

1st International Fluid Academy Day
November 19, 2011, Elzenveld Congress and Convention Centre, Antwerp, Belgium

PART 1: MORNING SESSIONS

SESSION 1: Give Fluids? Make it Choice, not Chance

Chair: Rainer Gatz and Peter Rogiers

- | | |
|---------------|---|
| 9:00 - 9:20 | Introduction and basic concepts of fluid therapy
<i>Niels Van Regenmortel</i> |
| 9:20 - 9:40 | Stewart says: saline sucks! The trouble with hyperchloremic metabolic acidosis
<i>Paul Elbers</i> |
| 9:40 - 10:00 | The clash of the titans: crystalloids versus colloids?
<i>Eric Hoste</i> |
| 10:00 - 10:20 | Some colloids are more equal than others: does our choice matter?
<i>Sibylle Kozek-Langenecker</i> |
| 10:20 - 10:35 | Discussion |

CHAIRPERSONS

Rainer Gatz

Rainer Gatz is an anaesthesiologist working full-time in intensive care at Herlev Hospital, one of university level hospitals of the Copenhagen metropolitan area in Denmark.

He has a longstanding special interest in emergency and intensive care medicine echography and in acid-base analysis based on the physicochemical approach popularised by Peter Stewart.



He is closely collaborating with Paul Elbers in acid-base matters, being responsible for developing the analysis and database module on the acidbase.org website owned by Paul.

Peter Rogiers

Education:

- 1967-1972: primary school (OLVE, Edegem)
- 1973-1979: secondary school (OLVE, Edegem)
- 1980-1986: Doctor in medicine at the University of Antwerp (UIA), with great distinction
- 1987-1991: postgraduate training for internal medicine at the University of Antwerp
- 1992: postgraduate training for intensive care medicine at the Erasme Hospital (free University of Brussels, ULB)



Professional experience:

- 1993- : full time intensivist at the medical intensive care unit of the Middelheim General Hospital of Antwerp
- Active collaborator in the research team of professor J-L Vincent at the Erasme hospital, Free University of Brussels (ULB)
- Preparation of PhD thesis at the Erasme hospital, Free University of Brussels (ULB)

Winner of the 'Young Investigators award' of the Belgian Society of Intensive Care Medicine (SIZ).
P Rogiers. Role of extra-corporeal therapies in experimental septic shock.

1. Introduction and basic concepts of fluid therapy

After a warm welcome to the symposium, the most important characteristics of fluid solutions will be explained: tonicity of fluids, is it the same as osmolality, what is the strong ion difference, what are the different types of colloids, what is oncoticity?

Niels Van Regenmortel

2001 MD, Antwerp University
2006 Board certified Internal Medicine
2007 Board certified Intensive Care Medicine
2007 Staff member Intensive Care Department – ZNA Stuivenberg – Antwerp, Belgium
2009 Lecturer of the course “Biomedical and nursing approach of metabolic disturbances” in the Bachelor after bachelor programme Nursing in Intensive Care and Emergency Care – Artesis University, Antwerp, Belgium



Niels Van Regenmortel (°1976) is an internist-intensivist, working on the 12 bed medical intensive care unit of the Stuivenberg Hospital in Antwerp. His special interest lies in acid-base analysis and the effects of fluid management on the human acid-base status. He is a strong advocate of the physicochemical explanation of these effects, introduced by Peter Stewart, and of the deleterious effects of fluid overload. He regularly gives local and international lectures about this topic. Another important interest is the correct in-hospital use of antibiotics. He resides in Edegem, Antwerp with his wife and two children.

Further Reading

1. Guyton & Hall (1996). Textbook of Medical Physiology. 9th Ed. Philadelphia: Elsevier Saunders
2. The GIFTASUP Guidelines. http://www.bapen.org.uk/pdfs/bapen_pubs/giftasup.pdf
3. Kellum JA. Clinical review: reunification of acid-base physiology. Crit Care. 2005 Oct 5;9(5):500-7.

2. Stewart says: saline sucks! The trouble with hyperchloremic metabolic acidosis

There is much ado about hyperchloremic metabolic acidosis caused by fluids. Where does it come from? Is it relevant, is there any animal or human data supporting this statement? How can it be avoided? Is the use of saline still acceptable, because there may be nothing "normal" about "normal saline"?

Paul Elbers

Paul WG Elbers, MD, PhD (1975) is an intensivist and cardiac anesthesiologist affiliated with Medical Center Leeuwarden, The Netherlands and Onze Lieve Vrouwe Gasthuis, Amsterdam, The Netherlands. Special interests include quantitative acid base analysis, fluid therapy, ultrasound, pharmacokinetics, medical information technology, and the human microcirculation. The latter was the topic of his PhD thesis entitled "Focus on Flow, Imaging the Human Microcirculation in Perioperative and Intensive Care Medicine". Together with Prof. John A Kellum he edited the second edition of "Stewart's Textbook of Acid-Base". Together with Rainer Gatz, MD, he is the editor of www.acidbase.org, an online community for quantitative acid base analysis including clinical decision support tools. He resides in Amsterdam, The Netherlands.



