



XV Congresso Mineiro de **MEDICINA INTENSIVA**

25 a 27 de maio de 2017
Hotel Dayrell - Belo Horizonte

I Congresso Abramede-MG

O tema Sepsis será amplamente debatido no **XV Congresso Mineiro de Medicina Intensiva e I Congresso Abramede MG**.

Separamos alguns artigos relacionados ao tema para você se preparar para o evento. Veja nossas recomendações:

<http://jamanetwork.com/journals/jama/fullarticle/2492881>

SINGER M, DEUTSCHMAN CS, SEYMOUR CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis- 3). JAMA, Londres, v.315, n.8, p.801-810, Fev 23 2016.

[Respir Med Case Rep.](#) 2017 Jan 17;20:141-144. doi: 10.1016/j.rmcr.2017.01.008. eCollection 2017.

[Electrical impedance tomography and trans-pulmonary pressure measurements in a patient with extreme respiratory drive.](#)

[Shono A¹, Somhorst P¹, Gommers D¹.](#)

[Author information](#)

Abstract

Preserving spontaneous breathing during mechanical ventilation prevents muscle atrophy of the diaphragm, but may lead to ventilator induced lung injury (VILI). We present a case in which monitoring of trans-pulmonary pressure and ventilation distribution using Electrical Impedance Tomography (EIT) provided essential information for preventing VILI

[Targeting urine output and 30-day mortality in goal-directed therapy: a systematic review with meta-analysis and meta-regression.](#)

[van der Zee EN](#)¹, [Egal M](#)^{2,3}, [Gommers D](#)¹, [Groeneveld AB](#)¹.

[Author information](#)

Abstract

BACKGROUND:

Oliguria is associated with a decreased kidney- and organ perfusion, leading to organ damage and increased mortality. While the effects of correcting oliguria on renal outcome have been investigated frequently, whether urine output is a modifiable risk factor for mortality or simply an epiphenomenon remains unclear. We investigated whether targeting urine output, defined as achieving and maintaining urine output above a predefined threshold, in hemodynamic management protocols affects 30-day mortality in perioperative and critical care.

METHODS:

We performed a systematic review with a random-effects meta-analysis and meta-regression based on search strategy through MEDLINE, EMBASE and references in relevant articles. We included studies comparing conventional fluid management with goal-directed therapy and reporting whether urine output was used as target or not, and reporting 30-day mortality data in perioperative and critical care.

RESULTS:

We found 36 studies in which goal-directed therapy reduced 30-day mortality (OR 0.825; 95% CI 0.684-0.995; P = 0.045). Targeting urine output within goal-directed therapy increased 30-day mortality (OR 2.66; 95% CI 1.06-6.67; P = 0.037), but not in conventional fluid management (OR 1.77; 95% CI 0.59-5.34; P = 0.305). After adjusting for operative setting, hemodynamic monitoring device, underlying etiology, use of vasoactive medication and year of publication, we found insufficient evidence to associate targeting urine output with a change in 30-day mortality (goal-directed therapy: OR 1.17; 95% CI 0.54-2.56; P = 0.685; conventional fluid management: OR 0.74; 95% CI 0.39-1.38; P = 0.334).

CONCLUSIONS:

The principal finding of this meta-analysis is that after adjusting for confounders, there is insufficient evidence to associate targeting urine output with an effect on 30-day mortality. The paucity of direct data illustrates the need for further research on whether permissive oliguria should be a key component of fluid management protocols.

KEYWORDS:

Critical care; Mortality; Oliguria; Perioperative care

Select item 27864895 3.

[Transpl Int.](#) 2016 Nov 19. doi: 10.1111/tri.12891. [Epub ahead of print]

[The postreperfusion syndrome is associated with acute kidney injury following donation after brain death liver transplantation.](#)

[Kalisvaart M](#)¹, [de Haan JE](#)², [Hesselink DA](#)³, [Polak WG](#)¹, [Hansen BE](#)⁴, [IJzermans JN](#)¹, [Gommers D](#)², [Metselaar HJ](#)⁴, [de Jonge J](#)¹.

[Author information](#)

Abstract

Acute kidney injury (AKI) is frequently observed after donation after brain death (DBD) liver transplantation (LT) and associated with impaired recipient survival and chronic kidney disease. Hepatic ischemia/reperfusion injury (IRI) is suggested to be an important factor in this process. The postreperfusion syndrome (PRS) is the first manifestation of severe hepatic IRI directly after reperfusion. We performed a retrospective study on the relation between hepatic IRI and PRS and their impact on AKI in 155 DBD LT recipients. Severity of hepatic IRI was measured by peak postoperative AST levels and PRS was defined as >30% decrease in MAP \geq 1 min within 5 min after reperfusion. AKI was observed in 39% of the recipients. AKI was significantly more observed in recipients with PRS (53% vs. 32%; $P = 0.013$). Median peak AST level was higher in recipients with PRS (1388 vs. 771 U/l; $P < 0.001$). Decrease in MAP after reperfusion correlated well with both severity of AKI ($P = 0.012$) and hepatic IRI ($P < 0.001$). Multiple logistic regression identified PRS as an independent factor for postoperative AKI (OR 2.28; 95% CI 1.06-4.99; $P = 0.035$). In conclusion, PRS reflects severe hepatic IRI and predicts AKI after DBD LT. PRS immediately after reperfusion is an early warning sign and creates opportunities to preserve postoperative renal function.

