were used to compare categorical data and continuous data. A $p < 0.05$ was considered significantly.

Results and Discussion: Demographic data (including age, gender, weight, he-ight, heart rate, ejection fraction) were similar in both groups. Duration of $T_1$and T_2 between control and study group were not significant difference (6.9 ± 3.6vs.7.9 ± 3.7, P = 0.26,10.4 ± 4.5vs.10.9 ± 4.1sec, P = 0.66). Eighteen patients in study group (26.8%)and 14 patients in control group (20.9%)developed benign arrhythmias. Five patients (15.2%) in control group had experiencing severe ventricular arrhythmias during catheter passing from right ventricle to pulmonary artery, whereas none of patient in study group had this incident. All patients had stable hemodynamic and no treatment was required. The position of catheters was evaluated by transesophageal echocardiography and chest radiograph postoperatively. Tip of all catheters except one in control group were located in right pulmonary artery. No catheter-related complication was seen in this study.

Conclusion(s): Although the success of both groups was not different, the incidence of serious arrhythmias occurred more frequently in the conventional technique. Adjusting patient's position during passing the floating catheter could be used as an alternative method in minimizing serious arrhythmias.

Reference:

1 Iberti TJ, Benjamin E, Gruppi L, et al. Am J Med1985; 78:451–4.

4AP8-5

Haemodynamic effects of sub-anaesthetic doses of nitrous oxide as assessed by finometry

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Background and Goal of Study: Nitrous oxide, in sub-anaesthetic doses, is often used for short-term analgesia during orthopaedic manipulations, minor surgery or labour. Inhalation of 30% nitrous oxide has been recently shown to increase parasympathetic tone. [1] The gross haemodynamic effects of sub-anaesthetic doses of nitrous oxide are not well described. We used Finometry to investigate the effects of nitrous oxide inhalation, in the range of 10–50%, on systemic haemodynamic variables in healthy volunteers.

Materials and Methods: 17 volunteers were recruited. Continuous non-invasive measurements of heart rate (HR beats/min), blood pressure (mm Hg), cardiac output (CO litres/min) and total peripheral resistance (TPR mm Hg s/ml) were made using the Finometer. The volunteers inhaled nitrous oxide in 10% step changes between 0–50%, in randomly allocated ascending or descending order. After each change in nitrous oxide concentration was introduced, a 5 minute period was allowed to reach steady state. Data were recorded using purpose built software for off-line analysis. Measurements were subsequently averaged over a 1 minute window during steady state, and repeated measure ANOVA was applied for analysis.

Results and Discussion: None of the measured variables changed significantly at different concentrations of nitrous oxide.

Effects of Nitrous Oxide in subanaesthetic concentrations on haemodynamics. Data are mean (SD)

	baseline	10% N_2O	20% N_2O	30% N_2O	40% N_2O	50% N_2O
HR	62 (12)	62 (12)	61 (12)	61 (11)	61 (11)	65 (15)
MAP	92 (9)	91 (13)	92 (12)	93 (12)	92 (10)	92 (10)
CO	7.2 (1.9)	6.9 (2.1)	6.8 (1.5)	7.0 (1.5)	6.8 (1.3)	6.9 (1.8)
TPR	0.81 (0.15)	0.84 (0.14)	0.85 (0.13)	0.82 (0.14)	0.84 (0.13)	0.83 (0.15)

Conclusion(s): Our data suggests that gross haemodynamic variables remain unchanged during inhalation of sub-anaesthetic doses of nitrous oxide in healthy volunteers. This information should serve as a reference point when interpreting haemodynamic changes in the clinical setting in patients receiving sub-anaesthetic doses of nitrous oxide.

Acknowledgement: BOC Inspire Award.

Reference:

1 Okushima K, Kohjitani A, Asano Y et al. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008 Dec;106(6):e1–5.

4AP8-6

Lower body temperature during CPB is associated with postoperative thrombocytopenia and increased organ injury

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Background and Goal of Study: Cardiopulmonary bypass (CPB) is associated with postoperative organ damage, resulting in increased morbidity and mortality. To establish effects of different body temperature ranges during CPB, we assessed blood cell counts and markers for organ damage in patients undergoing hypothermic CPB.

