



DAFTAR PUSTAKA

- Abbas, A. K., Lichtman, A. H., & Pillai, S. (2018). Innate Immunity. In : Merritt, J., & Grulio, R (Eds.), *Cellular and Molecular Immunology* 9th Ed., pp : 57-80, Philadelpia: Elsevier Ltd.
- Abbott Laboratories. (2001). *Precedex approval documents*. Available from: http://www.accessdata.fda.gov/drugsatfda_docs/nda/99/21-038_Precedex.cfm. (Accessed 15 June 2023).
- Abdallah, O., Salem, M. I., & Gomaa, M. (2022). Dexmedetomidine versus propofol in reducing atrial fibrillation after cardiac surgery. *Egyptian Journal of Anaesthesia.*, 38 : 72–77.
- Abdelrahman, K. A., Hassan, S. A., Mohammed, A. A., Abdelhakeem, E. E., Abd-Elshafy, S. K., Salama, R. H., et al. (2020). The effect of dexmedetomidine on the inflammatory response in children undergoing repair of congenital heart disease: a randomized controlled clinical trial. *Egypt. J. Anaesth.*, 36 : 297–304.
- Adamik, B., Kübler, A., Gozdzik, A., & Gozdzik, W. (2017). Prolonged cardiopulmonary bypass is a risk factor for intestinal ischaemic damage and endotoxaemia. *Heart Lung Circ.*, 26 : 717–723.
- Aicher, S.A., Punnoose, A., dan Goldberg, A. (2000). μ -opioid receptors often colocalize with the substance P receptor (NK1) in the trigeminal dorsal horn. *J. Neurosci.*, 20 : 4345–4354.
- Akeju, O., Hobbs, L.E., Gao, L., Burns, S.M., Pavone, K.J., Plummer, G.S., et al. (2017). Dexmedetomidine promotes biomimetic non-rapid eye movement stage 3 sleep in humans: A pilot study. *Clin. Neurophysiol.*, 129 : 69–78.
- Allan, C. K., Newburger, J. W., McGrath, E., Elder, J., Psoinos, C., Laussen, P. C., et al. (2010). The relationship between inflammatory activation and clinical outcome after infant cardiopulmonary bypass. *Anesth. Analg.*, 111 : 1244–1251.
- Alam, S., Shalini, A., Hegde, R. G., Mazahir, R., & Jain, A. (2018). Predictors and outcome of early extubation in infants postcardiac surgery: A single-center observational study. *Ann. Card. Anaesth.*, 4 : 402-406.
- Alston, R. P., Myles, P. S., & Ranucci, M. (2015). Myocardial protection during cardiac surgery. In : Irwin, M. G., & Wong, G. T. (Eds.), *The Oxford Textbook of Cardiothoracic Anaesthesia.*, pp. 157-163. Oxford: Oxford University Press, UK.
- Andersen, L. W. (2017). Lactate elevation during and after major cardiac surgery in adults: A review of etiology, prognostic value, and management. *Anesthesia and Analgesia.*, 125 : 743–752.
- Bajwa, S., & Kulshrestha, A. (2013). Dexmedetomidine: An adjuvant making large inroads into clinical practice. *Ann. Med. Health Sci. Res.*, 3 : 475.
- Banday, A.A., & Lokhandwala, M.F. (2018). Oxidative stress impairs cGMP-dependent protein kinase activation and vasodilator-stimulated phosphoprotein serine-phosphorylation. *Clin. Exp. Hypertens.*, 41 : 5–13.
- Beghetti, M., Rimensberger, P.C., Kalangos, A., Habre, W., & Gervaix, A. (2003). Kinetics of procalcitonin, interleukin 6 and C-reactive protein after cardiopulmonary-bypass in children. *Cardiol. Young.*, 13 : 161–167.