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KEYWORDS:

acute kidney injury; donation after brain death liver transplantation; hepatic ischemia/reperfusion injury; postreperfusion syndrome

Select item 27776535 4.

[Crit Care.](#) 2016 Oct 25;20(1):344.

[Microcirculatory assessment of patients under VA-ECMO.](#)

[Kara A](#)^{1,2,3}, [Akin S](#)^{4,5}, [Dos Reis Miranda D](#)⁴, [Struijs A](#)⁴, [Caliskan K](#)⁵, [van Thiel RJ](#)⁴, [Dubois EA](#)⁵, [de Wilde W](#)⁶, [Zijlstra F](#)⁵, [Gommers D](#)⁴, [Ince C](#)⁴.

Author information

Abstract

BACKGROUND:

Veno-arterial extracorporeal membrane oxygenation (VA-ECMO) is an effective technique for providing emergency mechanical circulatory support for patients with cardiogenic shock. VA-ECMO enables a rapid restoration of global systemic organ perfusion, but it has not been found to always show a parallel improvement in the microcirculation. We hypothesized in this study that the response of the microcirculation to the initiation of VA-ECMO might identify patients with increased chances of intensive care unit (ICU) survival.

METHODS:

Twenty-four patients were included in this study. Sublingual microcirculation measurements were performed using the CytoCam-IDF (incident dark field) imaging device. Microcirculatory measurements were performed at baseline, after VA-ECMO insertion (T1), 48-72 h after initiation of VA-ECMO (T2), 5-6 days after (T3), 9-10 days after (T4), and within 24 h of VA-ECMO removal.

RESULTS:

Of the 24 patients included in the study population, 15 survived and 9 died while on VA-ECMO. There was no significant difference between the systemic global hemodynamic variables at initiation of VA-ECMO between the survivors and non-survivors. There was, however, a significant difference in the microcirculatory parameters of both small and large vessels at all time points between the survivors and non-survivors. Perfused vessel density (PVD) at baseline (survivor versus non-survivor, 19.21 versus 13.78 mm/mm², $p = 0.001$) was able to predict ICU survival on initiation of VA-ECMO; the area under the receiver operating characteristic curve (ROC) was 0.908 (95 % confidence interval 0.772-1.0).

CONCLUSION:

PVD of the sublingual microcirculation at initiation of VA-ECMO can be used to predict ICU mortality in patients with cardiogenic shock.

KEYWORDS:

Cardiogenic shock; ICU; Microcirculation; Survival; VA-ECMO

Select item 27596161 5.

[Thorax](#). 2017 Jan;72(1):83-93. doi: 10.1136/thoraxjnl-2016-208357. Epub 2016 Sep 5.

[Chest electrical impedance tomography examination, data analysis, terminology, clinical use and recommendations: consensus statement of the TRanslational EIT developmeNtstuDy group.](#)

[Frerichs I](#)¹, [Amato MB](#)², [van Kaam AH](#)³, [Tingay DG](#)⁴, [Zhao Z](#)⁵, [Grychtol B](#)⁶, [Bodenstein M](#)⁷, [Gagnon H](#)⁸, [Böhm SH](#)⁹, [Teschner E](#)¹⁰, [Stenqvist O](#)¹¹, [Mauri T](#)¹², [Torsani V](#)², [Camporota L](#)¹³, [Schibler A](#)¹⁴, [Wolf GK](#)¹⁵, [Gommers D](#)¹⁶, [Leonhardt S](#)¹⁷, [Adler A](#)^{8*}, [TREND study group](#).

[Collaborators \(7\)](#)

[Author information](#)

Abstract

Electrical impedance tomography (EIT) has undergone 30 years of development. Functional chest examinations with this technology are considered clinically relevant, especially for monitoring regional lung ventilation in mechanically ventilated patients and for regional pulmonary function testing in patients with chronic lung diseases. As EIT becomes an established medical technology, it requires consensus examination, nomenclature, data analysis and interpretation schemes. Such consensus is needed to compare, understand and reproduce study findings from and among different research groups, to enable large clinical trials and, ultimately, routine clinical use. Recommendations of how EIT findings can be applied to generate diagnoses and impact clinical decision-making and therapy planning are required. This consensus paper was prepared by an international working group, collaborating on the clinical promotion of EIT called TRanslational EIT developmeNtstuDy group. It addresses the stated needs by providing (1) a new classification of core processes involved in chest EIT examinations and data analysis, (2) focus on clinical applications with structured reviews and outlooks (separately for adult and neonatal/paediatric patients), (3) a structured framework to categorise and understand the relationships among analysis approaches and their clinical roles, (4) consensus, unified terminology with clinical user-friendly definitions and explanations, (5) a review of all major work in thoracic EIT and (6) recommendations for future development (193 pages of online supplements systematically linked with the chief sections of the main document). We expect this information to be useful for clinicians and researchers working with EIT, as well as for industry producers of this technology.