Further Reading:

1. Stewart's Textbook of Acid-Base; Kellum J Elbers P; ISBN-13: 978-1409254706
2. Kellum JA. Saline-induced hyperchloremic metabolic acidosis; Crit Care Med. 2002
3. <http://www.acidbase.org/>

3. The clash of the titans: crystalloids versus colloids?

The never-ending debate: where are we now? Is there merely a difference in cosmetics or also in outcome? What are the flaws of the actual mega-trials and meta-analyses? Are there specific situations or patient groups where colloids behave differently and may have an advantage? Which trials are in the pipeline?

Eric Hoste

Training

- Doctor in Medicine, Surgery, and Obstetrics, Ghent University, Belgium 1989.
- Board Certified: Internal Medicine, October 1995.
- Board Certified: Intensive Care Medicine 1997.
- PhD Doctorate in the Medical Sciences, 30th November 2004 titled "Acute Renal Failure in Critically Ill Patients".

Prizes

- Best oral communication SIZ (Belgian Society of Intensive Care Medicine) spring meeting, Charleroi, Belgium, 2002
- Best oral communication SIZ (Belgian Society of Intensive Care Medicine) spring meeting, Brussels, Belgium, 2003
- EDTNA/ERCA, Geneva, September 5th 2004.
- SIZ (Belgian Society of Intensive Care Medicine) award for the year 2005.
- 2011 ECCRN/ESICM Clinical Research Award. Berlin, Germany (3-5 Oct 2011)

Working career

- Chief of Clinic, Intensive Care Unit, Ghent University Hospital, Belgium
- Research fellow in Critical Care Medicine, The CRISMA laboratory, Department of Critical Care Medicine, University of Pittsburgh School of Medicine, August-December 2003.
- Professor in the rank of senior lecturer appointment to the Ghent University, Faculty of Medicine and Health Sciences.
- Senior Clinical Investigator of the Research Foundation-Flanders (FWO).
- Member and scout for the ISN/Renal Disaster Relief task Force
- Deputy of the Acute Kidney Injury Section of the European Society of Intensive Care Medicine (ESICM)
- Member of the ESICM European Critical Care Research Network (ECCRN)
- President of the Belgian Society of Intensive Care Medicine (SIZ)
- Research interest: clinical critical care nephrology.

Publications

Author and co-author of 104 publications in peer reviewed journals and 20 book chapters.

Further reading

1. Colloids versus crystalloids for fluid resuscitation in critically ill patients, [Cochrane Database Syst Rev](#).hrane Database Syst Rev. 2011 Mar 16;(3):CD000567



4. Some colloids are more equal than others: does our choice matter?

Many controversies will be dealt with regard the different colloids. Gelatins or Starches? Are the smaller starches safer? Does the buffer solution in balanced solutions (lactate, acetate,...) matter? Is the origin of the starch (maize versus potatoes) important? Do we still have to fear for the kidneys and the coagulation with the newest starches? Should we bother about anaphylactic reactions or prior disease when using gelatins?

Sibylle Kozek-Langenecker

Title: MD Professor MBA

Position: Chairperson, Department of Anaesthesiology and Intensive Care at the Evangelic Hospital Vienna, Hans



After completing her medical studies at the University of Vienna in 1991, she was trained at the Department of Anaesthesiology, General Intensive Care and Pain Management at the Vienna Medical University, Austria. She became Professor in Anaesthesiology in 2000 and Chairwoman of the Department of Anaesthesiology and Intensive Care at the Evangelic Hospital Vienna, Austria in 2008. Dr. Kozek-Langenecker is president of the Austrian Society of Anaesthesiology (ÖGARI) 2011-2013, member of the Austrian Task Force on Perioperative Bleeding Management of the ÖGARI, and chairperson of Subcommittee 6, Transfusion & Haemostasis, of the European Society of Anaesthesiologists (ESA) 2010-2012. Her major research interests are perioperative bleeding management and postoperative pain. In 2009 she launched an innovative multi-media e-learning platform www.perioperativebleeding.org including modules with European CME accreditation. Dr. Kozek-Langenecker wrote more than 90 articles and 30 chapters in national and international textbooks. She is currently member of the editorial board for Anesthesiology Research & Practice, Section Transfusion and AINS.

Further reading

1. Kozek-Langenecker SA et al. The effects of hydroxyethyl starch 130/0.4 (6%) on blood loss and use of blood products in major surgery: a pooled analysis of randomized clinical trials., *Anesth Analg.* 2008 Aug;107(2):382-902.
2. www.perioperativebleeding.org

PART 1: MORNING SESSIONS

SESSION 1: Give Fluids? Make it Choice, not Chance

Chair: Philippe Jorens and Eric Hoste

- | | |
|---------------|--|
| 11:00 - 11:20 | The hypertonics: lessons from massive fluid administration for small volume therapy
<i>Dirk Himpe</i> |
| 11:20 - 11:40 | Hero or has-been: is there still a place for albumin?
<i>Julia Wendon</i> |
| 11:40 - 12:00 | Pushing the boundaries: what's beyond the final frontier?
<i>Can Ince</i> |
| 12:00 - 12:15 | Discussion |

