

REFERENCES

1. Vincent JL, Rhodes A, Perel A, et al: Clinical review: update on hemodynamic monitoring—a consensus of 16. *Crit Care*; 15: 229, 2011.
2. Georger JF, Hamzaoui O, Chaari A, Maizel J, Richard C, Teboul JL: Restoring arterial pressure with norepinephrine improves muscle tissue oxygenation assessed by near-infrared spectroscopy in severely hypotensive septic patients. *Intensive Care Med* 36: 1882, 2010.
3. Dunser MW, Takala J, Ulmer H, et al: Arterial blood pressure during early sepsis and outcome. *Intensive Care Med* 35: 1225, 2009.
4. Rhodes A, Evans LE, Alhazzani W, et al: Surviving Sepsis Campaign: international guidelines for management of sepsis and septic shock: 2016. *Crit Care Med* 45: 486, 2017.
5. Asfar P, Meziani F, Hamel JF, et al: High versus low blood-pressure target in patients with septic shock. *N Engl J Med* 370: 1583, 2014.
6. Leone M, Asfar P, Radermacher P, Vincent JL, Martin C: Optimizing mean arterial pressure in septic shock: a critical reappraisal of the literature. *Crit Care* 19: 101, 2015.
7. Jackson K, Nolan J: The role of hypotensive resuscitation in the management of trauma. *J Intensive Care Soc* 10: 109, 2009.
8. Carrick MM, Leonard J, Slone DS, Mains CW, Bar-Or D: Hypotensive resuscitation among trauma patients. *Biomed Res Int* 2016: 8901938, 2016.
9. Kudo D, Kushimoto S: Permissive hypotension/hypotensive resuscitation and restricted/controlled resuscitation in patients with severe trauma *J Intensive Care* 5: 11, 2017.
10. Carney N, O'Reilly C, Ullman JS, et al: Guidelines for the management of severe traumatic brain injury, 4th edition. *Neurosurgery* 80: 6, 2017.
11. Rossaint R, Bouillon B, Cerny V, et al: The European guideline on management of major bleeding and coagulopathy following trauma: fourth edition. *Crit Care* 20: 100, 2016.
12. Pickering TG, Hall JE, Appel LJ, et al: Recommendations for blood pressure measurement in humans and experimental animals: part 1: blood pressure measurement in humans: a statement for professionals from the Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research. *Circulation* 111: 697, 2005.
13. Poulton TJ: ATLS paradigm fails. *Ann Emerg Med* 17: 107, 1988.
14. Deakin CD, Low JL: Accuracy of the advanced trauma life support guidelines for predicting systolic blood pressure using carotid, femoral, and radial pulses: observational study. *BMJ* 321: 673, 2000.
15. ATLS Subcommittee; American College of Surgeons' Committee on Trauma; International ATLS Working Group: Advanced trauma life support (ATLS): the ninth edition. *J Trauma Acute Care Surg* 74: 1363, 2013.
16. Lakhal K, Macq C, Ehrmann S, Boulain T, Capdevila X: Noninvasive monitoring of blood pressure in the critically ill: reliability according to the cuff site (arm, thigh, or ankle). *Crit Care Med* 40: 1207, 2012.
17. Lehman IW, Saeed M, Talmor D, Mark R, Malhotra A: Methods of blood pressure measurement in the ICU. *Crit Care Med* 41: 34, 2013.
18. Antonelli M, Levy M, Andrews PJ, et al: Hemodynamic monitoring in shock and implications for management. International Consensus Conference, Paris, France, 27–28 April 2006. *Intensive Care Med* 33: 575, 2007.
19. Gershengorn HB, Wunsch H, Scales DC, Zarychanski R, Rubenfeld G, Garland A: Association between arterial catheter use and hospital mortality in intensive care units. *JAMA Intern Med* 174: 1746, 2014.
20. Lakhal K, Ehrmann S, Boulain T: Noninvasive BP monitoring in the critically ill: time to abandon the arterial catheter? *Chest* 153: 1023, 2018.
21. Magder S: Central venous pressure: a useful but not so simple measurement. *Crit Care Med*; 34: 2224, 2006.
22. Drazner MH, Rame JE, Stevenson LW, Dries DL: Prognostic importance of elevated jugular venous pressure and a third heart sound in patients with heart failure. *N Engl J Med* 345: 574, 2001.
23. Perera P, Mailhot T, Riley D, Mandavia D: The RUSH exam: rapid ultrasound in shock in the evaluation of the critically ill. *Emerg Med Clin North Am* 28: 29, 2010.