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KEYWORDS:

ARDS; Assisted Ventilation; Imaging/CT MRI etc; Paediatric Lung Disaese

Select item 27199318 6.

[Br J Anaesth](#). 2016 Jun;116(6):862-9. doi: 10.1093/bja/aew116.

[Detection of optimal PEEP for equal distribution of tidal volume by volumetric capnography and electrical impedance tomography during decreasing levels of PEEP in post cardiac-surgery patients.](#)

[Blankman P](#)¹, [Shono A](#)¹, [Hermans BJ](#)², [Wesseliuss T](#)², [Hasan D](#)³, [Gommers D](#)⁴.

[Author information](#)

Abstract

BACKGROUND:

Homogeneous ventilation is important for prevention of ventilator-induced lung injury. Electrical impedance tomography (EIT) has been used to identify optimal PEEP by detection of homogenous ventilation in non-dependent and dependent lung regions. We aimed to compare the ability of volumetric capnography and EIT in detecting homogenous ventilation between these lung regions.

METHODS:

Fifteen mechanically-ventilated patients after cardiac surgery were studied. Ventilator settings were adjusted to volume-controlled mode with a fixed tidal volume (V_t) of 6-8 ml kg^{-1} predicted body weight. Different PEEP levels were applied (14 to 0 cm H₂O, in steps of 2 cm H₂O) and blood gases, V_{cap} and EIT were measured.

RESULTS:

Tidal impedance variation of the non-dependent region was highest at 6 cm H₂O PEEP, and decreased significantly at 14 cm H₂O PEEP indicating decrease in the fraction of V_t in this region. At 12 cm H₂O PEEP, homogenous ventilation was seen between both lung regions. Bohr and Enghoff dead space calculations decreased from a PEEP of 10 cm H₂O. Alveolar dead space divided by alveolar V_t decreased at PEEP levels ≤ 6 cm H₂O. The normalized slope of phase III significantly changed at PEEP levels ≤ 4 cm H₂O. Airway dead space was higher at higher PEEP levels and decreased at the lower PEEP levels.

CONCLUSIONS:

In postoperative cardiac patients, calculated dead space agreed well with EIT to detect the optimal PEEP for an equal distribution of inspired volume, amongst non-dependent and dependent lung regions. Airway dead space reduces at decreasing PEEP levels.

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KEYWORDS:

capnography; mechanical ventilation; peep; ventilator induced lung injury

Select item 26983857 7.

[Ann Intensive Care](#). 2016 Dec;6(1):22. doi: 10.1186/s13613-016-0124-x. Epub 2016 Mar 17.

[Long-term changes in dysnatremia incidence in the ICU: a shift from hyponatremia to hypernatremia.](#)

[Oude Lansink-Hartgring A¹](#), [Hessels L²](#), [Weigel J³](#), [de Smet AM²](#), [Gommers D³](#), [Panday PV⁴](#), [Hoorn EJ⁵](#), [Nijsten MW²](#).

[Author information](#)

Abstract

BACKGROUND:

Dysnatremia is associated with adverse outcome in critically ill patients. Changes in patients or treatment strategies may have affected the incidence of dysnatremia over time. We investigated long-term changes in the incidence of dysnatremia and analyzed its association with mortality.

METHODS:

Over a 21-year period (1992-2012), all serum sodium measurements were analyzed retrospectively in two university hospital ICUs, up to day 28 of ICU admission for the presence of dysnatremia. The study period was divided into five periods. All serum sodium measurements were collected from the electronic databases of both ICUs. Serum sodium was measured at the clinical chemistry departments using standard methods. All sodium measurements were categorized in the following categories: <120, 120-124, 125-129, 130-134, 135-139, 140-145, 146-150, 151-155, 156-160, >160 mmol/L. Mortality was determined at 90 days after ICU admission.

RESULTS:

In 80,571 ICU patients, 913,272 serum sodium measurements were analyzed. A striking shift in the pattern of ICU-acquired dysnatremias was observed: The incidence of hyponatremia almost halved (47-25 %, $p < 0.001$), whereas the incidence of hypernatremia nearly doubled (13-24 %, $p < 0.001$). Most hypernatremias developed after ICU admission, and the incidence of severe hypernatremia (sodium > 155 mmol/L) increased dramatically over the years. On ICU day 10 this incidence was 0.7 % in the 1992-1996 period, compared to 6.3 % in the 2009-2012 period ($p < 0.001$). More severe dysnatremia was associated with significantly higher mortality throughout the 21-year study period ($p < 0.001$).

