ghodki, P. S., Thombre, S. K., Sardesai, S. P., Harnagle, K. D., & others. (2012). Dexmedetomidine as an anesthetic adjuvant in laparoscopic surgery: An observational study using entropy monitoring. *Journal of Anaesthesiology Clinical Pharmacology*, 28(3), 334.

Kaskinoro, K., Maksimow, A., Långsjö, J. W., Aantaa, R., Jääskeläinen, S. K., Kaisti, K., ... Scheinin, H. (2011). Wide inter-individual variability of bispectral index and spectral entropy at loss of consciousness during increasing concentrations of dexmedetomidine, propofol, and sevoflurane. *British Journal of Anaesthesia*, 107(4), 573-580.

Haenggi, M., Ypparila-Wolters, H., Hauser, K., Caviezel, C., Takala, J., Korhonen, I., & Jakob, S. M. (2009). Intra-and inter-individual variation of BIS-index and Entropy during controlled sedation with midazolam/remifentanil and dexmedetomidine/remifentanil in healthy volunteers: an interventional study. *Crit Care*, 13(1), R20.

Maksimow, A., Snipir, A., Särkelä, M., Kentala, E., Koskenvuo, J., Posti, J., ... Scheinin, H. (2007). Assessing the depth of dexmedetomidine-induced sedation with electroencephalogram (EEG)-based spectral entropy. *Acta Anaesthesiologica Scandinavica*, 51(1), 22-30.

Elderly patient

Nida, M. A., Mousa, W. F., Elgebaly, A. S., & El-Ashry, H. E. (2019). A Comparative Study between Entropy and Clinical Response to Determine the Requirement of Propofol for Induction of General Anesthesia in Geriatric Patients. *The Medical Journal of Cairo University*, 87(June), 2025-2031.

Aimé, I., Gayat, E., Fermanian, C., Cook, F., Peuch, C., Laloë, P. A., ... Fischler, M. (2012). Effect of age on the comparability of bispectral and state entropy indices during the maintenance of propofol--sufentanil anaesthesia. *British Journal of Anaesthesia*, aer457.

Lysakowski, C., Elia, N., Czarnetzki, C., Dumont, L., Haller, G., Combescure, C., & Tramèr, M. R. (2009). Bispectral and spectral entropy indices at propofol-induced loss of consciousness in young and elderly patients. *British Journal of Anaesthesia*, aep162.

Arnold, G., Kluger, M., Voss, L., & Sleigh, J. (2007). BIS and Entropy in the elderly. *Anaesthesia*, 62(9), 907-912.

Riad, W., Schreiber, M., & Saeed, A. B. (2007). Monitoring with EEG entropy decreases propofol requirement and maintains cardiovascular stability during induction of anaesthesia in elderly patients. *European Journal of Anaesthesiology*, 24(08), 684-688.

Etomidate

Xinyan, Z., Zhengbang, H., Xuekang, Z., Qian, H., Qiong, W., Sisi, L., ... Zhiyi, L. (2018). Effects of dexmedetomidine, propofol and etomidate on the intraoperative wake-up in the cerebral functional area under the guidance of entropy index. *Pharmazie*, 73(11), 647-650.

Shah, S. B., Chowdhury, I., Bhargava, A. K., & Sabbharwal, B. (2015). Comparison of hemodynamic effects of intravenous etomidate versus propofol during induction and intubation using entropy guided hypnosis levels. *Journal of Anaesthesiology, Clinical Pharmacology*, 31(2), 180.

Kim, H.-M., Shin, S.-W., Yoon, J.-Y., Lee, H.-J., Kim, K.-H., & Baik, S.-W. (2012). Effects of etomidate on bispectral index scale and spectral entropy during induction of anesthesia by means of the raw electroencephalographic and electromyographic characteristics. *Korean Journal of Anesthesiology*, 62(3), 230-233.

Halothane

Prabhakar, H., Ali, Z., Bithal, P. K., Rath, G. P., Singh, D., & Dash, H. H. (2009). Isoflurane and sevoflurane decrease entropy indices more than halothane at equal MAC values. *Journal of Anesthesia*, 23(1), 154-157.

Prabhakar, H., Ali, Z., Bithal, P. K., Singh, G. P., Laithangbam, P. K., & Dash, H. H. (2009). EEG entropy values during isoflurane, sevoflurane and halothane anesthesia with and without nitrous oxide. *Journal of Neurosurgical Anesthesiology*, 21(2), 108-111.

Isoflurane

Punj, J., Pandey, R., & Darlong, V. (2019). Most hemodynamically stable method for change from high to low anesthesia flow: A randomized controlled trial comparing state entropy, high fresh gas flow for 10 minutes, and 0.8 ratio of end-expired agent concentration to inspired agent concentration. *AANA Journal*, 87(5), 390-394.

Goyal, K., Nileshwar, A., Budania, L., Gaude, Y., Mathew, S., & Vaidya, S. (2017). Evaluation of effect of entropy monitoring on isoflurane consumption and recovery from anesthesia. *Journal of Anaesthesiology Clinical Pharmacology*, 33(4), 529-533.

Talawar, P., Chhabra, A., Trikha, A., Arora, M. K., & others. (2010). Entropy monitoring decreases isoflurane concentration and recovery time in pediatric day care surgery-a randomized controlled trial. *Pediatric Anesthesia*, 20(12), 1105-1110.

Prabhakar, H., Ali, Z., Bithal, P. K., Rath, G. P., Singh, D., & Dash, H. H. (2009). Isoflurane and sevoflurane decrease entropy indices more than halothane at equal MAC values. *Journal of Anesthesia*, 23(1), 154-157.

Prabhakar, H., Ali, Z., Bithal, P. K., Singh, G. P., Laithangbam, P. K., & Dash, H. H. (2009). EEG entropy values during isoflurane, sevoflurane and halothane anesthesia with and without nitrous oxide. *Journal of Neurosurgical Anesthesiology*, 21(2), 108-111.

Ketamine

Maksimow, A., Särkelä, M. O. K., Långsjö, J. W., Salmi, E., Kaisti, K. K., Yli-Hankala, A. M., ... Jääskeläinen, S. K. (2006). Increase in high frequency EEG activity explains the poor performance of EEG spectral entropy monitor during S-ketamine anesthesia. *Clinical Neurophysiology*, 117(8), 1660-1668.

Vereecke, H. E. M., Vanluchene, A. L., Mortier, E. P., Everaert, K., & Struys, M. M. R. F. (2006). The effects of ketamine and rocuronium on the A-Line® auditory evoked potential Index, Bispectral Index, and spectral entropy monitor during steady state propofol and remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 105(6), 1122-1134.

Hans, P., Dewandre, P.-Y., Brichant, J.-F., & Bonhomme, V. (2005). Comparative effects of ketamine on Bispectral Index and spectral entropy of the electroencephalogram under sevoflurane anaesthesia. *British Journal of Anaesthesia*, 94(3), 336-340.

Midazolam

Mowafi, H. A. (2012). Spectral entropy as an objective measure of sedation state in midazolam-premedicated patients. *Saudi Journal of Anaesthesia*, 6(2), 131.

Haenggi, M., Ypparila-Wolters, H., Hauser, K., Caviezel, C., Takala, J., Korhonen, I., & Jakob, S. M. (2009). Intra-and inter-individual variation of BIS-index and Entropy during controlled sedation with midazolam/remifentanil and dexmedetomidine/remifentanil in healthy volunteers: an interventional study. *Crit Care*, 13(1), R20.

