CHAPTER 16

Blood Gases

Casey Glass

REFERENCES

1. The ARDS Definition Task Force: Acute respiratory distress syndrome. The Berlin definition. *JAMA* 307: 2526, 2012. [PMID: 22797452]
2. Quinn LM, Hamnett N, Wilkin R, Sheikh A: Arterial blood gas analyzers: accuracy in determining hemoglobin, glucose and electrolyte concentrations in critically ill adult patients. *Br J Biomed Sci* 70: 97, 2013. [PMID: 24273894]
3. Budak YU, Huysal K, Polat M: Use of a blood gas analyzer and a laboratory autoanalyzer in routine practice to measure electrolytes in intensive care unit patients. *BMC Anesthesiol* 12: 17, 2012. [PMID: 22862792]
4. Leino A, Kurvinen K: Interchangeability of blood gas, electrolyte, and metabolite results measured with point-of-care, blood gas and core laboratory analyzers. *Clin Chem Lab Med* 49: 1187, 2011. [PMID: 21504373]
5. Jain A, Subhan I, Joshi M: Comparison of the point-of-care blood gas analyzer versus the laboratory auto-analyzer for the measurement of electrolytes. *Int J Emerg Med* 2: 117, 2009. [PMID: 20157454]
6. King R, Campbell A: Performance of the radiometer OSM3 and ABL505 blood gas analyzers for determination of sodium, potassium, and hemoglobin concentrations. *Anaesthesia* 55: 65, 2000. [PMID: 10594433]
7. Dellinger RP, Levy MM, Rhodes A, et al: Surviving Sepsis Campaign: international guidelines for management of severe sepsis and septic shock, 2012. *Intensive Care Med* 39: 165, 2013. [PMID: 23361625]
8. Varpula M, Tallgren M, Saukkonen K, Voipio-Pulkki LM, Pettilä V: Hemodynamic variables related to outcome in septic shock. *Intensive Care Med* 31: 1066, 2005. [PMID: 15973520]
9. Kopterides P, Bonovas S, Mavrou I, Kostadima E, Zakynthinos E, Armaganidis A: Venous oxygen saturation and lactate gradient from superior vena cava to pulmonary artery in patients with septic shock. *Shock* 31: 561, 2009. [PMID: 18838939]
10. Varpula M, Karlsson S, Ruokonen E, Pettilä V: Mixed venous oxygen saturation cannot be estimated by central venous oxygen saturation in septic shock. *Intensive Care Med* 32: 1336, 2006. [PMID: 16826387]
11. Chawla LS, Zia H, Gutierrez G, Katz NM, Seneff MG, Shah M: Lack of equivalence between central and mixed venous oxygen saturation. *Chest* 126: 1891, 2004. [PMID: 15596689]
12. Ladakis C, Myrianthefs P, Karabinis A, et al: Central venous and mixed venous oxygen saturation in critically ill patients. *Respiration* 68: 279, 2001. [PMID: 11416249]
13. Edwards JD, Mayall RM: Importance of the sampling site for measurement of mixed venous oxygen saturation in shock. *Crit Care Med* 26: 1356, 1998. [PMID: 9710094]
14. Bloom BM, Grundlingh J, Bestwick JP, Harris T: The role of venous blood gas in the emergency department: a systematic review and meta-analysis. *Eur J Emerg Med* 21: 81, 2014. [PMID: 23903783]
15. Byrne AL, Bennett M, Chatterji R, Symons R, Pace NL, Thomas PS: Peripheral venous and arterial blood gas analysis in adults: are they comparable? A systematic review and meta-analysis. *Respirology* 19: 168, 2014. [PMID: 24383789]
16. Kelly AM, Klim S: Agreement between arterial and venous pH and pCO_2 in patients undergoing non-invasive ventilation in the emergency department. *Emerg Med Australas* 25: 203, 2013. [PMID: 23759038]
17. Raoufy MR, Eftekhari P, Gharibzadeh S, Masjedi MR: Predicting arterial blood gas values from venous samples in patients with acute exacerbation chronic obstructive pulmonary disease using artificial neural network. *J Med Syst* 35: 483, 2011. [PMID: 20703542]
