

While Perioperative Care Is Optimized, Patients Die Unmonitored In The Ward



There is a high demand for a comfortable, small and mobile solution for affordable blood pressure and vital sign monitoring in the general ward to improve patient safety and outcome, as mortality after surgery is a thousand times higher than intraoperative death.¹ CNSystems has enhanced its non-invasive CNAP[®] technology for perioperative care with its new "CNAP[®]2GO" finger ring, suitable for ward monitoring. Its clinical accuracy has been outlined in a recent publication in NATURE Communications.²

Patients and their families often fear surgical interventions due to possible complications during the procedure and falsely assume to have survived the most dangerous part when reaching post-anesthetic care units.¹ However, postoperative hypotension more often occurs in the wards, causing myocardial infarction and death^{3,4}, as it largely remains undetected⁵. "Clinicians should not assume that ward hypotension is benign just because it is common."³ 47% of postsurgical hypotensive events are missed due to doing only blood pressure spot-checks.⁶ Postoperative complications represent the third leading cause of death in the world.⁴

These alarming facts have a substantial impact on healthcare budgets: representing the third leading cause of death in the world⁴, postsurgical complications can increase costs by +172%⁷, due to reported complication rates ranging up to 27%⁸ and mortality of up to 12%⁷ in postsurgical patients. The resulting prolongations of hospital stays are 2.5 times higher than in patients without postoperative complications.^{9,10}

Only recently, experts have confirmed the high potential of reducing risks and costs of postoperative complications by extending continuous hemodynamic monitoring throughout the hospital stay.

During surgery approaches such as Goal Directed Therapy (GDT), using advanced hemodynamic monitoring to guide individualized fluid management is already successfully implemented.^{11,12,13} With the help of non-invasive technologies – such as CNAP[®]^{14,15} – this concept can even be applied to low and medium-risk surgeries, which comprise the majority of surgical patients.

However, on surgical wards blood pressure is usually measured only every 4 to 6 hours, leaving long intervals during which hypotension remains undetected⁶ and patients' deterioration is often overlooked³. To date, continuous hemodynamic monitoring is poorly implemented on the wards because the demands are completely different than during perioperative monitoring. I.e. patients are supposed to get up from their beds and move around in due course after surgery, therefore wireless technologies in the form of wearable sensors are needed⁵. Other demands are a low cost, due to the large patient population, and wearing comfort in order to achieve patient acceptance.

In order to address these challenges, new sensor concepts are required. Only recently, CNAP[®]2GO, an innovative concept for measuring blood pressure and other vital signs using a wearable finger ring, has been introduced in the NATURE Communications Journal. With its wireless setup and high wearing comfort, CNAP[®]2GO seems able to address all major demands on the wards, and clinical accuracy against invasive reference standards showed comparable results to its parent technology – CNAP[®] – for perioperative hemodynamic monitoring.²

With this ongoing development, CNSystems strives for a new tailor-made solution, covering the whole cycle of hemodynamic monitoring throughout the hospital stay of a surgical patient. All CNAP[®] solutions feature an easy and fast setup and well-founded clinical validation.

Non-invasive beat-to-beat hemodynamic monitoring is already established common practice – THE FUTURE IS WEARABLE!

© For personal and private use only. Reproduction must be permitted by the copyright holder. Email to copyright@mindbyte.eu.

References:

- Sessler, D. I. & Saugel, B. Beyond 'failure to rescue': the time has come for continuous ward monitoring. *Br. J. Anaesth.* 122, 304–306 (2019).
- Fortin, J. et al. A novel art of continuous non-invasive blood pressure measurement. *Nat. Commun.* 12, 1–14 (2021).
- Sessler, D. I. et al. Period-dependent Associations between Hypotension during and for Four Days after Noncardiac Surgery and a Composite of Myocardial Infarction and Death: A Substudy of the POISE-2 Trial. *Anesthesiology* 128, 317–327 (2018).
- Michard, F., Biais, M., Lobo, S. M. & Futier, E. Perioperative Hemodynamic Management 4.0. *Best Pract. Res. Clin. Anaesthesiol.* (2019) doi:10.1016/j.bpa.2019.04.002.
- Michard, F., Scheeren, T. W. L. & Saugel, B. A glimpse into the future of postoperative arterial blood pressure monitoring. *Br. J. Anaesth.* 125, 113–115 (2020).
- Turan, A. et al. Incidence, Severity, and Detection of Blood Pressure Perturbations after Abdominal Surgery. *Anesthesiology* 130, 550–559 (2019).
- Manecke, G. R., Asemota, A. & Michard, F. Tackling the economic burden of postsurgical complications: would perioperative goal-directed fluid therapy help? *Crit. Care* 18, 566 (2014).
- de la Plaza Llamas, R. et al. The Cost of Postoperative Complications and Economic Validation of the Comprehensive Complication Index: Prospective Study. *Ann. Surg.* 273, 112–120 (2021).
- Sean M Stokes 1 , Courtney L Scaife, Benjamin S Brooke, Robert E Glasgow, Sean J Mulvihill, Samuel R G Finlayson, T. K. V. J. Hospital Costs Following Surgical Complications: A Value-driven Outcomes Analysis of Cost Savings Due to Complication Prevention. *Ann Surg* (2020) doi:doi: 10.1097/SLA.0000000000004243. Online ahead of print.
- Healy, M. A., Mullard, A. J., Campbell, D. A. & Dimick, J. B. Hospital and payer costs associated with surgical complications. *JAMA Surg.* 151, 823–830 (2016).
- Sessler, D. I. et al. Perioperative Quality Initiative consensus statement on intraoperative blood pressure, risk and outcomes for elective surgery. *Br. J. Anaesth.* 122, 563–574 (2019).
- Messina, A. et al. Association between perioperative fluid administration and postoperative outcomes: a 20-year systematic review and a meta-analysis of randomized goal-directed trials in major visceral/noncardiac surgery. *Crit. Care* 25, 1–14 (2021).
- Benes, J. et al. Continuous non-invasive monitoring improves blood pressure stability in upright position: randomized controlled trial. *J. Clin. Monit. Comput.* 29, 11–7 (2015).
- Song, J. & Chen, H. Efficacy of Goal-Directed Fluid Therapy Monitored by Pulse-Pressure Variation Using a Continuous Non-Invasive Arterial Pressure Monitoring System (the CNAPTM System) During Parathyroidectomy in Patients with End-Stage Renal Failure – A randomized trial. *Res. Sq.* 1–30 (2019) doi:10.21203/rs.2.10803/v2.
- Stenglöva, A. & Benes, J. Continuous Non-Invasive Arterial Pressure Assessment during Surgery to Improve Outcome. *Front. Med.* 4, 1–8 (2017).

Published on : Fri, 9 Apr 2021