Neuroanesthesia

- Bharne, S., Bidkar, P. U., Badhe, A. S., Parida, S., Ramesh, A. S., & others. (2016). Comparison of intravenous labetalol and bupivacaine scalp block on the hemodynamic and entropy changes following skull pin application: A randomized, open label clinical trial. *Asian Journal of Neurosurgery*, 11(1), 60.
- Sharma, R., Manninen, P., Venkatraghavan, L., & others. (2015). Monitoring the depth of anaesthesia using the new modified entropy sensors during supratentorial craniotomy: Our experience. *Journal of Neuroanaesthesiology and Critical Care*, 2(1), 28.
- Khan, J., Mariappan, R., & Venkatraghavan, L. (2014). Entropy as an indicator of cerebral perfusion in patients with increased intracranial pressure. *Journal of Anaesthesiology, Clinical Pharmacology*, 30(3), 409.
- Kim, H., Lim, B. G., & Lee, S. Y. (2013). Transcranial electrical stimulations given for motor-evoked potentials as the cause for elevated bispectral index and entropy during spine surgery. *Journal of Neurosurgical Anesthesiology*, 25(2), 217-219.
- Jagia, M., Prabhakar, H., & Dash, H. (2008). Comparative Evaluation of Spectral Entropy and Bispectral Index during Propofol/ Thiopentone Anaesthesia in Patients with Supratentorial Tumours-A Preliminary Study. *Indian Journal of Anesthesia*, 52(2), 175.
- Reviron, P., Lenfant, F., Seltzer, S., Binnert, M., & Freysz, M. (2008). [Interest of entropy monitoring during low-grade cerebral aneurysm embolisation]. In *Annales francaises d'anesthesie et de reanimation* (Vol. 27, pp. 106-107).
- Martorano, P., Facco, E., Falzetti, G., & Pelaia, P. (2007). Spectral entropy assessment with auditory evoked potential in neuroanesthesia. *Clinical Neurophysiology*, 118(3), 505-512.
- Duncan, D., Kelly, K. P., & Andrews, P. J. D. (2006). A comparison of bispectral index and entropy monitoring, in patients undergoing embolization of cerebral artery aneurysms after subarachnoid haemorrhage. *British Journal of Anaesthesia*, 96(5), 590-596.
- Martorano, P. P., Falzetti, G., & Pelaia, P. (2006). Bispectral index and spectral entropy in neuroanesthesia. *Journal of Neurosurgical Anesthesiology*, 18(3), 205-210.

Neuromuscular blocking agents

- Oh, S. K., Lim, B. G., Kim, Y. S., Park, S., & Kim, S. S. (2019). Entropy values are closely related to the degree of neuromuscular block during desflurane anesthesia: a case report. *Journal of International Medical Research*, 47(8), 3985-3991.
- Xing, Y., Xu, D., Xu, Y., Chen, L., Wang, H., & Li, S. (2019). Effects of Neuromuscular Blockages on Entropy Monitoring During Sevoflurane Anesthesia. *Medical Science Monitor*, 25, 8610-8617.
- Puttappa, A., Sheshadri, K., Boylan, J., & Conlon, N. (2015). Large increases in both response and state entropy to awake values antagonized with administration of incremental rocuronium. *British Journal of Anaesthesia*, 115(6), 934-935.
- Aho, A. J., Kamata, K., Yli-Hankala, A. M., Lyytikäinen, L.-P., Kulkas, A., & Jäntti, V. (2012). Elevated BIS and Entropy values after sugammadex or neostigmine: an electroencephalographic or electromyographic phenomenon? *Acta Anaesthesiologica Scandinavica*, 56(4), 465-473.
- Aho, A. J., Lyytikäinen, L.-P., Yli-Hankala, A., Kamata, K., & Jäntti, V. (2011). Explaining Entropy responses after a noxious stimulus, with or without neuromuscular blocking agents, by means of the raw electroencephalographic and electromyographic characteristics. *British Journal of Anaesthesia*, 106(1), 69-76.
- Aho, A. J., Yli-Hankala, A., Lyytikäinen, L.-P., & Jäntti, V. (2009). Facial muscle activity, Response Entropy, and State Entropy indices during noxious stimuli in propofol--nitrous oxide or propofol--nitrous oxide--remifentanil anaesthesia without neuromuscular block. *British Journal of Anaesthesia*, 102(2), 227-233.
- Kawaguchi, M., Takamatsu, I., & Kazama, T. (2009). Rocuronium dose-dependently suppresses the spectral entropy response to tracheal intubation during propofol anaesthesia. *British Journal of Anaesthesia*, 102(5), 667-672.
- Hans, P., Giwer, J., Brichant, J.-F., Dewandre, P.-Y., & Bonhomme, V. (2006). Effect of an intubation dose of rocuronium on Spectral Entropy and Bispectral Index™ responses to laryngoscopy during propofol anaesthesia. *British Journal of Anaesthesia*, 97(6), 842-847.
- Vereecke, H. E. M., Vanluchene, A. L., Mortier, E. P., Everaert, K., & Struys, M. M. R. F. (2006). The effects of ketamine and rocuronium on the A-Line{®} auditory evoked potential Index, Bispectral Index, and spectral entropy monitor during steady state propofol and remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 105(6), 1122-1134.

Baughman, V. L., Hoffman, W. E., Koenig, H. M., Wheeler, P. L., Ananda, R. C., & Wang, M. (2005). Recovery from paralysis with succinylcholine increased Response entropy and EMG but not State entropy. *Journal of Clinical Monitoring and Computing*, 19(3), 201-205.

Liu, N., Chazot, T., Huybrechts, I., Law-Koune, J.-D., Barvais, L., & Fischler, M. (2005). The influence of a muscle relaxant bolus on bispectral and datex-ohmeda entropy values during propofol-remifentanil induced loss of consciousness. *Anesthesia & Analgesia*, 101(6), 1713-1718.

Nitrous oxide

Ozcan, M. S., Ozcan, M. D., Khan, Q. S., Thompson, D. M., & Chetty, P. K. (2010). Does nitrous oxide affect bispectral index and state entropy when added to a propofol versus sevoflurane anesthetic? *Journal of Neurosurgical Anesthesiology*, 22(4), 309-315.

Smith, F. J., Spijkerman, S., Becker, P. J., & Coetzee, J. F. (2010). Entropy of the electroencephalogram as applied in the M-Entropy S/5™ Module (GE Healthcare) during increases in nitrous oxide and constant sevoflurane concentrations. *Southern African Journal of Anaesthesia and Analgesia*, 16(4).

Aho, A. J., Yli-Hankala, A., Lyytikäinen, L.-P., & Jäntti, V. (2009). Facial muscle activity, Response Entropy, and State Entropy indices during noxious stimuli in propofol--nitrous oxide or propofol--nitrous oxide--remifentanil anaesthesia without neuromuscular block. *British Journal of Anaesthesia*, 102(2), 227-233.

Prabhakar, H., Ali, Z., Bithal, P. K., Singh, G. P., Laithangbam, P. K., & Dash, H. H. (2009). EEG entropy values during isoflurane, sevoflurane and halothane anesthesia with and without nitrous oxide. *Journal of Neurosurgical Anesthesiology*, 21(2), 108-111.

Lefoll-Masson, C., Fermanian, C., Aimé, I., Verroust, N., Taylor, G., Laloë, P.-A., ... Fischler, M. (2007). The comparability of bispectral index and state entropy index during maintenance of sufentanil-sevoflurane-nitrous oxide anesthesia. *Anesthesia & Analgesia*, 105(5), 1319-1325.

Soto, R. G., Smith, R. A., Zaccaria, A. L., & Miguel, R. V. (2006). The effect of addition of nitrous oxide to a sevoflurane anesthetic on BIS, PSI, and entropy. *Journal of Clinical Monitoring and Computing*, 20(3), 145-150.

Hans, P., Dewandre, P.-Y., Brichant, J.-F., & Bonhomme, V. (2005). Effects of nitrous oxide on spectral entropy of the EEG during surgery under balanced anaesthesia with sufentanil and sevoflurane. *Acta Anaesthesiol Belg*, 56(1), 37-43.

Vakkuri, A., Yli-Hankala, A., Sandin, R., Mustola, S., Høymork, S., Nyblom, S., ... Viertiö-Oja, H. (2005). Spectral entropy monitoring is associated with reduced propofol use and faster emergence in propofol--nitrous oxide--alfentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 103(2), 274-279.

Anderson, R. E., & Jakobsson, J. G. (2004). Entropy of EEG during anaesthetic induction: a comparative study with propofol or nitrous oxide as sole agent†. *British Journal of Anaesthesia*, 92(2), 167-170.

Sleigh, J. W., & Barnard, J. P. M. (2004). Editorial | Entropy is blind to nitrous oxide. Can we see why? *British Journal of Anaesthesia*, 92(2), 159-161.