CONCLUSIONS:

In two large Dutch cohorts, we observed a marked shift in the incidence of dysnatremia from hyponatremia to hypernatremia over two decades. As hypernatremia was mostly ICU acquired, this strongly suggests changes in treatment as underlying causes. This shift may be related to the increased use of sodium-containing infusions, diuretics, and hydrocortisone. As ICU-acquired hypernatremia is largely iatrogenic, it should be to an important extent preventable, and its incidence may be considered as an indicator of quality of care. Strategies to prevent hypernatremia deserve more emphasis; therefore,

we recommend that further study should be focused on interventions to prevent the occurrence of dysnatremias during ICU stay.

KEYWORDS:

Critical care; Dysnatremia; Hypernatremia; Hyponatremia; Incidence; Infusion; Sodium

Select item 26266910 8.

[Intensive Care Med Exp.](#) 2014 Dec;2(1):14. doi: 10.1186/2197-425X-2-14. Epub 2014 Apr 16.

[Assessment of ventilation inhomogeneity during mechanical ventilation using a rapid-response oxygen sensor-based oxygen washout method.](#)

[Bikker IG](#)¹, [Holland W](#), [Specht P](#), [Ince C](#), [Gommers D](#).

[Author information](#)

Abstract

PURPOSE:

Ventilatory inhomogeneity indexes in critically ill mechanically ventilated patients could be of importance to optimize ventilator settings in order to reduce additional lung injury. The present study compared six inhomogeneity indexes calculated from the oxygen washout curves provided by the rapid oxygen sensor of the LUFU end-expiratory lung volume measurement system.

METHODS:

Inhomogeneity was tested in a porcine model before and after induction of acute lung injury (ALI) at four different levels of positive end-expiratory pressure (PEEP; 15, 10, 5 and 0 cm H₂O). The following indexes were assessed: lung clearance index (LCI), mixing ratio, Becklake index, multiple breath alveolar mixing inefficiency, moment ratio and pulmonary clearance delay.

RESULTS:

LCI, mixing ratio, Becklake index and moment ratio were comparable with previous reported values and showed acceptable variation coefficients at baseline with and without ALI. Moment ratio had the highest precision, as calculated by the variation coefficients. LCI, Becklake index and moment ratio showed comparable increases in inhomogeneity during decremental PEEP steps before and after ALI.

CONCLUSIONS:

The advantage of the method we introduce is the combined measurement of end-expiratory lung volume (EELV) and inhomogeneity of lung ventilation with the LUFU fast-response medical-grade oxygen sensor, without the need for

external tracer gases. This can be combined with conventional breathing systems. The moment ratio and LCI index appeared to be the most favourable for integration with oxygen washout curves as judged by high precision and agreement with previous reported findings. Studies are under way to evaluate the indexes in critically ill patients.

Select item 26192561 9.

[Acta Anaesthesiol Scand.](#) 2016 Jan;60(1):69-78. doi: 10.1111/aas.12589. Epub 2015 Jul 20.

[Lung stress and strain calculations in mechanically ventilated patients in the intensive care unit.](#)

[Blankman P](#)¹, [Hasan D](#)¹, [Bikker IG](#)¹, [Gommers D](#)¹.

[Author information](#)

Abstract

BACKGROUND:

Stress and strain are parameters to describe respiratory mechanics during mechanical ventilation. Calculations of stress require invasive and difficult to perform esophageal pressure measurements. The hypothesis of the present study was: Can lung stress be reliably calculated based on non-invasive lung volume measurements, during a decremental Positive end-expiratory pressure (PEEP) trial in mechanically ventilated patients with different diseases?

METHODS:

Data of 26 pressure-controlled ventilated patients admitted to the ICU with different lung conditions were retrospectively analyzed: 11 coronary artery bypass graft (CABG), 9 neurology, and 6 lung disorders. During a decremental PEEP trial (from 15 to 0 cmH₂O in three steps) end-expiratory lung volume (EELV) measurements were performed at each PEEP step, without interruption of mechanical ventilation. Strain, specific elastance, and stress were calculated for each PEEP level. Elastance was calculated as delta PEEP divided by delta PEEP volume, whereas specific elastance is elastance times the FRC. Stress was calculated as specific elastance times the strain. Global strain was divided into dynamic (tidal volume) and static (PEEP) strain.

RESULTS:

Strain calculations based on FRC showed mainly changes in static component, whereas calculations based on EELV showed changes in both the static and dynamic component of strain. Stress calculated from EELV measurements was 24.0 ± 2.7 and 13.1 ± 3.8 cmH₂O in the lung disorder group at 15 and 5 cmH₂O PEEP. For the normal lungs, the stress values were 19.2 ± 3.2 and 10.9 ± 3.3 cmH₂O, respectively. These values are comparable to earlier publications. Specific elastance calculations were comparable in patients with neurologic and

lung disorders, and lower in the CABG group due to recruitment in this latter group.

CONCLUSION:

Stress and strain can reliably be calculated at the bedside based on non-invasive EELV measurements during a decremental PEEP trial in patients with different diseases.

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Select item 26154407 10.

[Intensive Care Med.](#) 2016 Jan;42(1):111-2. doi: 10.1007/s00134-015-3936-5. Epub 2015 Jul 8.