CHAIRPERSONS

Eric Hoste

Bio profile: See above



Philippe Jorens

Chairman department of critical care medicine, Antwerp University Hospital, University of Antwerp. Full professor in critical care medicine
Professor, Faculty of Medicine (100%)
University: Undergraduate: medicine, Bachelor 15.07.1993
University of Antwerp, RUCA, high distinction

Graduate: medicine, Master (MD) 10.07.1987.
University of Antwerp, UIA, high distinction

University of Antwerp (UA), UIA (Ph D degree)
Lecture: The role of nitric oxide synthase II, 24.05.1993.
Ph.D. thesis: Nitric oxide and interleukin-8: two mediators released by pulmonary macrophages, 07.09.1993.
Lecture: The role of glucocorticoids in respiratory medicine.21.09.93

Additional Certificates:

1990: Leiden, Boerhaave cycle: cell- and tissue culture
1994: Innsbruck, European Diploma in Intensive Care Medicine, written part
1994: Ghent, European Diploma in Intensive Care Medicine, oral part
1997: Tilburg, Advanced Trauma Life Support (Am College of Surgeons)
2004: Mechelen, Principles of ICH-GCP and Clinical Research
2004: Clinical Pharmacologist (Dutch Society of Clinical Pharmacology and Biopharmacy)
2006 Vlerick Management School. General management for the hospital doctor
2008: Advanced neuro ICU management (Hamburg – Germany)

Career, Positions:

01.05.1994: Staff member, Department of Critical Care Medicine, Antwerp University Hospital.
01.01.2000: Associate Professor (10%), Department of Critical Care Medicine, University of Antwerp
01.10.2000: Associate Professor (60%), Clinical Pharmacology and Pharmacotherapy / Toxicology, University of Antwerp
01.02.2001: Vice-Chairman (60%), Department of Critical Care Medicine, Antwerp University Hospital
01.04.2003: Full Professor (60%), Clinical Pharmacology and Pharmacotherapy / Toxicology / University of Antwerp
01.10.2008: Chairman department of critical care medicine, Antwerp University Hospital, University of Antwerp. Full professor in critical care medicine
01.01.2010: Professor, Faculty of Medicine (100%)



5. The hypertonics: lessons from massive fluid administration for small volume therapy

Are hypertonic solutions of any use? What are the possible mechanisms of action? What are the indications for small volume resuscitation? What is the dose? Are there relevant side-effects?

Dirk Himpe

Present Rank : Staff Anesthesiologist
Department : Anaesthesia
Institution : ZNA Middelheim General Hospital Antwerp Belgium

Medical School: Catholic University Louvain (KUL) 1971 - 1978
Doctor in de Genees - , Heel - & Verloskunde (MD awarded) 1978
Post - graduate qualifications:
Board - certified Specialist in Anaesthesiology 1982
European Diploma Intensive Care Medicine (EDIC awarded) 1991
Board - certified Intensive Care Specialist 1998
Doctoral Thesis:
Faculty of Medicine University of Antwerp (UA):
Doctor in de Medische Wetenschappen (PhD awarded) 2004
Economics & Management:
Vlekho Business School Brussels:
Getuigschrift Master in Gezondheidseconomie (MHE awarded) 2005



Further Reading

1. Himpe D. Colloids versus crystalloids as priming solutions for cardiopulmonary bypass: a meta-analysis of prospective, randomised clinical trials. *Acta Anaesthesiol Belg.* 2003;54(3):207-15.
2. McAlister V, Burns KE, Znajda T, Church B. Hypertonic saline for peri-operative fluid management. *Cochrane Database Syst Rev.* 2010 Jan 20;(1):CD005576. Review.
3. Mortazavi MM, Romeo AK, Deep A, Griessenauer CJ, Shoja MM, Tubbs RS, Fisher W. Hypertonic saline for treating raised intracranial pressure: literature review with meta-analysis. *J Neurosurg.* 2011 Sep 23.
4. Kamel H, Navi BB, Nakagawa K, Hemphill JC 3rd, Ko NU. Hypertonic saline versus mannitol for the treatment of elevated intracranial pressure: a meta-analysis of randomized clinical trials. *Crit Care Med.* 2011 Mar;39(3):554-9.

6. Hero or has-been: is there still a place for albumin?

It's expensive (at least in Europe), but is it also worth the cash? Is it human or do we just hope it is? Are there still indications for iso (or even hypo)-oncotic albumine? Is there an advantage of the hyperoncotic formulation to mobilize fluids? Do the kidneys like this strategy? Do we still have to measure plasma levels of albumin and is a correction of a low level necessary?

Julia Wendon

POSITION TITLE:

Lead clinician for liver ITU
Senior lecturer / Hon Consultant

EDUCATION/TRAINING

1982
University of Dundee
Degree: MbChB FRCP

Interests:

Acute liver failure, critically ill cirrhosis
Employment : 1992 – present time : Sen lecturer and Hon consultant in Hepatology and Intensive Care Medicine
Examiner for ALS, ATLS, ESICM, DICM.