Nociceptive stimulus

Xue, Z. J., Quan, X., Zhao, J., & Huang, Y. G. (2014). [Efficacy of entropy index in monitoring nociceptive stimulus in patients undergoing propofol-remifentanil general anesthesia]. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao. Acta Academiae Medicinae Sinicae*, 36(1), 68-72.

Guerrero, J. L., Matute, E., Alsina, E., Del Blanco, B., & Gilsanz, F. (2012). Response entropy changes after noxious stimulus. *Journal of Clinical Monitoring and Computing*, 26(3), 171-175.

Aho, A. J., Lyytikäinen, L.-P., Yli-Hankala, A., Kamata, K., & Jäntti, V. (2011). Explaining Entropy responses after a noxious stimulus, with or without neuromuscular blocking agents, by means of the raw electroencephalographic and electromyographic characteristics. *British Journal of Anaesthesia*, 106(1), 69-76.

Aho, A. J., Yli-Hankala, A., Lyytikäinen, L.-P., & Jäntti, V. (2009). Facial muscle activity, Response Entropy, and State Entropy indices during noxious stimuli in propofol--nitrous oxide or propofol--nitrous oxide--remifentanil anaesthesia without neuromuscular block. *British Journal of Anaesthesia*, 102(2), 227-233.

- Kawaguchi, M., Takamatsu, I., & Kazama, T. (2009). Rocuronium dose-dependently suppresses the spectral entropy response to tracheal intubation during propofol anaesthesia. *British Journal of Anaesthesia*, 102(5), 667-672.
- Kawaguchi, M., Takamatsu, I., Masui, K., & Kazama, T. (2008). Effect of landiolol on bispectral index and spectral entropy responses to tracheal intubation during propofol anaesthesia. *British Journal of Anaesthesia*, 101(2), 273-278.
- Weil, G., Passot, S., Servin, F., & Billard, V. (2008). Does spectral entropy reflect the response to intubation or incision during propofol-remifentanil anesthesia? *Anesthesia & Analgesia*, 106(1), 152-159.
- Gjerstad, A. C., Storm, H., Hagen, R., Huiku, M., Qvigstad, E., & Raeder, J. (2007). Comparison of skin conductance with entropy during intubation, tetanic stimulation and emergence from general anaesthesia. *Acta Anaesthesiologica Scandinavica*, 51(1), 8-15.
- Struys, M., Vanpeteghem, C., Huiku, M., Uutela, K., Blyaert, N. B. K., & Mortier, E. P. (2007). Changes in a surgical stress index in response to standardized pain stimuli during propofol-remifentanil infusion. *British Journal of Anaesthesia*, 99(3), 359-367.
- Hans, P., Giwer, J., Brichant, J.-F., Dewandre, P.-Y., & Bonhomme, V. (2006). Effect of an intubation dose of rocuronium on Spectral Entropy and Bispectral Index™ responses to laryngoscopy during propofol anaesthesia. *British Journal of Anaesthesia*, 97(6), 842-847.
- Rantanen, M., Yli-Hankala, A., Van Gils, M., Yppärilä-Wolters, H., Takala, P., Huiku, M., ... Korhonen, I. (2006). Novel multiparameter approach for measurement of nociception at skin incision during general anaesthesia. *British Journal of Anaesthesia*, 96(3), 367-376.
- Takamatsu, I., Ozaki, M., & Kazama, T. (2006). Entropy indices vs the bispectral index™ for estimating nociception during sevoflurane anaesthesia. *British Journal of Anaesthesia*, 96(5), 620-626.
- Seitsonen, E. R. J., Korhonen, I. K. J., Van Gils, M. J., Huiku, M., Lötzönen, J. M. P., Korttila, K. T., & Yli-Hankala, A. M. (2005). EEG spectral entropy, heart rate, photoplethysmography and motor responses to skin incision during sevoflurane anaesthesia. *Acta Anaesthesiologica Scandinavica*, 49(3), 284-292.
- Wheeler, P., Hoffman, W. E., Baughman, V. L., & Koenig, H. (2005). Response entropy increases during painful stimulation. *Journal of Neurosurgical Anesthesiology*, 17(2), 86-90.
- Nunes, R. R., Almeida, M. P. de, & Sleigh, J. W. (2004). Spectral entropy: a new method for anesthetic adequacy. *Revista Brasileira de Anestesiologia*, 54(3), 404-422.
- ### Opioid
- Singh, D. S., & Taank, D. P. (2019). Spectral Entropy for Assessing the Patient Responsiveness During Propofol/Fentanyl Sedation in Day Care Surgeries. *International Journal of Medical and Biomedical Studies*, 3(9), 210-213.
- Tiefenthaler, W., Colvin, J., Steger, B., Pfeiffer, K. P., Moser, P. L., Walde, J., ... Kolbitsch, C. (2018). How bispectral index compares to spectral entropy of the EEG and A-line ARX index in the same patient. *Open Medicine (Poland)*, 13(1), 583-596.
- Tewari, S., Bhadaria, P., Wadhawan, S., Prasad, S., & Kohli, A. (2016). Entropy vs standard clinical monitoring using total intravenous anesthesia during transvaginal oocyte retrieval in patients for in vitro fertilization. *Journal of Clinical Anesthesia*, 34, 105-112.
- Yassen, K., Abdullah, M., Koptan, H., Elshafie, M., & Yehyia, M. (2016). Entropy Monitoring Effect in Hepatic Cirrhotic Patients Undergoing Major Liver Resection on Sevoflurane Consumption and Hemodynamics. A Randomized Controlled Study. *Journal of Anesthesia & Critical Care: Open Access*, 5(3).
- Varma, P., Darlong, V., Pandey, R., Garg, R., & others. (2014). Comparison of subarachnoid block with bupivacaine and bupivacaine with fentanyl on entropy and sedation: A prospective randomized double-blind study. *Journal of Anaesthesiology, Clinical Pharmacology*, 30(4), 543.
- Xue, Z. J., Quan, X., Zhao, J., & Huang, Y. G. (2014). [Efficacy of entropy index in monitoring nociceptive stimulus in patients undergoing propofol-remifentanil general anesthesia]. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao. Acta Academiae Medicinae Sinicae*, 36(1), 68-72.
- Aimé, I., Gayat, E., Fermanian, C., Cook, F., Peuch, C., Laloë, P. A., ... Fischler, M. (2012). Effect of age on the comparability of bispectral and state entropy indices during the maintenance of propofol-sufentanil anaesthesia. *British Journal of Anaesthesia*, aer457.

Liu, N., Le Guen, M., Benabbes-Lambert, F., Chazot, T., Trillat, B., Sessler, D. I., & Fischler, M. (2012). Feasibility of closed-loop titration of propofol and remifentanil guided by the spectral M-Entropy monitor. *The Journal of the American Society of Anesthesiologists*, 116(2), 286-295.

Aho, A. J., Yli-Hankala, A., Lyytikäinen, L.-P., & Jäntti, V. (2009). Facial muscle activity, Response Entropy, and State Entropy indices during noxious stimuli in propofol--nitrous oxide or propofol--nitrous oxide--remifentanil anaesthesia without neuromuscular block. *British Journal of Anaesthesia*, 102(2), 227-233.

Balci, C., Karabekir, H. S., Kahraman, F., & Sivaci, R. G. (2009). Comparison of entropy and bispectral index during propofol and fentanyl sedation in monitored anaesthesia care. *Journal of International Medical Research*, 37(5), 1336-1342.

Haenggi, M., Ypparila-Wolters, H., Hauser, K., Caviezel, C., Takala, J., Korhonen, I., & Jakob, S. M. (2009). Intra-and inter-individual variation of BIS-index and Entropy during controlled sedation with midazolam/remifentanil and dexmedetomidine/remifentanil in healthy volunteers: an interventional study. *Crit Care*, 13(1), R20.

Schultz, A., Siedenberg, M., Grouven, U., Kneif, T., & Schultz, B. (2008). Comparison of Narcotrend Index, Bispectral Index, spectral and entropy parameters during induction of propofol-remifentanil anaesthesia. *Journal of Clinical Monitoring and Computing*, 22(2), 103-111.

Weil, G., Passot, S., Servin, F., & Billard, V. (2008). Does spectral entropy reflect the response to intubation or incision during propofol-remifentanil anesthesia? *Anesthesia & Analgesia*, 106(1), 152-159.