[PET-CT for detecting the undetected in the ICU.](#)

[Akin S¹](#), [den Uil CA²](#), [Groeninx van Zoelen CE²](#), [Gommers D²](#).

[Author information](#)

Select item 24887391 11.

[Crit Care.](#) 2014 May 10;18(3):R95. doi: 10.1186/cc13866.

[Detection of 'best' positive end-expiratory pressure derived from electrical impedance tomography parameters during a decremental positive end-expiratory pressure trial.](#)

[Blankman P](#), [Hasan D](#), [Erik G](#), [Gommers D](#).

Abstract

INTRODUCTION:

This study compares different parameters derived from electrical impedance tomography (EIT) data to define 'best' positive end-expiratory pressure (PEEP) during a decremental PEEP trial in mechanically-ventilated patients. 'Best' PEEP is regarded as minimal lung collapse and overdistention in order to prevent ventilator-induced lung injury.

METHODS:

A decremental PEEP trial (from 15 to 0 cm H₂O PEEP in 4 steps) was performed in 12 post-cardiac surgery patients on the ICU. At each PEEP step, EIT measurements were performed and from this data the following were calculated: tidal impedance variation (TIV), regional compliance, ventilation

surface area (VSA), center of ventilation (COV), regional ventilation delay (RVD index), global inhomogeneity (GI index), and intratidal gas distribution. From the latter parameter we developed the ITV index as a new homogeneity parameter. The EIT parameters were compared with dynamic compliance and the PaO₂/FiO₂ ratio.

RESULTS:

Dynamic compliance and the PaO₂/FiO₂ ratio had the highest value at 10 and 15 cm H₂O PEEP, respectively. TIV, regional compliance and VSA had a maximum value at 5 cm H₂O PEEP for the non-dependent lung region and a maximal value at 15 cm H₂O PEEP for the dependent lung region. GI index showed the lowest value at 10 cm H₂O PEEP, whereas for COV and the RVD index this was at 15 cm H₂O PEEP. The intratidal gas distribution showed an equal contribution of both lung regions at a specific PEEP level in each patient.

CONCLUSION:

In post-cardiac surgery patients, the ITV index was comparable with dynamic compliance to indicate 'best' PEEP. The ITV index can visualize the PEEP level at which ventilation of the non-dependent region is diminished, indicating overdistention. Additional studies should test whether application of this specific PEEP level leads to better outcome and also confirm these results in patients with acute respiratory distress syndrome.

Comment in

- [Methodology of electrical impedance tomography-derived measures of regional lung ventilation.](#) [Crit Care. 2014]
[Publication Types, MeSH Terms](#)

Select item 24739269 12.

[Curr Opin Crit Care.](#) 2014 Jun;20(3):347-51. doi:
10.1097/MCC.0000000000000099.

[Functional residual capacity and absolute lung volume.](#)

[Gommers D¹.](#)

[Author information](#)

Abstract

PURPOSE OF REVIEW:

To discuss the role of measuring functional residual capacity (FRC) during mechanical ventilation to improve patient ventilator settings in order to prevent ventilator-induced lung injury.

RECENT FINDINGS:

Nowadays, FRC can be measured without the use of tracer gases and without disconnection from the ventilator. It is shown that FRC can provide additional information to optimize the ventilator setting; for example, FRC measurements can differentiate between responders and nonresponders after a recruitment maneuver, and in combination with dynamic compliance one can differentiate between recruitment and overdistention during a positive end-expiratory pressure trial. In addition, FRC measurements enable not only to estimate stress and strain at the bedside, but also to estimate ventilation inhomogeneity.

SUMMARY:

In conclusion, measuring FRC could be extremely valuable during mechanical ventilation, but clinical studies are needed to prove whether this technique will improve outcome.

Select item 25039666 13.

[Acta Anaesthesiol Scand.](#) 2014 Sep;58(8):997-1006. doi: 10.1111/aas.12367. Epub 2014 Jul 15.

[Tidal ventilation distribution during pressure-controlled ventilation and pressure support ventilation in post-cardiac surgery patients.](#)

[Blankman P](#), [VAN DER Kreeft SM](#), [Gommers D](#).

Author information

Abstract

BACKGROUND:

Inhomogeneous ventilation is an important contributor to ventilator-induced lung injury. Therefore, this study examines homogeneity of lung ventilation by means of electrical impedance tomography (EIT) measurements during pressure-controlled ventilation (PCV) and pressure support ventilation (PSV) using the same ventilation pressures.

METHODS:

Twenty mechanically ventilated patients were studied after cardiac surgery. On arrival at the intensive care unit, ventilation distribution was measured with EIT just above the diaphragm for 15 min. After awakening, PCV was switched to PSV and EIT measurements were again recorded.

RESULTS:

Tidal impedance variation, a measure of tidal volume, increased during PSV compared with PCV, despite using the same ventilation pressures ($P = 0.045$). The distribution of tidal ventilation to the dependent lung region was more

pronounced during PSV compared with PCV, especially during the first half of the inspiration. An even distribution of tidal ventilation between the dependent and non-dependent lung regions was seen during PCV at lower tidal volumes (<8 ml/kg) and PSV at higher tidal volumes (\geq 8 ml/kg). In addition, the distribution of tidal ventilation was predominantly distributed to the dependent lung during PSV at low tidal volumes.