18. Lim BL, Kelly AM: A meta-analysis on the utility of peripheral venous blood gas analyses in exacerbations of chronic obstructive pulmonary disease in the emergency department. *Eur J Emerg Med* 17: 246, 2010. [PMID: 19996974]
19. Malatesha G, Singh NK, Bharija A, Rehani B, Goel A: Comparison of arterial and venous pH, bicarbonate, PCO_2 and PO_2 in initial emergency department assessment. *Emerg Med J* 24: 569, 2007. [PMID: 17652681]
20. Kelly AM, Klim S, Rees SE: Agreement between mathematically arterialised venous versus arterial blood gas values in patients undergoing non-invasive ventilation: a cohort study. *Emerg Med J* 31: e46, 2014. [PMID: 24136117]
21. Tygesen G, Matzen H, Grønkjær K, et al: Mathematical arterialization of venous blood in emergency medicine patients. *Eur J Emerg Med* 19: 363, 2012. [PMID: 22082876]
22. Rees SE, Rychwicka-Kielek BA, Andersen BF, et al: Calculating acid-base and oxygenation status during COPD exacerbation using mathematically arterialised venous blood. *Clin Chem Lab Med* 50: 2149, 2012. [PMID: 23093283]
23. Toftegaard M, Rees SE, Andreassen S: Evaluation of a method for converting venous values of acid-base and oxygenation status to arterial values. *Emerg Med J* 26: 268, 2009. [PMID: 19307387]
24. Rees SE, Hansen A, Toftegaard M, Pedersen J, Kristensen SR, Harving H: Converting venous acid-base and oxygen status to arterial in patients with lung disease. *Eur Respir J* 33: 1141, 2009. [PMID: 19129271]
25. Browning R, Datta D, Gray AJ, Graham C: Peripheral venous and arterial lactate agreement in septic patients in the emergency department: a pilot study. *Eur J Emerg Med* 21: 139, 2014. [PMID: 23591521]
26. Bloom B, Pott J, Freund Y, Grundlingh J, Harris T: The agreement between abnormal venous lactate and arterial lactate in the ED: a retrospective chart review. *Am J Emerg Med* 32: 596, 2014. [PMID: 24745873]
27. Middleton P, Kelly AM, Brown J, Robertson M: Agreement between arterial and central venous values for pH, bicarbonate, base excess, and lactate. *Emerg Med J* 23: 622, 2006. [PMID: 16858095]
28. Lee WW, Mayberry K, Crapo R, Jensen RL: The accuracy of pulse oximetry in the emergency department. *Am J Emerg Med* 18: 427, 2000. [PMID: 10919532]
29. Wilson BJ, Cowan HJ, Lord JA, Zuege DJ, Zygun DA: The accuracy of pulse oximetry in emergency department patients with severe sepsis and septic shock: a retrospective cohort study. *BMC Emerg Med* 10: 9, 2010. [PMID: 20444248]
30. Ross PA, Newth CJ, Khemani RG: Accuracy of pulse oximetry in children. *Pediatrics* 133: 22, 2014. [PMID: 24344108]
31. Doğan NÖ, Şener A, Günaydın GP, et al: The accuracy of mainstream end-tidal carbon dioxide levels to predict the severity of chronic obstructive pulmonary disease exacerbations presented to the ED. *Am J Emerg Med* 32: 408, 2014. [PMID: 24560835]
32. Cinar O, Acar YA, Arziman I, Kilic E, Eyi YE, Ocal R: Can mainstream end-tidal carbon dioxide measurement accurately predict the arterial carbon dioxide level of patients with acute dyspnea in ED. *Am J Emerg Med* 30: 358, 2012. [PMID: 21277140]
33. Pekdemir M, Cinar O, Yilmaz S, Yaka E, Yuksel M: Disparity between mainstream and sidestream end-tidal carbon dioxide values and arterial carbon dioxide levels. *Respir Care* 58: 1152, 2013. [PMID: 23322889]
34. Delerme S, Freund Y, Renault R, et al: Concordance between capnography and capnia in adults admitted for acute dyspnea in an ED. *Am J Emerg Med* 28: 711, 2010. [PMID: 20637388]
35. Brochard L, Martin GS, Blanch L, et al: Clinical review: respiratory monitoring in the ICU: a consensus of 16. *Crit Care* 16: 219, 2012.