Gruenewald, M., Zhou, J., Schloemerkemper, N., Meybohm, P., Weiler, N., Tonner, P. H., ... Bein, B. (2007). M-Entropy guidance vs standard practice during propofol-remifentanil anaesthesia: a randomised controlled trial*. *Anaesthesia*, 62(12), 1224-1229.

Kokki, H., Wennervirta, J., Laisalmi, M., & Vakkuri, A. (2007). Regular tramadol use does not affect the propofol dose requirement for induction of anaesthesia. *European Journal of Anaesthesiology*, 24(09), 776-781.

Lefoll-Masson, C., Fermanian, C., Aimé, I., Verroust, N., Taylor, G., Laloë, P.-A., ... Fischler, M. (2007). The comparability of bispectral index and state entropy index during maintenance of sufentanil-sevoflurane-nitrous oxide anesthesia. *Anesthesia & Analgesia*, 105(5), 1319-1325.

Mathews, D. M., Cirullo, P. M., Struys, M., De Smet, T., Malik, R. J., Chang, C. L., & Neuman, G. G. (2007). Feasibility study for the administration of remifentanil based on the difference between response entropy and state entropy†. *British Journal of Anaesthesia*, 98(6), 785-791.

Struys, M., Vanpeteghem, C., Huiku, M., Uutela, K., Blyaert, N. B. K., & Mortier, E. P. (2007). Changes in a surgical stress index in response to standardized pain stimuli during propofol--remifentanil infusion. *British Journal of Anaesthesia*, 99(3), 359-367.

Valjus, M., Ahonen, J., Jokela, R., & Korttila, K. (2006). Response Entropy™ is not more sensitive than State Entropy™ in distinguishing the use of esmolol instead of remifentanil in patients undergoing gynaecological laparoscopy. *Acta Anaesthesiologica Scandinavica*, 50(1), 32-39.

Vereecke, H. E. M., Vanluchene, A. L., Mortier, E. P., Everaert, K., & Struys, M. M. R. F. (2006). The effects of ketamine and rocuronium on the A-Line® auditory evoked potential Index, Bispectral Index, and spectral entropy monitor during steady state propofol and remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 105(6), 1122-1134.

Hans, P., Dewandre, P.-Y., Brichant, J.-F., & Bonhomme, V. (2005). Effects of nitrous oxide on spectral entropy of the EEG during surgery under balanced anaesthesia with sufentanil and sevoflurane. *Acta Anaesthesiol Belg*, 56(1), 37-43.

Liu, N., Chazot, T., Huybrechts, I., Law-Koune, J.-D., Barvais, L., & Fischler, M. (2005). The influence of a muscle relaxant bolus on bispectral and datex-ohmeda entropy values during propofol-remifentanil induced loss of consciousness. *Anesthesia & Analgesia*, 101(6), 1713-1718.

Vakkuri, A., Yli-Hankala, A., Sandin, R., Mustola, S., Høymark, S., Nyblom, S., ... Vertiö-Oja, H. (2005). Spectral entropy monitoring is associated with reduced propofol use and faster emergence in propofol--nitrous oxide--alfentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 103(2), 274-279.

Schmidt, G. N., Bischoff, P., Standl, T., Hellstern, A., Teuber, O., & am Esch, J. S. (2004). Comparative evaluation of the Datex-Ohmeda S/5 Entropy Module and the Bispectral Index® monitor during propofol--remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 101(6), 1283-1290.

Vanluchene, A. L. G., Struys, M., Heyse, B. E. K., & Mortier, E. P. (2004). Spectral entropy measurement of patient responsiveness during propofol and remifentanil. A comparison with the bispectral index. *British Journal of Anaesthesia*, 93(5), 645-654.

Outcome

- Dinu, A. R., Rogobete, A. F., Popovici, S. E., Bedreag, O. H., Papurica, M., Dumbuleu, C. M., ... Sandesc, D. (2020). Impact of general anesthesia guided by state entropy (SE) and response entropy (RE) on perioperative stability in elective laparoscopic cholecystectomy patients - A prospective observational randomized monocentric study. *Entropy*, 22(3).
- Elgebaly, A., El Mourad, M., & Fathy, S. (2020). The role of entropy monitoring in reducing propofol requirements during open heart surgeries. A prospective randomized study. *Annals of Cardiac Anaesthesia*, 23(3), 272-276.
- Mishra, S., Sinha, R., Ray, B. R., Pandey, R. K., Darlong, V., & Punj, J. (2019). Effect of entropy-guided low-flow desflurane anaesthesia on laryngeal mask airway removal time in children undergoing elective ophthalmic surgery - A prospective, randomised, comparative study. *Indian Journal of Anaesthesia*, 63(6), 485-490.
- Nida, M. A., Mousa, W. F., Elgebaly, A. S., & El-Ashry, H. E. (2019). A Comparative Study between Entropy and Clinical Response to Determine the Requirement of Propofol for Induction of General Anesthesia in Geriatric Patients. *The Medical Journal of Cairo University*, 87(June), 2025-2031.
- Punj, J., Pandey, R., & Darlong, V. (2019). Most hemodynamically stable method for change from high to low anesthesia flow: A randomized controlled trial comparing state entropy, high fresh gas flow for 10 minutes, and 0.8 ratio of end-expired agent concentration to inspired agent concentration. *AANA Journal*, 87(5), 390-394.
- Goyal, K., Nileshwar, A., Budania, L., Gaude, Y., Mathew, S., & Vaidya, S. (2017). Evaluation of effect of entropy monitoring on isoflurane consumption and recovery from anesthesia. *Journal of Anaesthesiology Clinical Pharmacology*, 33(4), 529-533.
- Tewari, S., Bhadoria, P., Wadhawan, S., Prasad, S., & Kohli, A. (2016). Entropy vs standard clinical monitoring using total intravenous anesthesia during transvaginal oocyte retrieval in patients for in vitro fertilization. *Journal of Clinical Anesthesia*, 34, 105-112.
- Yassen, K., Abdulla, M., Koptan, H., Elshafie, M., & Yehyia, M. (2016). Entropy Monitoring Effect in Hepatic Cirrhotic Patients Undergoing Major Liver Resection on Sevoflurane Consumption and Hemodynamics. A Randomized Controlled Study. *Journal of Anesthesia & Critical Care: Open Access*, 5(3).
- Lee, J. Y., Choi, S. R., Chung, C. J., Lee, J. H., Park, J. H., & Baik, C. Y. (2014). The effect of spectral entropy monitoring on propofol use and recovery in children. *Anesthesia and Pain Medicine*, 9(2), 138-143.
- El Hor, T., Van Der Linden, P., De Hert, S., Mélot, C., & Bidgoli, J. (2013). Impact of entropy monitoring on volatile anesthetic uptake. *The Journal of the American Society of Anesthesiologists*, 118(4), 868-873.
- Choi, S. R., Lim, Y. H., Lee, S. C., Lee, J. H., & Chung, C. J. (2010). Spectral entropy monitoring allowed lower sevoflurane concentration and faster recovery in children. *Acta Anaesthesiologica Scandinavica*, 54(7), 859-862.
- Talawar, P., Chhabra, A., Trikha, A., Arora, M. K., & others. (2010). Entropy monitoring decreases isoflurane concentration and recovery time in pediatric day care surgery-a randomized controlled trial. *Pediatric Anesthesia*, 20(12), 1105-1110.
- Wu, S.-C., Wang, P.-C., Liao, W.-T., Shih, T.-H., Chang, K.-A., Lin, K.-C., & Chou, A.-K. (2008). Use of spectral entropy monitoring in reducing the quantity of sevoflurane as sole inhalational anesthetic and in decreasing the need for antihypertensive drugs in total knee replacement surgery. *Acta Anaesthesiologica Taiwanica*, 46(3), 106-111.
- Gruenewald, M., Zhou, J., Schloemerkemper, N., Meybohm, P., Weiler, N., Tonner, P. H., ... Bein, B. (2007). M-Entropy guidance vs standard practice during propofol-remifentanil anaesthesia: a randomised controlled trial*. *Anaesthesia*, 62(12), 1224-1229.
- Riad, W., Schreiber, M., & Saeed, A. B. (2007). Monitoring with EEG entropy decreases propofol requirement and maintains cardiovascular stability during induction of anaesthesia in elderly patients. *European Journal of Anaesthesiology*, 24(08), 684-688.
- Aimé, I., Verroust, N., Masson-Lefoll, C., Taylor, G., Lalo??, P. A., Liu, N., & Fischler, M. (2006). Does monitoring bispectral index or spectral entropy reduce sevoflurane use? *Anesthesia and Analgesia*, 103(6), 1469-1477.
- Vakkuri, A., Yli-Hankala, A., Sandin, R., Mustola, S., Höymork, S., Nyblom, S., ... Viertiö-Oja, H. (2005). Spectral entropy monitoring is associated with reduced propofol use and faster emergence in propofol--nitrous oxide--alfentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 103(2), 274-279.