CONCLUSION:

In post-cardiac surgery patients, PSV showed improved ventilation of the dependent lung region due to the contribution of the diaphragm activity, which is even more pronounced during lower assist levels.

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[Publication Types, MeSH Terms](#)

Select item 25955869 14.

[J Neurosurg.](#) 2015 Sep;123(3):743-7. doi: 10.3171/2014.10.JNS141197. Epub 2015 May 8.

[Ultrasonographic measured optic nerve sheath diameter as an accurate and quick monitor for changes in intracranial pressure.](#)

[Maissan IM](#)¹, [Dirven PJ](#)¹, [Haitsma IK](#)², [Hoeks SE](#)¹, [Gommers D](#)³, [Stolker RJ](#)¹.

[Author information](#)

Abstract

OBJECT:

Ultrasonographic measurement of the optic nerve sheath diameter (ONSD) is known to be an accurate monitor of elevated intracranial pressure (ICP). However, it is yet unknown whether fluctuations in ICP result in direct changes in ONSD. Therefore, the authors researched whether ONSD and ICP simultaneously change during tracheal manipulation in patients in the intensive care unit (ICU) who have suffered a traumatic brain injury (TBI).

MATERIALS:

The authors included 18 ICP-monitored patients who had sustained TBI and were admitted to the ICU. They examined the optic nerve sheath by performing ultrasound before, during, and after tracheal manipulation, which is known to increase ICP. The correlation between ONSD and ICP measurements was determined, and the diagnostic performance of ONSD measurement was tested using receiver operating characteristic curve analysis.

RESULTS:

In all patients ICP increased above 20 mm Hg during manipulation of the trachea, and this increase was directly associated with a dilation of the ONSD of > 5.0 mm. After tracheal manipulation stopped, ICP as well as ONSD decreased immediately to baseline levels. The correlation between ICP and ONSD was high ($R(2) = 0.80$); at a cutoff of ≥ 5.0 mm ONSD, a sensitivity of 94%, a specificity of 98%, and an area under the curve of 0.99 (95% CI 0.97-1.00) for detecting elevated ICP were determined.

CONCLUSIONS:

In patients who have sustained a TBI, ultrasonography of the ONSD is an accurate, simple, and rapid measurement for detecting elevated ICP as well as immediate changes in ICP. Therefore, it might be a useful tool to monitor ICP, especially in conditions in which invasive ICP monitoring is not available, such as at trauma scenes.

KEYWORDS:

ICP = intracranial pressure; ICU = intensive care unit; ONSD; ONSD = optic nerve sheath diameter; TBI = traumatic brain injury; TCD = transcranial Doppler; diagnostic and operative techniques; head trauma; intracranial pressure; neurotrauma; optic nerve sheath; trauma

Comment in

- [Letter to the Editor: Sensitivity and specificity levels reported in the TBI literature.](#) [J Neurosurg. 2016]
- [Optic nerve sheath diameter as ICP marker.](#) [J Neurosurg. 2016]
- [Response.](#) [J Neurosurg. 2016]
- J Neurosurg. 2016 Apr;124(4):1134.
[Publication Types, MeSH Terms](#)
-

Select item 24647360 15.

[Minerva Anesthesiol.](#) 2014 Nov;80(11):1169-77. Epub 2014 Mar 20.

[Experimental validation of frequently-used echocardiographic right-ventricular impedance parameters.](#)

[Reis Miranda D](#), [Marco Knook AH](#), [Paalvast F](#), [Rossi A](#), [Hop W](#), [Oei F](#), [Van Bommel J](#), [Gommers D](#).

[Author information](#)

Abstract

BACKGROUND:

Aim of the study was to validate commonly used bedside right-ventricular (RV) impedance parameters, which are utilized in determining heart-lung interactions during mechanical ventilation.

METHODS:

Fifteen pigs were equally assigned to either an open or a closed pericardium group. In all animals, an inflatable vascular occluder and a flow probe were placed around the main pulmonary artery, which allowed for a gradual increase in pulmonary vascular impedance with banding of the pulmonary artery. A median sternotomy was performed for the open pericardium group, and a lateral thoracotomy was performed for the closed pericardium group.

RESULTS:

In the open pericardium group, mean acceleration time (ACmean) and the slope of the pulmonary artery flow correlated significantly with Poiseuille resistance over the banding ($r=0.67$ and $r=0.65$, respectively). In the closed pericardium group, the ratio of the right to left ventricular area, eccentricity index, and tricuspid annular plane systolic excursion did not correlate with resistance over the banding, only the ACmean showed a significant correlation with resistance over the banding ($r=0.88$).

CONCLUSION:

ACmean is a reliable parameter of RV impedance that can be used to study the heart-lung interactions during mechanical ventilation.