Further Reading

1. SAFE Study Investigators, Finfer S, McEvoy S, Bellomo R, McArthur C, Myburgh J, Norton R. Impact of albumin compared to saline on organ function and mortality of patients with severe sepsis. *Intensive Care Med.* 2011 Jan;37(1):86-96.
2. Albumin Reviewers (Alderson P, Bunn F, Li Wan Po A, Li L, Blackhall K, Roberts I, Schierhout G). Human albumin solution for resuscitation and volume expansion in critically ill patients. *Cochrane Database Syst Rev.* 2011 Oct 5;(10):CD001208. Review.
3. Delaney AP, Dan A, McCaffrey J, Finfer S. The role of albumin as a resuscitation fluid for patients with sepsis: a systematic review and meta-analysis. *Crit Care Med.* 2011 Feb;39(2):386-91.
4. Jacob M, Chappell D, Conzen P, Wilkes MM, Becker BF, Rehm M. Small-volume resuscitation with hyperoncotic albumin: a systematic review of randomized clinical trials. *Crit Care.* 2008;12(2):R34. Epub 2008 Mar 4. Review.

7. Pushing the boundaries: what's beyond the final frontier?

The fluid therapy of the future! Do the newer fluids have additional properties beyond correcting volume deficits? Can they avoid or even treat capillary leak with a so-called sealing effect? Are there relevant anti-inflammatory effects? Do we have to shift our attention from the macro- to the microcirculation? Maybe it is time to resuscitate the microcirculation: open the microcirculation and keep it open!

Can Ince

Professor Dr. Can Ince is a physiologist who heads the Department of Translational Physiology at the Academic Medical Center (AMC) of the University of Amsterdam. In addition Professor Ince is a part-time staff member (40%) of the Department of Intensive Care of the Erasmus Medical Center Rotterdam (head Prof. Jan Bakker). Together with his team he conducts both experimental and clinical research directed at cardiovascular aspects of peri-operative medicine. Research topics include clinical microcirculation research in intensive care, cardiothoracic surgery and anesthesiology, blood transfusion, fluid resuscitation, sepsis, shock and resuscitation, acute renal failure, oxygen transport to tissue and mitochondrial function. In addition the experimental and clinical medical technology research related to the afore mentioned topics is carried out. Prior to his current position he was professor of Experimental Anesthesiology at the Dept of Anesthesiology as well as Prof of Cell Physiology at the AMC. Before going to the AMC (1993) he was associate professor at the University Hospital of Rotterdam at the Intensive Care Unit of the Dept of General Surgery (head prof. HA Bruining). Prior to that he had worked at the Dept. of Infectious Diseases (University Hospital Leiden) for some ten years on immunological research. He has a PhD degree in Immunology/Cell physiology from that University as well as degrees in electrical and electronic engineering (BSc University of Birmingham (UK), MSc Information Theory Technical University of Delft (Netherlands). Prof. Ince is past-president of the Dutch Physiological Society, former chairman of the Scientific Committee of the Netherlands Society for Intensive Care Medicine and past-president of the International Society of Oxygen Transport to Tissue. He is member of the Hemodynamics Working Group and of the Medical Technology Assessment Working group of the European Society for Intensive Care Medicine. He is on the editorial boards of several journals and has organized several international conference the latest of which is the 2011 Functional Hemodynamics and Fluid Therapy International Symposium in Istanbul Turkey (see www.microcirculationresearch.org/istanbul). He has authored close to 300 scientific peer reviewed papers.



Further reading

1. Human Anatomy and Physiology ,8th edn, Benjamin-Cummings ISBN-13: 978-0805395693
2. Ince C et al. Microcirculatory oxygenation and shunting in sepsis and shock. *Crit Care Med* 1999;27:1369–77
3. Dubin A, et al. Comparison of 6% hydroxyethyl starch 130/0.4 and saline solution for resuscitation of the microcirculation during the early goal-directed therapy of septic patients. *J Crit Care.* 2010 Dec;25(4):659.

PART 2: AFTERNOON SESSIONS

SESSION 3: Give Fluids? Avoid Floods!

Chair: Julia Wendon and Alexander Wilmer

- | | |
|---------------|--|
| 13:10 - 13:30 | Fluid overload: poor cosmetics or bad medicine?
<i>Manu Malbrain</i> |
| 13:30 - 13:50 | Assessment of fluid therapy: use the right tool for the right job!
<i>Xavier Monnet</i> |
| 13:50 - 14:10 | Perioperative fluid optimisation: from gut feeling to closed loops?
<i>Frederic Michard</i> |
| 14:10 - 14:30 | Frank Starling revisited: the importance of fluid responsiveness
<i>Jean-Louis Vincent</i> |
| 14:30 - 14:50 | The search for the Holy Grail continues: is there a place for lactate?
<i>Jan Bakker</i> |
| 14:50 - 15:05 | Discussion |

CHAIRPERSONS

Julia Wendon

Bio profile: see morning sessions



Alexander Wilmer

Current position

Head of Clinic - Department of General Internal Medicine
Medical Intensive Care Unit - UZ Gasthuisberg - Leuven