Pediatrics

- Kim, Y. S., Won, Y. J., Jeong, H., Lim, B. G., Kong, M. H., & Lee, I. O. (2019). A comparison of bispectral index and entropy during sevoflurane anesthesia induction in children with and without diplegic cerebral palsy. *Entropy*, 21(5).
- Mishra, S., Sinha, R., Ray, B. R., Pandey, R. K., Darlong, V., & Punj, J. (2019). Effect of entropy-guided low-flow desflurane anaesthesia on laryngeal mask airway removal time in children undergoing elective ophthalmic surgery - A prospective, randomised, comparative study. *Indian Journal of Anaesthesia*, 63(6), 485-490.
- Sciusco, A., Standing, J. F., Sheng, Y., Raimondo, P., Cinnella, G., & Dambrosio, M. (2017). Effect of age on the performance of bispectral and entropy indices during sevoflurane pediatric anesthesia: a pharmacometric study. *Pediatric Anesthesia*, 27(4), 399-408.
- Chhabra, A., Subramaniam, R., Srivastava, A., Prabhakar, H., Kalaivani, M., & Paranjape, S. (2016). Spectral entropy monitoring for adults and children undergoing general anaesthesia (Review). *Cochrane Database of Systematic Reviews*, (3), 1465-1858.
- Lee, J. Y., Choi, S. R., Chung, C. J., Lee, J. H., Park, J. H., & Baik, C. Y. (2014). The effect of spectral entropy monitoring on propofol use and recovery in children. *Anesthesia and Pain Medicine*, 9(2), 138-143.
- Khosravi, S., Hahn, J.-O., Dumont, G. A., & Ansermino, J. M. (2012). A monitor-decoupled pharmacodynamic model of propofol in children using state entropy as clinical endpoint. *IEEE Transactions on Biomedical Engineering*, 59(3), 736-743.
- Klockars, J. G. M., Hiller, A., Münte, S., van Gils, M. J., & Taivainen, T. (2012). Spectral entropy as a measure of hypnosis and hypnotic drug effect of total intravenous anesthesia in children during slow induction and maintenance. *The Journal of the American Society of Anesthesiologists*, 116(2), 340-351.
- Hahn, J.-O., Khosravi, S., Dumont, G. A., & Ansermino, J. M. (2011). Two-stage vs mixed-effect approach to pharmacodynamic modeling of propofol in children using state entropy. *Pediatric Anesthesia*, 21(6), 691-698.
- Choi, S. R., Lim, Y. H., Lee, S. C., Lee, J. H., & Chung, C. J. (2010). Spectral entropy monitoring allowed lower sevoflurane concentration and faster recovery in children. *Acta Anaesthesiologica Scandinavica*, 54(7), 859-862.
- Talawar, P., Chhabra, A., Trikha, A., Arora, M. K., & others. (2010). Entropy monitoring decreases isoflurane concentration and recovery time in pediatric day care surgery-a randomized controlled trial. *Pediatric Anesthesia*, 20(12), 1105-1110.
- Lysakowski, C., Elia, N., Czarnetzki, C., Dumont, L., Haller, G., Combescure, C., & Tramèr, M. R. (2009). Bispectral and spectral entropy indices at propofol-induced loss of consciousness in young and elderly patients. *British Journal of Anaesthesia*, aep162.
- Davidson, A. J. (2007). Monitoring the anaesthetic depth in children--an update. *Current Opinion in Anesthesiology*, 20(3), 236-243.
- Davidson, A. J. (2006). Measuring anesthesia in children using the EEG. *Pediatric Anesthesia*, 16(4), 374-387.
- Klockars, J. G. M., Hiller, A., Ranta, S., Talja, P., van Gils, M. J., & Taivainen, T. (2006). Spectral entropy as a measure of hypnosis in children. *The Journal of the American Society of Anesthesiologists*, 104(4), 708-717.
- Davidson, A. J., Huang, G. H., Rebmann, C. S., & Ellery, C. (2005). Performance of entropy and Bispectral Index as measures of anaesthesia effect in children of different ages. *British Journal of Anaesthesia*, 95(5), 674-679.
- Davidson, A. J., Kim, M. J., & Sangolt, G. K. (2004). Entropy and bispectral index during anaesthesia in children. *Anaesthesia and Intensive Care*, 32(4), 485.

Propofol

- Elgebaly, A., El Mourad, M., & Fathy, S. (2020). The role of entropy monitoring in reducing propofol requirements during open heart surgeries. A prospective randomized study. *Annals of Cardiac Anaesthesia*, 23(3), 272-276.
- Oliveros, H., Ríos, F., Botero-Rosas, D. A., Quiroga, S. C., Cifuentes, F. C., Rodriguez, G. A., & Morales, M. P. (2020). Variability of anesthetic depth in total intravenous anesthesia vs balanced anesthesia using entropy indices: a randomized , crossover , controlled clinical trial. *Colombian Journal of Anesthesiology*, 48(3), 111-117.
- Nida, M. A., Mousa, W. F., Elgebaly, A. S., & El-Ashry, H. E. (2019). A Comparative Study between Entropy and Clinical Response to Determine the Requirement of Propofol for Induction of General Anesthesia in Geriatric Patients. *The Medical Journal of Cairo University*, 87(June), 2025-2031.

Singh, D. S., & Taank, D. P. (2019). Spectral Entropy for Assessing the Patient Responsiveness During Propofol/Fentanyl Sedation in Day Care Surgeries. *International Journal of Medical and Biomedical Studies*, 3(9), 210-213.

Tiefenthaler, W., Colvin, J., Steger, B., Pfeiffer, K. P., Moser, P. L., Walde, J., ... Kolbitsch, C. (2018). How bispectral index compares to spectral entropy of the EEG and A-line ARX index in the same patient. *Open Medicine (Poland)*, 13(1), 583-596.

Xinyan, Z., Zhengbang, H., Xuekang, Z., Qian, H., Qiong, W., Sisi, L., ... Zhiyi, L. (2018). Effects of dexmedetomidine, propofol and etomidate on the intraoperative wake-up in the cerebral functional area under the guidance of entropy index. *Pharmazie*, 73(11), 647-650.

Müller, J. N., Kreuzer, M., García, P. S., Schneider, G., & Hautmann, H. (2017). Monitoring depth of sedation: Evaluating the agreement between the Bispectral Index, qCON and the Entropy Module's State Entropy during flexible bronchoscopy. *Minerva Anestesiologica*, 83(6), 563-573.

Bhaskara, B., Dayananda, V. P., Kannan, S., Rao, R. S. R., & Ramachandraiah, R. (2016). Effect of breastfeeding on haemodynamics and consumption of propofol and sevoflurane: A state entropy guided comparative study. *Indian Journal of Anaesthesia*, 60(3), 180.

Mosquera-Dussán, O. L., Cárdenas, A., Botero-Rosas, D. A., Yepes, A., Oliveros, H., Henao, R., & Ríos, F. (2016). Randomized cross-over clinical trial comparing two pharmacokinetic models of propofol using entropy indices. *Colombian Journal of Anesthesiology*, 44(3), 193-200.

Tewari, S., Bhadaria, P., Wadhawan, S., Prasad, S., & Kohli, A. (2016). Entropy vs standard clinical monitoring using total intravenous anesthesia during transvaginal oocyte retrieval in patients for in vitro fertilization. *Journal of Clinical Anesthesia*, 34, 105-112.