[BMC Emerg Med.](#) 2016 Apr 6;16:17. doi: 10.1186/s12873-016-0081-6.

[Higher diagnostic accuracy and cost-effectiveness using procalcitonin in the treatment of emergency medicine patients with fever \(The HiTEMP study\): a multicenter randomized study.](#)

[van der Does Y¹](#), [Limper M²](#), [Schuit SC^{3,2}](#), [Poley MJ^{4,5}](#), [van Rosmalen J⁶](#), [Ramakers C⁷](#), [Patka P³](#), [van Gorp EC^{2,8}](#), [Rood PP³](#).

[Author information](#)

Abstract

BACKGROUND:

Fever is a common symptom in the emergency department(ED). Fever can be caused by bacterial infections, which are treated with antibiotics. Often, bacterial infections cannot be ruled out in the ED using standard diagnostics, and empiric antibiotic treatment is started. Procalcitonin(PCT) is a biomarker for bacterial infections, but its role in an undifferentiated ED population remains unclear. We hypothesize that PCT-guided therapy may reduce antibiotics prescription in undifferentiated febrile ED patients. The primary objectives of this study are to determine a) the efficacy, b) the safety of PCT-guided therapy, and

c) the accuracy of the biomarker PCT for bacterial infections. The secondary objective is to study the cost-effectiveness of PCT-guided therapy.

METHODS/DESIGN:

This is a multicenter noninferiority randomized controlled trial. All adult ED patients with fever (≥ 38.2 °C) are randomized between standard care with and without the addition of a PCT level, after written informed consent. a) For efficacy, the reduction of patients receiving antibiotics is calculated, using a superiority analysis: differences between the PCT-guided group and control group are assessed using a Fisher's exact test, and a multivariable logistic regression analysis to account for the effects of demographic and medical variables on the percentage of febrile patients receiving antibiotics. b) Safety consists of a composite endpoint, defined as mortality, intensive care admission and ED return visit within 14 days. Noninferiority of PCT will be tested using a one-sided 95 % confidence interval for the difference in the composite safety endpoint between the PCT-guided and control groups using a noninferiority margin of 7.5 %. c) Accuracy of PCT and CRP for the diagnosis of bacterial infections will be reported, using the sensitivity, specificity, and the area under the receiver-operating-characteristic curve in the definitive diagnosis of bacterial infections. The sample size is 550 patients, which was calculated using a power analysis for all primary objectives. Enrollment of patients started in August 2014 and will last 2 years.

DISCUSSION:

PCT may offer a more tailor-made treatment to the individual ED patient with fever. Prospective costs analyses will reveal the economic consequences of implementing PCT-guided therapy in the ED.

THIS TRIAL IS REGISTERED IN THE DUTCH TRIAL REGISTER:

NTR4949.

KEYWORDS:

Antibiotics; C-Reactive protein; Emergency medicine; Fever; Procalcitonin

Select item 24820656 2.

[J Infect.](#) 2014 Oct;69(4):410-2. doi: 10.1016/j.jinf.2014.04.009. Epub 2014 May 10.

[Procalcitonin guided antibiotic therapy in patients presenting with fever in the emergency department.](#)

[Limper M](#)¹, [van der Does Y](#)², [Brandjes DP](#)³, [De Kruif MD](#)⁴, [Rood PP](#)⁵, [van Gorp EC](#)⁶.

[Author information](#)

Comment on

- [Serial and panel analyses of biomarkers do not improve the prediction of bacteremia compared to one procalcitonin measurement.](#) [J Infect. 2012]

-

Select item 23688570 3.

[Am J Emerg Med.](#) 2013 Jul;31(7):1012-6. doi: 10.1016/j.ajem.2013.03.004. Epub 2013 May 18.

[Non-invasive blood pressure and cardiac index measurements using the FinapresPortapres in an emergency department triage setting.](#)

[van der Does Y¹](#), [van Loon LM](#), [Alisma J](#), [Govers A](#), [Lansdorp B](#), [Rood PP](#), [Schuit SC](#).

[Author information](#)

Abstract

Emergency department (ED) patients are triaged to determine the urgency of care. The FinapresPortapres (FP) measures blood pressure (BP) and cardiac output (CO) non-invasively, and may be of added value in early detection of patients at risk for hemodynamic compromise.

OBJECTIVES:

Compare non-invasive BP measurements using FP and standard automated sphygmomanometry. Compare FP cardiac index (CI), CO corrected for body surface area, of normotensive patients, to chart-based physician estimate of shock, to discover if there is additional value in CI measurements in triage.

METHODS:

ED Patients requiring BP measurement in triage were included. Systolic (SBP) and diastolic (DBP) BP were measured using both devices during a two minutes measurement. Two physicians independently judged probability of shock, defined as estimated CI ≤ 2.5 L min⁽⁻¹⁾ m⁽⁻²⁾, based on chart review, three weeks after ED visit.