24. Cherpanath TG, Geerts BE, Lagrand WK, Schultz MJ, Groeneweld AB: Basic concepts of fluid responsiveness. *Neth Heart J* 21: 530, 2013.
25. Marik PE, Lemson J: Fluid responsiveness: an evolution of our understanding. *Br J Anaesthet* 112: 617, 2014.
26. Monnet X, Rienzo M, Osman D, et al: Passive leg raising predicts fluid responsiveness in the critically ill. *Crit Care Med* 34: 1402, 2006.
27. Hadian M, Pinsky MR: Functional hemodynamic monitoring. *Curr Opin Crit Care* 13: 318, 2007.
28. Gunn SR, Pinsky MR: Implications of arterial pressure variation in patients in the intensive care unit. *Curr Opin Crit Care* 7: 212, 2001.
29. Michard F, Boussat S, Chemla D, et al: Relation between respiratory changes in arterial pulse pressure and fluid responsiveness in septic patients with acute circulatory failure. *Am J Respir Crit Care Med* 162: 134, 2000.
30. Lopes MR, Oliveira MA, Pereira VO, Lemos IP, Auler JO Jr, Michard F: Goal-directed fluid management based on pulse pressure variation monitoring during high-risk surgery: a pilot randomized controlled trial. *Crit Care* 11: R100, 2007.
31. Benes J, Giglio M, Brienza N, Michard F: The effects of goal-directed fluid therapy based on dynamic parameters on post-surgical outcome: a meta-analysis of randomized controlled trials. *Crit Care* 18: 584, 2014.
32. Zhang Z, Lu B, Sheng X, Jin N: Accuracy of stroke volume variation in predicting fluid responsiveness: a systematic review and meta-analysis. *J Anesth* 25: 904, 2011.
33. Mercado P, Maizel J, Beyls C, et al: Transthoracic echocardiography: an accurate and precise method for estimating cardiac output in the critically ill patient. *Crit Care* 21: 136, 2017.
34. Fast JH, van den Merkhoef L, Blans W, van Leeuwen K, Uijen G: Determination of cardiac output by single gated pulsed Doppler echocardiography. *Int J Cardiol* 21: 33, 1988.
35. Lalani AV, Lee SJ: Echocardiographic measurement of cardiac output using the mitral valve and aortic root echo. *Circulation* 54: 738, 1976.
36. Porter TR, Shillcutt SK, Adams MS, Desjardins G, Glas KE, Olson JJ, Trouton RW: Guidelines for the use of echocardiography as a monitor for therapeutic intervention in adults: a report from the American Society of Echocardiography. *J Am Soc Echocardiogr* 28: 40, 2015.
37. Brant EB, Kobzik AJ, Goodmanson NW, Skolnik AB, Hamade B, Schott CK: Guiding resuscitation in the emergency department. *Emerg Med* 50: 85, 2018.
38. Rajaram SS, Desai NK, Kalra A, et al: Pulmonary artery catheters for adult patients in intensive care. *Cochrane Database Syst Rev* 2: CD003408, 2013.
39. Reinhart K, Kuhn HJ, Hartog C, Bredle DL: Continuous central venous and pulmonary artery oxygen saturation monitoring in the critically ill. *Intensive Care Med* 30: 1572, 2004.
40. Dueck MH, Klimek M, Appenrodt S, Weigand C, Boerner U: Trends but not individual values of central venous oxygen saturation agree with mixed venous oxygen saturation during varying hemodynamic conditions. *Anesthesiology* 103: 249, 2005.
41. Kompanje EJ, Jansen TC, van der Hoven B, Bakker J: The first demonstration of lactic acid in human blood in shock by Johann Joseph Scherer (1814–1869) in January 1843. *Intensive Care Med* 33: 1967, 2007.
42. Fall PJ, Szerlip HM: Lactic acidosis: from sour milk to septic shock. *J Intensive Care Med* 20: 255, 2005.
43. Kruse JA, Zaidi SA, Carlson RW: Significance of blood lactate levels in critically ill patients with liver disease. *Am J Med* 83: 77, 1987.
44. Shankar-Hari M, Phillips GS, Levy ML, et al: Developing a new definition and assessing new clinical criteria for septic shock: for the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA* 315: 775, 2016.
45. Lee SM, An WS: New clinical criteria for septic shock: serum lactate level as new emerging vital sign. *J Thorac Dis* 8: 1388, 2016.
46. Nguyen HB, Rivers EP, Knoblich BP, et al: Early lactate clearance is associated with improved outcome in severe sepsis and septic shock. *Crit Care Med* 32: 1637, 2004.
47. Kraut JA, Madias NE: Lactic acidosis. *N Engl J Med* 372: 1078, 2015.