Yassen, K., Abdulla, M., Koptan, H., Elshafie, M., & Yehyia, M. (2016). Entropy Monitoring Effect in Hepatic Cirrhotic Patients Undergoing Major Liver Resection on Sevoflurane Consumption and Hemodynamics. A Randomized Controlled Study. *Journal of Anesthesia & Critical Care: Open Access*, 5(3).

Rao, A. K., Gurajala, I., & Gopinath, R. (2015). Comparison of electroencephalogram entropy versus loss of verbal response to determine the requirement of propofol for induction of general anaesthesia. *Indian Journal of Anaesthesia*, 59(6), 348.

Shah, S. B., Chowdhury, I., Bhargava, A. K., & Sabbharwal, B. (2015). Comparison of hemodynamic effects of intravenous etomidate versus propofol during induction and intubation using entropy guided hypnosis levels. *Journal of Anaesthesiology, Clinical Pharmacology*, 31(2), 180.

Lee, J. Y., Choi, S. R., Chung, C. J., Lee, J. H., Park, J. H., & Baik, C. Y. (2014). The effect of spectral entropy monitoring on propofol use and recovery in children. *Anesthesia and Pain Medicine*, 9(2), 138-143.

Xue, Z. J., Quan, X., Zhao, J., & Huang, Y. G. (2014). [Efficacy of entropy index in monitoring nociceptive stimulus in patients undergoing propofol-remifentanil general anesthesia]. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao. Acta Academiae Medicinae Sinicae*, 36(1), 68-72.

Kim, Y. H., & Choi, W.-J. (2013). Effect of preoperative anxiety on spectral entropy during induction with propofol. *Korean Journal of Anesthesiology*, 65(2), 108-113.

Aimé, I., Gayat, E., Fermanian, C., Cook, F., Peuch, C., Laloë, P. A., ... Fischler, M. (2012). Effect of age on the comparability of bispectral and state entropy indices during the maintenance of propofol--sufentanil anaesthesia. *British Journal of Anaesthesia*, aer457.

Khosravi, S., Hahn, J.-O., Dumont, G. A., & Ansermino, J. M. (2012). A monitor-decoupled pharmacodynamic model of propofol in children using state entropy as clinical endpoint. *IEEE Transactions on Biomedical Engineering*, 59(3), 736-743.

Kwon, M.-Y., Lee, S.-Y., Kim, T.-Y., Kim, D. K., Lee, K.-M., Woo, N.-S., ... Lee, M. (2012). Spectral entropy for assessing the depth of propofol sedation. *Korean Journal of Anesthesiology*, 62(3), 234-239.

Liu, N., Le Guen, M., Benabbes-Lambert, F., Chazot, T., Trillat, B., Sessler, D. I., & Fischler, M. (2012). Feasibility of closed-loop titration of propofol and remifentanil guided by the spectral M-Entropy monitor. *The Journal of the American Society of Anesthesiologists*, 116(2), 286-295.

Kaskinoro, K., Maksimow, A., Långsjö, J. W., Aantaa, R., Jääskeläinen, S. K., Kaisti, K., ... Scheinin, H. (2011). Wide inter-individual variability of bispectral index and spectral entropy at loss of consciousness during increasing concentrations of dexmedetomidine, propofol, and sevoflurane. *British Journal of Anaesthesia*, 107(4), 573-580.

- Höcker, J., Raitschew, B., Meybohm, P., Broch, O., Stapelfeldt, C., Gruenewald, M., ... Bein, B. (2010). Differences between bispectral index and spectral entropy during xenon anaesthesia: a comparison with propofol anaesthesia. *Anaesthesia*, 65(6), 595-600.
- Ozcan, M. S., Ozcan, M. D., Khan, Q. S., Thompson, D. M., & Chetty, P. K. (2010). Does nitrous oxide affect bispectral index and state entropy when added to a propofol versus sevoflurane anesthetic? *Journal of Neurosurgical Anesthesiology*, 22(4), 309-315.
- Aho, A. J., Yli-Hankala, A., Lyytikäinen, L.-P., & Jäntti, V. (2009). Facial muscle activity, Response Entropy, and State Entropy indices during noxious stimuli in propofol--nitrous oxide or propofol--nitrous oxide--remifentanil anaesthesia without neuromuscular block. *British Journal of Anaesthesia*, 102(2), 227-233.
- Balci, C., Karabekir, H. S., Kahraman, F., & Sivaci, R. G. (2009). Comparison of entropy and bispectral index during propofol and fentanyl sedation in monitored anaesthesia care. *Journal of International Medical Research*, 37(5), 1336-1342.
- Lysakowski, C., Elia, N., Czarnetzki, C., Dumont, L., Haller, G., Combescure, C., & Tramèr, M. R. (2009). Bispectral and spectral entropy indices at propofol-induced loss of consciousness in young and elderly patients. *British Journal of Anaesthesia*, aep162.
- Jagia, M., Prabhakar, H., & Dash, H. (2008). Comparative Evaluation of Spectral Entropy and Bispectral Index during Propofol/ Thiopentone Anaesthesia in Patients with Supratentorial Tumours-A Preliminary Study. *Indian Journal of Anesthesia*, 52(2), 175.
- Kawaguchi, M., Takamatsu, I., Masui, K., & Kazama, T. (2008). Effect of landiolol on bispectral index and spectral entropy responses to tracheal intubation during propofol anaesthesia. *British Journal of Anaesthesia*, 101(2), 273-278.
- Mahon, P., Greene, B. R., Greene, C., Boylan, G. B., & Shorten, G. D. (2008). Behaviour of spectral entropy, spectral edge frequency 90%, and alpha and beta power parameters during low-dose propofol infusion. *British Journal of Anaesthesia*, 101(2), 213-221.
- Schultz, A., Siedenberg, M., Grouven, U., Kneif, T., & Schultz, B. (2008). Comparison of Narcotrend Index, Bispectral Index, spectral and entropy parameters during induction of propofol-remifentanil anaesthesia. *Journal of Clinical Monitoring and Computing*, 22(2), 103-111.
- Weil, G., Passot, S., Servin, F., & Billard, V. (2008). Does spectral entropy reflect the response to intubation or incision during propofol-remifentanil anesthesia? *Anesthesia & Analgesia*, 106(1), 152-159.
- Gruenewald, M., Zhou, J., Schloemerkemper, N., Meybohm, P., Weiler, N., Tonner, P. H., ... Bein, B. (2007). M-Entropy guidance vs standard practice during propofol-remifentanil anaesthesia: a randomised controlled trial*. *Anaesthesia*, 62(12), 1224-1229.
- Kokki, H., Wennervirta, J., Laisalmi, M., & Vakkuri, A. (2007). Regular tramadol use does not affect the propofol dose requirement for induction of anaesthesia. *European Journal of Anaesthesiology*, 24(09), 776-781.
- Riad, W., Schreiber, M., & Saeed, A. B. (2007). Monitoring with EEG entropy decreases propofol requirement and maintains cardiovascular stability during induction of anaesthesia in elderly patients. *European Journal of Anaesthesiology*, 24(08), 684-688.
- Struys, M., Vanpeteghem, C., Huiku, M., Uutela, K., Blyaert, N. B. K., & Mortier, E. P. (2007). Changes in a surgical stress index in response to standardized pain stimuli during propofol--remifentanil infusion. *British Journal of Anaesthesia*, 99(3), 359-367.
- Bonhomme, V., Deflandre, E., & Hans, P. (2006). Correlation and agreement between bispectral index and state entropy of the electroencephalogram during propofol anaesthesia. *British Journal of Anaesthesia*, 97(3), 340-346.
- Ellerkmann, R. K., Soehle, M., Alves, T. M., Liermann, V.-M., Wenningmann, I., Roepcke, H., ... Bruhn, J. (2006). Spectral entropy and bispectral index as measures of the electroencephalographic effects of propofol. *Anesthesia & Analgesia*, 102(5), 1456-1462.
- Hans, P., Giwer, J., Brichant, J.-F., Dewandre, P.-Y., & Bonhomme, V. (2006). Effect of an intubation dose of rocuronium on Spectral Entropy and Bispectral Index™ responses to laryngoscopy during propofol anaesthesia. *British Journal of Anaesthesia*, 97(6), 842-847.
- Vereecke, H. E. M., Vanluchene, A. L., Mortier, E. P., Everaert, K., & Struys, M. M. R. F. (2006). The effects of ketamine and rocuronium on the A-Line{®} auditory evoked potential Index, Bispectral Index, and spectral entropy monitor during steady state propofol and remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 105(6), 1122-1134.
- Iannuzzi, M., Iannuzzi, E., Rossi, F., Berrino, L., & Chiefari, M. (2005). Relationship between bispectral index, electroencephalographic state entropy and effect-site EC50 for propofol at different clinical endpoints. *British Journal of Anaesthesia*, 94(4), 492-495.