Materials and Methods: Records from the OR and hospital databases of all adult patients undergoing hypothermic CPB in the University Medical Center Groningen were selected (n = 184). Preoperative values were compared to values measured during 48 h postoperative follow-up. Patients were divided into quartiles based on the temperature during CPB. Differences were calculated using non-parametric tests. Data are presented as mean ± SD. Statistical significance was accepted at $p < 0.05$.

Results and Discussion: The duration of surgery was increased in patients with lower body temperatures (table). A larger decrease in thrombocyte counts was found in patients with lower body temperatures. Serum creatinin levels increased in patients with lowest body temperature. While CK-MB increased in all groups after surgery, the increase was larger in patients with lower body temperatures. Thus, a correlation was found between thrombocyte counts and body-temperature during surgery ($p < 0.01$).

Conclusion(s): Serious lowering of body temperature during CPB seems to induce thrombocytopenia and organ injury during the postoperative period. Possibly, the organ injury is related to hypothermia-induced platelet activation in organs.

Demographic data and blood cell counts of patients undergoing hypothermic CPB (n = 184).

	1st quartile	2nd quartile	3rd quartile	4th quartile
Body temp (°C)	19.7 ± 12.0 ††	21.3 ± 2.0 **/††	25.5 ± 1.4 **/††	29.0 ± 2.7 **
Duration of surgery (min)	401 ± 149 ††	369 ± 116 ††	317 ± 121 */††	257 ± 117 **
Hb pre-CPB (mmol)	7.7 ± 1.3	11.3 ± 23.5	7.8 ± 1.2	15.1 ± 28.1
Hb post-CPB (mmol)	6.1 ± 0.9	6.0 ± 0.7	6.1 ± 0.6	6.1 ± 0.7
Platelets pre-CPB (10^9/L)	217 ± 98	206 ± 95	237 ± 100	225 ± 67
Platelets post-CPB (10^9/L)	109 ± 50 ††	121 ± 56 ††	140 ± 62 *	140 ± 46 **
Leukocytes pre-CPB (10^9/L)	10.9 ± 4.8	10.1 ± 5	8.4 ± 2.5	9.0 ± 4.1
Leukocytes post-CPB (10^9/L)	13.8 ± 3.6	12.4 ± 4	13.9 ± 4.4	14.1 ± 4.6
CK-MB pre-CPB (U/L)	4.4 ± 4.5	20.2 ± 55.2	10.1 ± 9.8	18.3 ± 23.1
CK-MB post-CPB (U/L)	20.0 ± 13.3	26.9 ± 37.1	33.8 ± 47.9	22.3 ± 34.6

*/** ($p < 0.05/0.01$) vs 1st quartile; †/†† ($p < 0.05/0.01$) vs 4th quartile.

4AP8-7

Digital thermal monitoring: Non-invasive assessment of perioperative microvascular function

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Background and Goal of Study: Systemic inflammation may impair microvascular and more specifically endothelial cell (EC) function (1–3). Quantifying preop (1°, from co-morbidities) and perioperative (2°, from surgical inflammatory response) EC dysfunction may improve our understanding of the pathophysiology of postop morbidity. Digital Thermal Monitoring (DTM; Endothelix, Houston, TX, USA), a novel non-invasive method of assessing microvascular and EC function, measures temperature (T) change in the fingertip in response to forearm induced ischemia. Importantly, DTM lends itself to repetitive point-of-care testing-facilitating cardiovascular (4) and periop risk assessment. We set out to characterize the reactive hyperemic response to exercise and to the periop period.

Materials and Methods: Following IRB approval, 40 patients scheduled for major thoracic surgery were studied prospectively. Fingertip probes measured T [°C] prior to (T_i, initial temperature), during (T_{min}, lowest temperature during ischemia), and following (T_{max}, highest temperature during reactive hyperemia) 2-minutes of upper arm cuff occlusion. Three variables were derived: temperature rebound ($TR = T_{max} – T_i$); TR% (TR [%] = TR/Ti); and adjusted TR ($aTR = T_{min}$ – peak TR). These variables were measured at: baseline (preoperative), 10 minutes after maximal voluntary exercise (preoperative, using a cycle ergometer), and postoperatively on Day 1, 2, and 5. The Kruskal-Wallis test (with Dunn's Correction for Multiple Comparisons) evaluated these variables over the measured time points.

Results and Discussion: Compared to preoperative values, the hyperemic response (TR °C,%TR was increased in response to surgery, with the greatest response seen after acute maximal exercise ($p < 0.05$). Maximal increase in postoperative temperature respnse was seen postop D2.