Associate professor - Department of Pathophysiology
Faculty of Medicine - Katholieke Universiteit Leuven

Memberships

Nederlandstalige Erkenningscommissie Intensieve Zorgen Koninkrijk België
Member Bestuurscomité Belgische Vereniging voor Intensieve Zorgen
Member European Society of Intensive Care Medicine

Publications

Search pubmed for "wilmer a"

Particular interests in ICU:

Liver pathology, weaning, nutrition

Training:

Undergraduate studies (BS): Hampden-Sydney College, Virginia, USA

Graduate studies (MA + PhD): Ludwig-Maximilians Universität München, Germany

Clinical training (Internal Medicine and Intensive Care): UZ Leuven, Katholieke Universiteit Leuven, Belgium



8. Fluid overload: poor cosmetics or bad medicine?

Edema and derailed cumulative fluid balances: are they just collateral damage or do they put the patient in additional danger? Restrictive versus liberal fluid strategies? Is there an additional effect of early removal of fluids or should we go from early adequate over late conservative fluid management towards late goal directed fluid removal? What is the Ebb and Flow phase of shock? Is anasarca edema just of cosmetic concern or is it harmful for the organs and eventually the patient? Maybe we need to rethink the 2 hit ischemia-reperfusion model and replace it by a 3 hit model, where unresolved shock will lead to the third hit, the global increased permeability syndrome? Capillary leak is an inflammatory condition with diverse triggers that results from a common pathway that includes ischemia-reperfusion, toxic oxygen metabolite generation, cell wall and enzyme injury leading to a loss of capillary endothelial barrier function. In such a state, plasma volume expansion to correct hypoperfusion predictably results in extravascular movement of water, electrolytes and proteins. Peripheral tissue edema, visceral edema and ascites may be anticipated in proportion to the volume of prescribed resuscitation fluid. A variety of strategies are available to the clinician to reduce the volume of crystalloid resuscitation utilized while restoring macro- and microcirculatory flow. Regardless of the resuscitation strategy, the clinician must maintain a heightened awareness of the dynamic relationship between capillary leak, fluid loading, peripheral edema, intra-abdominal hypertension and the abdominal compartment syndrome and the potential need and beneficial effect of de-resuscitation.

Manu Malbrain

ICU and High Care Burn Unit Director, Ziekenhuis Netwerk Antwerpen, ZNA Stuivenberg

Manu Malbrain (1965) qualified as MD from the Catholic University of Leuven, Belgium in 1991. He is married to Bieke Depré and they have 3 sons: Jacco, Milan and Luca. He is the manager and director of the Medical ICU (Medisch Intensieve Therapie Eenheid – MITE, 12 ICU beds), the Surgical ICU (Chirurgisch Intensieve Therapie Eenheid – ITE, 12 ICU beds), the High Care Burn Unit (BWC-HC, 7 beds) and a hyperbaric oxygen chamber, totalling 31 high care ICU beds of the ZNA "Ziekenhuis Netwerk Antwerpen", Campus Stuivenberg/St-Erasmus in Antwerp, Belgium. He is a critical care physician with a basic training in internal medicine. He is actively involved in the European Society of Intensive Care Medicine (ESICM) and studied the effects of raised intra-abdominal pressure (IAP) in general ICU patients for the last 15 years. He recently finished the Patient Acute Care Training (PACT) module on abdominal problems. He was the Scientific program Chair together with Michael Sugrue of the 2nd World Congress on Abdominal Compartment Syndrome, Noosa, Australia, Dec 6-8 in 2004 and he was the chairman of the 3rd WCACS in Antwerp, Belgium, march 22-24 in 2007 (www.wcacs.org). He is the founding President and actual Treasurer of the World Society on Abdominal Compartment Syndrome (WSACS at www.wsacs.org). Besides IAP, his favourite topic is less invasive (hemodynamic) monitoring and he enjoys his active involvement in (bedside) teaching and education of medical trainees and students. In 2003 he was the first ESICM Chris Stoutenbeek Award winner in Amsterdam with a study protocol on different intra-abdominal pressure measurement methods. He successfully defended his PhD doctorate's thesis in 2007 on the same topic (KU Leuven, promotor Prof Dr Alexander Wilmer). He is author and co-author of several peer reviewed articles, reviews, editorials, book chapters and even a whole book on ACS.



Further Reading

1. Rivers E, Nguyen B, Havstad S, Ressler J, Muzzin A, Knoblich B, Peterson E, Tomlanovich M; Early Goal-Directed Therapy Collaborative Group. Early goal-directed therapy in the treatment of severe sepsis and septic shock. *N Engl J Med.* 2001 Nov 8;345(19):1368-77.
2. Murphy CV, Schramm GE, Doherty JA, Reichley RM, Gajic O, Afessa B, et al. The importance of fluid management in acute lung injury secondary to septic shock. *Chest.* 2009 Jul;136(1):102-9.
3. Cordemans C, De laet I, Van Regenmortel N, Schoonheydt K, Dits H, Huber W, et al. Fluid management in critically ill patients: The role of extravascular lung water, abdominal hypertension, capillary leak and fluid balance. *Annals Intensive Care.* 2012;accepted for publication.