Liu, N., Chazot, T., Huybrechts, I., Law-Koune, J.-D., Barvais, L., & Fischler, M. (2005). The influence of a muscle relaxant bolus on bispectral and datex-ohmeda entropy values during propofol-remifentanil induced loss of consciousness. *Anesthesia & Analgesia*, 101(6), 1713-1718.

Maksimow, A., Kaisti, K., Aalto, S., Mäenpää, M., Jääskeläinen, S., Hinkka, S., ... Scheinin, H. (2005). Correlation of EEG spectral entropy with regional cerebral blood flow during sevoflurane and propofol anaesthesia*. *Anaesthesia*, 60(9), 862-869.

Anderson, R. E., & Jakobsson, J. G. (2004). Entropy of EEG during anaesthetic induction: a comparative study with propofol or nitrous oxide as sole agent†. *British Journal of Anaesthesia*, 92(2), 167-170.

Anderson, R. E., Barr, G., Öwall, A., & Jakobsson, J. (2004). Entropy during propofol hypnosis, including an episode of wakefulness. *Anaesthesia*, 59(1), 52-56.

Schmidt, G. N., Bischoff, P., Standl, T., Hellstern, A., Teuber, O., & am Esch, J. S. (2004). Comparative evaluation of the Datex-Ohmeda S/5 Entropy Module and the Bispectral Index® monitor during propofol-remifentanil anesthesia. *The Journal of the American Society of Anesthesiologists*, 101(6), 1283-1290.

Vakkuri, A., Yli-Hankala, A., Talja, P., Mustola, S., Tolvanen-Laakso, H., Sampson, T., & Viertiö-Oja, H. (2004). Time-frequency balanced spectral entropy as a measure of anesthetic drug effect in central nervous system during sevoflurane, propofol, and thiopental anesthesia. *Acta Anaesthesiologica Scandinavica*, 48(2), 145-153.

Vanluchene, A. L. G., Struys, M., Heyse, B. E. K., & Mortier, E. P. (2004). Spectral entropy measurement of patient responsiveness during propofol and remifentanil. A comparison with the bispectral index. *British Journal of Anaesthesia*, 93(5), 645-654.

Reviews

Chhabra, A., Subramaniam, R., Srivastava, A., Prabhakar, H., Kalaivani, M., & Paranjape, S. (2016). Spectral entropy monitoring for adults and children undergoing general anaesthesia (Review). *Cochrane Database of Systematic Reviews*, (3), 1465-1858.

Shepherd, J., Jones, J., Frampton, G. K., Bryant, J., Baxter, L., & Cooper, K. (2013). Clinical effectiveness and cost-effectiveness of depth of anaesthesia monitoring (E-Entropy, Bispectral Index and Narcotrend): A systematic review and economic evaluation. *Health Technology Assessment*, 17(34), 1-264.

Davidson, A. J. (2007). Monitoring the anaesthetic depth in children--an update. *Current Opinion in Anesthesiology*, 20(3), 236-243.

Bein, B. (2006). Entropy. *Best Practice & Research Clinical Anaesthesiology*, 20(1), 101-109.

Bruhn, J., Myles, P. S., Sneyd, R., & Struys, M. (2006). Depth of anaesthesia monitoring: what's available, what's validated and what's next? *British Journal of Anaesthesia*, 97(1), 85-94.

Davidson, A. J. (2006). Measuring anaesthesia in children using the EEG. *Pediatric Anesthesia*, 16(4), 374-387.

Sevoflurane

Dinu, A. R., Rogobete, A. F., Popovici, S. E., Bedreag, O. H., Papurica, M., Dumbuleu, C. M., ... Sandesc, D. (2020). Impact of general anesthesia guided by state entropy (SE) and response entropy (RE) on perioperative stability in elective laparoscopic cholecystectomy patients - A prospective observational randomized monocentric study. *Entropy*, 22(3).

Oliveros, H., Ríos, F., Botero-Rosas, D. A., Quiroga, S. C., Cifuentes, F. C., Rodriguez, G. A., & Morales, M. P. (2020). Variability of anesthetic depth in total intravenous anesthesia vs balanced anesthesia using entropy indices: a randomized , crossover , controlled clinical trial. *Colombian Journal of Anesthesiology*, 48(3), 111-117.

Ravishankar, M., Mathew, D. M., Hemanthkumar, V. R., & Srinivasan, P. (2020). Quantifying influence of epidural analgesia on entropy guided general anaesthesia using sevoflurane - A randomised controlled trial. *Indian Journal of Anaesthesia*, 64(2), 131-137.

Kim, Y. S., Won, Y. J., Jeong, H., Lim, B. G., Kong, M. H., & Lee, I. O. (2019). A comparison of bispectral index and entropy during sevoflurane anesthesia induction in children with and without diplegic cerebral palsy. *Entropy*, 21(5).

Epstein, R. H., Maga, J. M., Mahla, M. E., Schwenk, E. S., & Bloom, M. J. (2018). Prevalence of discordant elevations of state entropy and bispectral index in patients at amnestic sevoflurane concentrations: a historical cohort study. *Canadian Journal of Anesthesia*, 65(5), 512-521.

Kannan, S., Surhone, N. S., Kumar, R. C., Kavitha, B., Rani, D. D., & Rao, R. S. R. (2018). Effects of bilateral superficial cervical plexus block of sevoflurane consumption during thyroid surgery under entropy-guided general anesthesia: a prospective randomized trial. *Korean Journal of Anesthesiology*, 71(2), 141-148.

Sciusco, A., Standing, J. F., Sheng, Y., Raimondo, P., Cinnella, G., & Dambrosio, M. (2017). Effect of age on the performance of bispectral and entropy indices during sevoflurane pediatric anesthesia: a pharmacometric study. *Pediatric Anesthesia*, 27(4), 399-408.

Bhaskara, B., Dayananda, V. P., Kannan, S., Rao, R. S. R., & Ramachandraiah, R. (2016). Effect of breastfeeding on haemodynamics and consumption of propofol and sevoflurane: A state entropy guided comparative study. *Indian Journal of Anaesthesia*, 60(3), 180.

Yassen, K., Abdullah, M., Koptan, H., Elshafie, M., & Yehyia, M. (2016). Entropy Monitoring Effect in Hepatic Cirrhotic Patients Undergoing Major Liver Resection on Sevoflurane Consumption and Hemodynamics. A Randomized Controlled Study. *Journal of Anesthesia & Critical Care: Open Access*, 5(3).

Aho, A. J., Kamata, K., Jäntti, V., Kulkas, A., Haghira, S., Huhtala, H., & Yli-Hankala, A. (2015). Comparison of Bispectral Index and Entropy values with electroencephalogram during surgical anaesthesia with sevoflurane. *British Journal of Anaesthesia*, 115(2), 258-266.

Abdelmageed, W. M., & Al Taher, W. M. (2014). Preoperative paracetamol infusion reduces sevoflurane consumption during thyroidectomy under general anesthesia with spectral entropy monitoring. *Egyptian Journal of Anaesthesia*, 30(2), 115-122.

Harsoor, S. S., Rani, D. D., Lathashree, S., Nethra, S. S., & Sudheesh, K. (2014). Effect of intraoperative Dexmedetomidine infusion on Sevoflurane requirement and blood glucose levels during entropy-guided general anesthesia. *Journal of Anaesthesiology, Clinical Pharmacology*, 30(1), 25.

Patel, C. R., Engineer, S. R., Shah, B. J., Madhu, S., & others. (2013). The effect of dexmedetomidine continuous infusion as an adjuvant to general anesthesia on sevoflurane requirements: a study based on entropy analysis. *Journal of Anaesthesiology Clinical Pharmacology*, 29(3), 318.

