nociception. The purpose of this study was to investigate D in anaesthetised patients without neuromuscular blocking agent (NMBA) medication before and after intubation and skin incision.

Methods: 32 patients were anaesthetised, 17 with propofol-N₂O (P) and 15 with sevoflurane-N₂O (S). The anaesthesia was adjusted to keep SE between 40 and 60. After endotracheal intubation without NMBA the patients remained undisturbed for 5 minutes.

Results: D decreased after anaesthetic induction. Intubation was associated with an increase in D from 3 (3.2) to 6.8 (6.5) (mean (SD)) in P and from 2.5 (1.9) to 5.9 (3.4) in S, respectively (P < 0.01). After 4 min undisturbed the D was 5.4 (3.8) in P and 1.8 (1.6) in S (P < 0.01 between P and S). After skin incision D increased from 5.2 (4.4) to 8 (5.4) in P and from 2.6 (3.3) to 6.2 (4.9) in S, respectively (P < 0.01).

Conclusions: RE-SE-difference of Entropy increased significantly during nociceptive stimuli in clinically meaningful propofol and sevoflurane anaesthesia in unparalysed patients. The rather high RE-SE-difference in propofol anaesthesia without surgery may indicate smaller analgesic impact of propofol, compared to sevoflurane.

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Wedging the Swan-Ganz catheter; risk of perforation and changes in left atrial and pulmonary artery pressure

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Aims: To report perforations of the pulmonary artery with the Swan-Ganz catheter in our unit during the last 30 years. To study if measurable changes hemodynamic occur during wedging of the Swan-Ganz catheter. Patient and experimental data have indicated that such changes occur, when there is lung pathology.

Methods: Retrospective analysis of our complications. Ten adult patients undergoing heart surgery with cardiopulmonary bypass had epidural catheters in the pulmonary artery and left atrium and a 7.5 F Swan-Ganz catheter, which was wedged 3 times with the chest open and 3 times with the chest closed.

Results: There were 4 perforations in 2500 patients. Mean left atrial pressure (MLAP) decreased during wedging from 13.5 ± 2.8 (standard deviation) mm Hg to 13.0 ± 3.0 (open chest) and from 15.8 ± 3.2 to 15.2 ± 3.1 (closed), P < 0.001. Wedge pressure did not differ from MLAP. Mean pulmonary artery pressure increased from 18.8 ± 3.5 to 19.7 ± 3.5 (open) and from 21.3 ± 4.3 to 21.9 ± 4.2 (closed), P < 0.001. Cardiac output was unchanged. Conclusions: Distal migration of the Swan-Ganz catheter between wedging manoeuvres implies a risk for over-distension and rupture of the pulmonary artery, which could be reduced with a technique described by Kearny et al (Chest 108:1349-52, 1995). The immediate effect of wedging had a 20–25% increase of the pressure difference across the lungs. The small decrease in MLAP would only affect calculation of the pulmonary vascular resistance by 9%, which has no clinical significance.

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Extravascular lung water after pneumonectomy

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Aims: We compared extravascular lung water index, determined with the transpulmonary single thermodilution (EVLWIₜₚₐ) and the thermo-dye dilution (EVLWIₜₚ₉), with post mortem gravimetry (EVLWIₑₚ₉) before and after pneumonectomy (PE).

Methods: Thirty-four sheep were anesthetized and underwent thoracotomy and left (n = 7, LPE group) or right (n = 6, RPE group) pneumonectomy. After determining EVLWIₜₚ₉ and EVLWIₜ₉₀ (PICCOplus and COLD-Z021, respectively, Pulsion Medical Systems), lungs were harvested separately for EVLWIₑₚ₉. To evaluate the relationships between EVLWIₜ₉₀, EVLWIₜ₉₀ and EVLWIₑₚ₉, we used linear regression and Bland-Altman analysis. P < 0.05 was regarded statistically significant.

Results: After PE, EVLWIₜ₉₀ and EVLWIₜ₉₀ decreased by 30% and 40% in the LPE group and by 34% and 54% in the RPE group, respectively (P < 0.05). EVLWIₑₚ₉ derived from both lungs correlated significantly with EVLWIₜ₉₀ (r² = 0.61) and EVLWIₜ₉₀ (r² = 0.38) measured at the baseline. EVLWIₑₚ₉ of residual lung correlated with the last measurement of EVLWIₜ₉₀ (r² = 0.33) and EVLWIₜ₉₀ (r² = 0.68). In summary, r² values were 0.85 for EVLWIₜ₉₀ vs. EVLWIₑₚ₉ and 0.81 for EVLWIₜ₉₀ vs. EVLWIₑₚ₉, respectively (n = 26, P < 0.05). After PE, the mean bias ± 2SD was 2.19 ± 1.61 ml/kg between EVLWIₑₚ₉ and EVLWIₑₚ₉ and 0.24 ± 1.22 ml/kg between EVLWIₜ₉₀ and EVLWIₑₚ₉ (P < 0.05).

Conclusions: After lung volume reduction, EVLWIₜ₉₀ and EVLWIₜ₉₀ correlated closely with EVLWIₑₚ₉. In spite of moderate overestimation compared with postmortem EVLWIₑₚ₉, both thermodilution methods might become useful monitoring tools in major lung surgery allowing an unlimited number of measurements peroperatively.

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Trans-pharyngeal ultrasound guided internal jugular vein cannulation

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Aims: To describe the technique of Trans-pharyngeal ultrasound to guide cannulation of the internal jugular vein.

Methods: The short axis view of the neck vascular bundle is achieved through the transpharyngeal position of the transesophageal echocardiography probe. The probe is inserted 12–20 cm from the jaw and rotated laterally 15–20 degrees throughout the pharyngeal lateral wall. When the proper position of the probe is achieved, it can be left stable on the trolley. The needle is introduced into the vein under real time ultrasound vision. During the last 2 years, we selected 75 cardiac patients in whom jugular vein cannulation would be difficult or at risk (previous carotid surgery, coagulopathies, predicted difficult anatomy) and who were elected to be monitored with the transoesophageal echocardiography.

Results: Ultrasound guided cannulation was successful from the first attempt in all the patients without any immediate complications.

Conclusions: Further studies are needed to assess the reliability of this method for routine use, as well as its proper indications and to compare it with conventional ultrasonography.

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