9. Assessment of fluid therapy: use the right tool for the right job!

What are the tools we have at our disposal to keep the fluid therapy in control? When do we use them? What about noninvasive, noncalibrated devices to measure cardiac output? How less invasive can one go in a septic patient under vasopressors? Can we use new techniques like electric impedance or fingercuff pressure in ICU patients? Do we need a specific device for a specific patient?

Xavier Monnet

Postgraduate certification

1988-1994: Medical student, Pitié-Salpêtrière Medical School, Paris.

1994-2000: Resident in infectious disease, cardiology and medical intensive care.

1998-1999: Master of science in Experimental and Clinical Pharmacology, INSERM E 00 01.

2000-2002: PhD degree in Pharmacology, Paris-11 University.

2002-2006: Assistant-professor

Since 2006: Associate professor in Therapeutics and intensive care medicine

Since 2009: Full professor in Intensive Care Medicine

Medical Intensive Care Unit, Paris-11 University Bicêtre Hospital

Board certification

1992: Board certification in neurophysiology, Pitié-Salpêtrière Medical School.

1998: Board certification in echocardiography, Paris-12 University.

1999: Master of science in Experimental and Clinical Pharmacology, Paris-11 University.

2000: Specialist in cardiology.

2001: Board certification in Mechanical Ventilation, Paris-12 University.

2002: Board certification in Critical Infectious Disease, Paris-7 University.

2004: PhD degree in Pharmacology, Paris-11 University.

2005: Specialist in Medical Intensive Medicine.

2005: Board certification in Medical Learning, Paris-12 University.

2009: Authorization for research direction, Paris-11 University

Membership of professional societies

Member of the Société de réanimation de langue française (SRLF).

Since 2008: Member of the Scientific Committee of the SRLF.

Member the Association pédagogique nationale des enseignants de thérapeutique (APNET).



Further reading

1. Cecconi M, Rhodes A, Poloniecki J, Della Rocca G, Grounds RM. Bench-to-bedside review: the importance of the precision of the reference technique in method comparison studies -with specific reference to the measurement of cardiac output. *Crit Care*. 2009;13(1):201. Epub 2009 Jan 13.
2. Peyton PJ, Chong SW. Minimally invasive measurement of cardiac output during surgery and critical care: a meta-analysis of accuracy and precision. *Anesthesiology*. 2010 Nov;113(5):1220-35. Review.

10. Perioperative fluid optimisation: from gut feeling to closed loops?

Old habits die hard but does the good old central venous and capillary wedge pressures still hold against the new volumetric armamentarium? When are barometric indices of preload not working? Why are static filling pressures useless as resuscitation endpoint since they may lead to under- or futile overresuscitation? Why are volumetric indices better in conditions of increased intrathoracic pressure?

Frédéric Michard

Frédéric Michard is certified in Respiratory & Critical Care Medicine and has more than 15 years of clinical experience. He trained at the University Hospitals of Paris and did a critical care research fellowship at Harvard Medical School. He has co-authored many scientific publications on heart-lung interactions, transpulmonary thermodilution, pulse pressure variation, fluid responsiveness and peri-operative hemodynamic optimization. He has also over 10 years of collaboration with the global medical device industry and is co-inventor on 9 patents related to hemodynamic monitoring. He is a member of the Hemodynamic Research Group, University of Geneva, and Vice President, Global Medical Strategy at Edwards Lifesciences, Irvine, USA.



Further Reading

1. Rivers EP, Coba V, Whitmill M. Early goal-directed therapy in severe sepsis and septic shock: a contemporary review of the literature. *Curr Opin Anaesthesiol.* 2008 Apr;21(2):128-40. Review.
2. Marik PE, Monnet X, Teboul JL. Hemodynamic parameters to guide fluid therapy. *Ann Intensive Care.* 2011 Mar 21;1(1):1.
3. Marik PE, Baram M, Vahid B. Does central venous pressure predict fluid responsiveness? A systematic review of the literature and the tale of seven mares. *Chest.* 2008 Jul;134(1):172-8. Review.
4. Michard F, Teboul JL. Predicting fluid responsiveness in ICU patients: a critical analysis of the evidence. *Chest.* 2002 Jun;121(6):2000-8. Review.
5. Michard F, Alaya S, Zarka V, Bahloul M, Richard C, Teboul JL. Global end-diastolic volume as an indicator of cardiac preload in patients with septic shock. *Chest.* 2003 Nov;124(5):1900-8.
6. Gurgel ST, do Nascimento P Jr. Maintaining tissue perfusion in high-risk surgical patients: a systematic review of randomized clinical trials. *Anesth Analg.* 2011 Jun;112(6):1384-91. Epub 2010 Dec 14. Review.
7. Brienza N, Giglio MT, Marucci M, Fiore T. Does perioperative hemodynamic optimization protect renal function in surgical patients? A meta-analytic study. *Crit Care Med.* 2009 Jun;37(6):2079-90. Review.
8. Poeze M, Greve JW, Ramsay G. Meta-analysis of hemodynamic optimization: relationship to methodological quality. *Crit Care.* 2005;9(6):R771-9. Epub 2005 Nov 15. Review.