RESULTS:

Of a total of 112 patients 97 patients were included. Pearson's correlation coefficient was 0.50 for SBP, 0.53 for DBP, with a Blant-Altman mean bias of 11.3 (upper limit 65.3, lower limit -42.8) and 7.7 (39.2, -23.7) for SBP and DBP respectively. In normotensive patients, the group with low FP CI measurements had significantly more cases with physician-estimated shock, compared to the normal to high measurements (P = .036).

CONCLUSIONS:

When used as a triage device in the emergency department setting, non-invasive BP measurements using FP do not correlate well with automated sphygmomanometry. However, this study does indicate that use of the FP

device in triage may aid physicians to recognize patients in early phases of shock.

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Select item 27130585 4.

[Am J Emerg Med.](#) 2016 Jul;34(7):1286-93. doi: 10.1016/j.ajem.2016.03.065. Epub 2016 Apr 3.

[Procalcitonin-guided therapy for the initiation of antibiotics in the ED: a systematic review.](#)

[van der Does Y¹](#), [Rood PP²](#), [Haagsma JA³](#), [Patka P⁴](#), [van Gorp EC⁵](#), [Limper M⁶](#).

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Abstract

BACKGROUND:

Procalcitonin (PCT) is a new biomarker with a higher accuracy in the diagnosis of bacterial infections. Utilization of PCT may reduce the number of unnecessary antibiotics prescribed to patients and consequently may decrease the rise in antibiotic resistance. The aim of this systematic review is to determine if a PCT-guided algorithm can safely reduce the number of antibiotics prescribed to all patients with a suspected of infection in the emergency department (ED).

METHODS:

MEDLINE, EMBASE, Web of Science, COCHRANE central, PubMed publisher, and Google scholar were searched. Two reviewers performed the screening independently. The QUADAS 2 tool was used to assess quality.

RESULTS:

In total, 1621 articles were screened. Nine articles were included in the analysis. In the 6 studies on adult patients, only patients with respiratory tract infections were investigated. In these studies, a cutoff value of 0.25 µg/L was used, and PCT-guided therapy reduced the number of prescribed antibiotics significantly. Three studies were on pediatric patients, 2 on fever without source and 1 on respiratory complaints. Procalcitonin-guided therapy did not reduce antibiotic prescription in children. Procalcitonin-guided therapy did not result in an increase in adverse events in any of the studies.

DISCUSSION:

Procalcitonin-guided therapy in the ED is only studied in subpopulations, where it was effective and safe in adult patients with respiratory tract infections and not effective but safe nonetheless in specific pediatric populations. Nonadherence

is a significant problem in prospective PCT-guided therapy studies. There is not enough evidence to use PCT-guided therapy in a general ED population.

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Select item 26997637 5.

[J Infect.](#) 2016 Jun;72(6):761-3. doi: 10.1016/j.jinf.2016.03.004. Epub 2016 Mar 18.

[TRAIL and IP-10 as biomarkers of viral infections in the emergency department.](#)

[van der Does Y¹](#), [Tijkhoeri A²](#), [Ramakers C³](#), [Rood PP⁴](#), [van Gorp EC⁵](#), [Limper M⁶](#).

[Author information](#)

[Publication Types](#)

Select item 24613498 6.

[J ClinEpidemiol.](#) 2014 Jun;67(6):635-44. doi: 10.1016/j.jclinepi.2013.12.005. Epub 2014 Mar 5.

[Justification of exclusion criteria was underreported in a review of cardiovascular trials.](#)

[Schmidt AF¹](#), [Groenwold RH²](#), [van Delden JJ³](#), [van der Does Y⁴](#), [Klungel OH²](#), [Roes KC³](#), [Hoes AW³](#), [van der Graaf R³](#).

[Author information](#)

Abstract

OBJECTIVES:

Ethical guidelines for human subject research require that the burdens and benefits of participation be equally distributed. This study aimed to provide empirical data on exclusion of trial participants and reasons for this exclusion. As a secondary objective, we assessed to what extent exclusion affects generalizability of study results.

STUDY DESIGN AND SETTING:

Review of trials on secondary prevention of cardiovascular events.

RESULTS:

One hundred thirteen trials were identified, of which 112 reported exclusion criteria. One study justified the exclusion criteria applied. Ambiguous exclusion criteria due to the opinion of the physician (28 of 112 = 25%) or physical disability (12 of 112 = 11%) were reported. Within groups of trials that studied similar treatments (ie, beta-blocker, clopidogrel, or statin therapy), baseline

characteristics differed among trials. For example, the proportion of women ranged between 23.1-47.4%, 2.1-38.9%, and 10.6-50.6% for the clopidogrel, beta-blocker, and statin trials, respectively. Nevertheless, no evidence was found for heterogeneity of treatment effects.

CONCLUSION:

Almost none of the articles justified the applied exclusion criteria. No evidence was found that inclusion of dissimilar participants affected generalizability. To allow for a normative discussion on equitable selection of study populations, researchers should not only report exclusion criteria but also the reasons for using these criteria.

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KEYWORDS:

Ethics; Exclusion criteria; Generalizability; Human experimentation; Medical; Randomized controlled trials; Research