Shalbaf, R., Behnam, H., Sleigh, J., & Voss, L. (2012). Measuring the effects of sevoflurane on electroencephalogram using sample entropy. *Acta Anaesthesiologica Scandinavica*, 56(7), 880-889.

Kaskinoro, K., Maksimow, A., Långsjö, J. W., Aantaa, R., Jääskeläinen, S. K., Kaisti, K., ... Scheinin, H. (2011). Wide inter-individual variability of bispectral index and spectral entropy at loss of consciousness during increasing concentrations of dexmedetomidine, propofol, and sevoflurane. *British Journal of Anaesthesia*, 107(4), 573-580.

Choi, S. R., Lim, Y. H., Lee, S. C., Lee, J. H., & Chung, C. J. (2010). Spectral entropy monitoring allowed lower sevoflurane concentration and faster recovery in children. *Acta Anaesthesiologica Scandinavica*, 54(7), 859-862.

Li, D., Li, X., Liang, Z., Voss, L. J., & Sleigh, J. W. (2010). Multiscale permutation entropy analysis of EEG recordings during sevoflurane anesthesia. *Journal of Neural Engineering*, 7(4), 46010.

Ozcan, M. S., Ozcan, M. D., Khan, Q. S., Thompson, D. M., & Chetty, P. K. (2010). Does nitrous oxide affect bispectral index and state entropy when added to a propofol versus sevoflurane anesthetic? *Journal of Neurosurgical Anesthesiology*, 22(4), 309-315.

Smith, F. J., Spijkerman, S., Becker, P. J., & Coetzee, J. F. (2010). Entropy of the electroencephalogram as applied in the M-Entropy S/5™ Module (GE Healthcare) during increases in nitrous oxide and constant sevoflurane concentrations. *Southern African Journal of Anaesthesia and Analgesia*, 16(4).

Prabhakar, H., Ali, Z., Bithal, P. K., Rath, G. P., Singh, D., & Dash, H. H. (2009). Isoflurane and sevoflurane decrease entropy indices more than halothane at equal MAC values. *Journal of Anesthesia*, 23(1), 154-157.

Prabhakar, H., Ali, Z., Bithal, P. K., Singh, G. P., Laithangbam, P. K., & Dash, H. H. (2009). EEG entropy values during isoflurane, sevoflurane and halothane anesthesia with and without nitrous oxide. *Journal of Neurosurgical Anesthesiology*, 21(2), 108-111.

Wu, S.-C., Wang, P.-C., Liao, W.-T., Shih, T.-H., Chang, K.-A., Lin, K.-C., & Chou, A.-K. (2008). Use of spectral entropy monitoring in reducing the quantity of sevoflurane as sole inhalational anesthetic and in decreasing the need for antihypertensive drugs in total knee replacement surgery. *Acta Anaesthesiologica Taiwanica*, 46(3), 106-111.

- Enlund, M., & Jansson, P. (2007). A comparison of auditory evoked potentials and spectral EEG in the ability to detect marked sevoflurane concentration alterations and clinical events. *Upsala Journal of Medical Sciences*, 112(2), 221-229.
- Lefoll-Masson, C., Fermanian, C., Aimé, I., Verroust, N., Taylor, G., Laloë, P.-A., ... Fischler, M. (2007). The comparability of bispectral index and state entropy index during maintenance of sufentanil-sevoflurane-nitrous oxide anesthesia. *Anesthesia & Analgesia*, 105(5), 1319-1325.
- Aimé, I., Verroust, N., Masson-Lefoll, C., Taylor, G., Laloë, P. A., Liu, N., & Fischler, M. (2006). Does monitoring bispectral index or spectral entropy reduce sevoflurane use? *Anesthesia and Analgesia*, 103(6), 1469-1477.
- McKay, I. D. H., Voss, L. J., Sleigh, J. W., Barnard, J. P., & Johannsen, E. K. (2006). Pharmacokinetic-pharmacodynamic modeling the hypnotic effect of sevoflurane using the spectral entropy of the electroencephalogram. *Anesthesia & Analgesia*, 102(1), 91-97.
- Rinaldi, S., Consales, G., & De Gaudio, A. R. (2006). State entropy and bispectral index: correlation with end tidal sevoflurane concentrations. *Minerva Anestesiologica*, 73(1-2), 39-48.
- Takamatsu, I., Ozaki, M., & Kazama, T. (2006). Entropy indices vs the bispectral index™ for estimating nociception during sevoflurane anaesthesia. *British Journal of Anaesthesia*, 96(5), 620-626.
- Hans, P., Dewandre, P.-Y., Brichant, J.-F., & Bonhomme, V. (2005). Effects of nitrous oxide on spectral entropy of the EEG during surgery under balanced anaesthesia with sufentanil and sevoflurane. *Acta Anaesthesiol Belg*, 56(1), 37-43.
- Hans, P., Dewandre, P.-Y., Brichant, J.-F., & Bonhomme, V. (2005). Comparative effects of ketamine on Bispectral Index and spectral entropy of the electroencephalogram under sevoflurane anaesthesia. *British Journal of Anaesthesia*, 94(3), 336-340.
- Maksimow, A., Kaisti, K., Aalto, S., Mäenpää, M., Jääskeläinen, S., Hinkka, S., ... Scheinin, H. (2005). Correlation of EEG spectral entropy with regional cerebral blood flow during sevoflurane and propofol anaesthesia*. *Anaesthesia*, 60(9), 862-869.
- Seitsonen, E. R. J., Korhonen, I. K. J., Van Gils, M. J., Huiku, M., Lötjönen, J. M. P., Korttila, K. T., & Yli-Hankala, A. M. (2005). EEG spectral entropy, heart rate, photoplethysmography and motor responses to skin incision during sevoflurane anaesthesia. *Acta Anaesthesiologica Scandinavica*, 49(3), 284-292.
- Ellerkmann, R. K., Liermann, V.-M., Alves, T. M., Wenningmann, I., Kreuer, S., Wilhelm, W., ... Bruhn, J. (2004). Spectral entropy and bispectral index as measures of the electroencephalographic effects of sevoflurane. *The Journal of the American Society of Anesthesiologists*, 101(6), 1275-1282.
- Nunes, R. R. (2004). Entropy: A new method of measuring depth of anesthesia. Comparative study with bispectral index during clinical evaluation in tracheal intubation of patients anesthetized with sevoflurane. *Revista Brasileira de Anestesiologia*, 54(3), 289-302.
- Vakkuri, A., Yli-Hankala, A., Talja, P., Mustola, S., Tolvanen-Laakso, H., Sampson, T., & Viertiö-Oja, H. (2004). Time-frequency balanced spectral entropy as a measure of anesthetic drug effect in central nervous system during sevoflurane, propofol, and thiopental anesthesia. *Acta Anaesthesiologica Scandinavica*, 48(2), 145-153.
- ### Thiopental
- Jagia, M., Prabhakar, H., & Dash, H. (2008). Comparative Evaluation of Spectral Entropy and Bispectral Index during Propofol/ Thiopentone Anaesthesia in Patients with Supratentorial Tumours-A Preliminary Study. *Indian Journal of Anesthesia*, 52(2), 175.
- Vakkuri, A., Yli-Hankala, A., Talja, P., Mustola, S., Tolvanen-Laakso, H., Sampson, T., & Viertiö-Oja, H. (2004). Time-frequency balanced spectral entropy as a measure of anesthetic drug effect in central nervous system during sevoflurane, propofol, and thiopental anesthesia. *Acta Anaesthesiologica Scandinavica*, 48(2), 145-153.
- ### Xenon
- Höcker, J., Raitschew, B., Meybohm, P., Broch, O., Stapelfeldt, C., Gruenewald, M., ... Bein, B. (2010). Differences between bispectral index and spectral entropy during xenon anaesthesia: a comparison with propofol anaesthesia. *Anaesthesia*, 65(6), 595-600.
- Laitio, R. M., Kaskinoro, K., Särkelä, M. O. K., Kaisti, K. K., Salmi, E., Maksimow, A., ... others. (2008). Bispectral index, entropy, and quantitative electroencephalogram during single-agent xenon anesthesia. *The Journal of the American Society of Anesthesiologists*, 108(1), 63-70.



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