11. Frank Starling revisited: the importance of fluid responsiveness

Is the patient really in need for extra fluid? How can you tell? Why can a fluid challenge be dangerous for the patient? Can we always trust the passive leg raising test? Is there any difference in the prognostic value between SVV, PPV, SPV? Can we use the respiratory systolic variation test at the bedside? Do we need new thresholds for fluid responsiveness in conditions of increased intrathoracic or intraabdominal pressure? Do functional hemodynamics work in patients with right heart failure or spontaneous breathing? Has a low SVV any meaning in patients with atrial fibrillation?

Jean-Louis Vincent

Dr Vincent is Professor of intensive care at the University of Brussels and Head of the Department of Intensive Care at the Erasme University Hospital in Brussels. Specialist in Internal Medicine, he spent two years training at the University of Southern California with Prof. Max Harry Weil.

Dr. Vincent has signed more than 750 original articles, quite 300 book chapters and review articles, and 800 original abstracts, and he has edited 86 books. He is co-editor of the Textbook of Critical Care (Elsevier Saunders, 5th Edition).

Dr. Vincent is the editor-in-chief of "Critical Care", "Current Opinion in Critical Care", and "ICU Management". He is member of the Editorial Boards of about 30 journals including "Critical Care Medicine" (senior editor), "PLoS Medicine", "Lancet Infectious Diseases", "Anesthesiology", "Intensive Care Medicine", "Chest", "Shock", and "Journal of Critical Care".

Dr. Vincent is presently Secretary General of the World Federation of Societies of Intensive and Critical Care Medicine. He is a Past-President of the European Society of Intensive Care Medicine, the European Shock Society, and the International Sepsis Forum.

For 31 years he has organized an International Symposium on Intensive Care and Emergency Medicine which is held every March in Brussels.

He received the Distinguished Investigator award of the Society of Critical Care Medicine, the College Medalist Award of the American College of Chest Physicians, he was the Recipient of the "Society Medal" (lifetime award) of the European Society of Intensive Care Medicine and he received the prestigious Belgian scientific award of the FRS-FNRS (Prix Scientifique Joseph Maisin-Sciences biomédicales cliniques).



Further Reading

1. Marik PE, Cavallazzi R, Vasu T, Hirani A. Dynamic changes in arterial waveform derived variables and fluid responsiveness in mechanically ventilated patients: a systematic review of the literature. *Crit Care Med.* 2009 Sep;37(9):2642-7. Review.
2. Velissaris D, Pierrakos C, Scolletta S, De Backer D, Vincent JL. High mixed venous oxygen saturation levels do not exclude fluid responsiveness in critically ill septic patients. *Crit Care.* 2011 Jul 26;15(4):R177. [Epub ahead of print]
3. Vincent JL, Rhodes A, Perel A, Martin GS, Rocca GD, Vallet B, Pinsky MR, Hofer CK, Teboul JL, de Boode WP, Scolletta S, Vieillard-Baron A, De Backer D, Walley KR, Maggiorini M, Singer M. Clinical review: Update on hemodynamic monitoring - a consensus of 16. *Crit Care.* 2011 Aug 18;15(4):229. [Epub ahead of print]

12. The search for the Holy Grail continues: is there a place for lactate?

Is use of blood lactate monitoring in critical care practice is appropriate? Does lactate measurement perform well in a laboratory setting? provide information in a number of clinical situations? relate to metabolic acidosis? increase workers' confidence? alter therapeutic decisions? result in benefit to patients? result in similar benefits in your own setting? result in benefits which are worth the extra costs?

Jan Bakker

Current work:

Jan Bakker is working in the Erasmus MC University Medical Center in the Department of Intensive Care Adults.

He is Chair of the Department of Intensive Care Adults, Chair division of Anesthesiology, Operating Rooms, Intensive Care for Adults and Professor of Medicine Erasmus University Rotterdam



Education:

Propedeuse Psychology : 1979 Free University of Amsterdam

Medicine : 1985 University of Amsterdam

MD-exam : 1987 University of Amsterdam

Internal Medicine

1989 : Hospital Hilversum, Dr. F. van Kersen

1990 : Hopital Erasme Brussel, Prof. Dr. J-L Vincent

1991 : Hospital Hilversum, Dr. F. van Kersen

1991 – 1994 : University Hospital Utrecht,
Prof. Dr. D.W. Erkelens

1994 – 1995 ZcA Lukas Hospital, Dr. D. van Toorn

Registration Internal Medicine : April 1995

Registration Intensive Care : November 1995

INSEAD European Health Leadership Programm: July 2008

Further reading

1. Jansen TC, van Bommel J, Bakker J. Blood lactate monitoring in critically ill patients: a systematic health technology assessment. *Crit Care Med.* 2009 Oct;37(10):2827-39. Review.
2. Jansen TC, van Bommel J, Schoonderbeek FJ, Sleswijk Visser SJ, van der Klooster JM, Lima AP, Willemsen SP, Bakker J; LACTATE study group. Early lactate-guided therapy in intensive care unit patients: a multicenter, open-label, randomized controlled trial. *Am J Respir Crit Care Med.* 2010 Sep 15;182(6):752-61. Epub 2010 May 12.

PART 2: AFTERNOON SESSIONS

SESSION 4: Give Fluids? Avoid Floods!

Chair: Jean-Louis Vincent and Azriel Perel

- | | |
|---------------|---|
| 15:30 - 15:50 | Dry lungs are happy, but a dry liver is deadly: how can dye-dilution help us?
<i>Michael Bauer</i> |
| 15:50 - 16:10 | Techniques for the future: continuity versus accuracy?
<i>Azriel Perel</i> |
| 16:10 - 16:45 | Putting it into practice: an interactive discussion...
<i>The Faculty</i> |
| 16:45 - 17:00 | Closing remarks: wrap it up!
<i>Manu Malbrain</i> |

CHAIRPERSONS

Jean-Louis Vincent

Bio profile: see above



Azriel Perel

Bio profile: see below



13. Dry lungs are happy, but a dry liver is deadly: how can dye-dilution help us?

What's in the pipeline in hemodynamic monitoring? Can we integrate different monitoring tools, eg ventilator and hemodynamic monitor? How do the different body compartments interact? How to deal with therapeutic dilemmas: kidney vs heart; lung vs liver; brain vs lung; heart vs lung? Can we measure lung recruitment or ventilation/perfusion (mis)match at the bedside – is there a place for Electrical Impedance Tomography?

Michael Bauer

Professor and Chief-Executive Director,
Center for Sepsis Control and Care,
Jena University Hospital



Research Interests and Areas of Supervision

- Molecular Medicine
- Mechanisms of organ failure
- Genomics, Transcriptomics and Proteomics in systemic inflammation/sepsis

Curriculum vitae

Aug 2010 – Professor (W3) and chief-executive director, Center for Sepsis Control and Care, Jena University Hospital

2004 – 2010 Professor (C3) and vice chair, Department of Anesthesiology and Intensive Care Medicine, Jena University Hospital

2001 - 2004 Vice chair, Department of Anesthesiology and Intensive Care Medicine, University of Saarland

2000 Venia legendi for Clinical Anesthesiology, Medical Faculty of the University of Saarland

1999 Venia legendi for Experimental Anesthesiology, Medical Faculty of the University of Saarland

1998 - 1999 Visiting Adjunct Professor, Dept. of Biology, University of North Carolina, Charlotte, U.S.A.

1995 - 2000 Resident, Clinic of Anesthesiology and Intensive Care Medicine, University of Saarland

1993 - 1995 Post-Doc, Johns Hopkins University, Baltimore, MD, U.S.A

1991 - 1993 Resident, Clinic of Anesthesiology and Intensive Care Medicine, University of Saarland

1990 Doctoral thesis, M. D. ("magna cum laude")

1990 - 1991 Resident, Department Trauma Surgery, University of Saarland

1983 - 1989 Medical School, University of Saarland, Homburg, and Ninewells Hospital, Medical School, Dundee, Scotland

Memberships in scientific community

- German Society of Anaesthesiology and Intensive Care Medicine (DGAI)
- German Interdisciplinary Association of Critical Care Medicine (DIVI)
- German Sepsis Society (DSG)
- European Shock Society
- Shock Society (US)

Further Reading

1. Kortgen A, Paxian M, Werth M, Recknagel P, Rauchfuss F, Lupp A, Krenn CG, Müller D, Claus RA, Reinhart K, Settmacher U, Bauer M. Prospective assessment of hepatic function and mechanisms of dysfunction in the critically ill. Shock. 2009 Oct;32(4):358-65.

14. Techniques for the future: continuity versus accuracy?

What's in the pipeline in hemodynamic monitoring? How noninvasive can we go? Can we integrate different monitoring tools, e.g. ventilator and hemodynamic monitor? How do the different body compartments interact? How to deal with therapeutic dilemmas: kidney vs heart; lung vs liver; brain vs lung; heart vs lung? Can we measure lung recruitment or ventilation/perfusion (mis)match at the bedside – is there a place for electrical impedance tomography? Should we use protocolised care or do we need individualised decision making? Can we measure urine output and glomerular filtration rate continuously? How could the SMART phone help us at the bedside? Continuity vs accuracy of hemodynamic parameters – which is more important in guiding fluid management?

Azriel Perel

Professor and Chairman
Department of Anesthesiology and Intensive Care
Sheba Medical Center, Te Aviv University, Israel
President, Israel Society of Anesthesiologists



Further reading

1. Perel A. Bench-to-bedside review: the initial hemodynamic resuscitation of the septic patient according to Surviving Sepsis Campaign guidelines--does one size fit all? *Crit Care*. 2008;12(5):223. Epub 2008 Sep 3. Review.
2. Preisman S, Kogan S, Berkenstadt H, Perel A. Predicting fluid responsiveness in patients undergoing cardiac surgery: functional haemodynamic parameters including the Respiratory Systolic Variation Test and static preload indicators. *Br J Anaesth*. 2005 Dec;95(6):746-55.