- Behmenburg, F., Pickert, E., Mathes, A., Heinen, A., Hollmann, M.W., Huhn, R., *et al.* (2017). The cardioprotective effect of dexmedetomidine in rats is dose-dependent and mediated by bkca channels. *J. Cardiovasc. Pharmacol.*, 69 : 228–235.
- Berger, J., Holubkov, R., Reeder, R., Wessel, D., Meert, K., Berg, R., *et al.* (2017). Morbidity and mortality prediction in pediatric heart surgery: physiological profiles and surgical complexity. *Physiol. Behav.*, 176 : 139–148.
- Bleese, N., Döring, V., Kalmar, P., Pokar, H., Polonius, M.J., Steiner, D., *et al.* (1978). Intraoperative myocardial protection by cardioplegia in hypothermia: Clinical findings. *J. Thorac. Cardiovasc. Surg.*, 75: 405–413.
- Boehne, M., Sasse, M., Karch, A., Dziuba, F., Horke, A., Kaussen, T., *et al.* (2017). Systemic inflammatory response syndrome after pediatric congenital heart surgery: Incidence, risk factors, and clinical outcome. *J. Card. Surg.*, 32 : 116–125.
- Bolli, R., & Marban, E. (1999). Molecular and cellular mechanisms of myocardial stunning. *American physiological society.*, 79 : 609–634.
- Bousselmi, R., Lebbi, M.A., & Ferjani, M. (2014). Myocardial ischemic conditioning: Physiological aspects and clinical applications in cardiac surgery. *J. Saudi Heart Assoc.*, 26 : 93–100.
- Brown, K. L., Ridout, D. A., Goldman, A. P., Hoskote, A., & Penny, D. J. (2003). Risk factors for long intensive care unit stay after cardiopulmonary bypass in children. *Crit. Care Med.*, 31 : 28–33.
- Carollo, D. S., Nossaman, B. D., & Ramadhyani, U. (2008). Dexmedetomidine: a review of clinical applications. *Curr. Op. Anaesthesiol.*, 21 : 457–461.
- Castillo, R.L., Ibáñez, M., Cortínez, I., Carrasco-Pozo, C., Farías, J.G., Carrasco, R.A., *et al.* (2020). Dexmedetomidine improves cardiovascular and ventilatory outcomes in critically ill patients: basic and clinical approaches. *Front. Pharmacol.*, 10 : 1–17.
- Chandler, H. K., & Kirsch, R. (2016). Management of the low cardiac output syndrome following surgery for congenital heart disease. *Curr. Cardiol. Rev.*, 12 : 107–111.
- Chan, P.G., Seese, L., Aranda-Michel, E., Sultan, I., Gleason, T.G., Wang, Y., *et al.* (2021). Operative mortality in adult cardiac surgery: is the currently utilized definition justified?. *J. Thorac. Dis.*, 13 : 5582–5591.
- Cheng, X. Y., Gu, X. Y., Gao, Q., Zong, Q. F., Li, X. H., & Zhang, Y. (2016). Effects of dexmedetomidine postconditioning on myocardial ischemia and the role of the PI3K/Akt-dependent signaling pathway in reperfusion injury. *Mol. Med. Rep.*, 1 : 797–803.
- Chrysostomou, C., Schulman, S.R., Herrera Castellanos, M., Cofer, B.E., Mitra, S., da Rocha, M.G., *et al.* (2014). A phase II/III, multicenter, safety, efficacy, and pharmacokinetic study of dexmedetomidine in preterm and term neonates. *J. Pediatr.*, 164 : 276–282.
- Chung, M. J., & Brown, D. L. (2018). Diagnosis of acute myocardial infarction. In cardiac intensive care. *Elsevier Inc.*, 3 : 91-98.
- Corbi, P., Rahmati, M., Delwail, A., Potreau, D., Menu, P., Wijdenes, J., Lecron, J. (2000). Circulating soluble gp130, soluble IL-6R, and IL-6 in patients



- undergoing cardiac surgery, with or without extracorporeal circulation. *Eur. J. Cardiothorac. Surg.*, 18 : 98–103.
- Cunningham, F. E., Baughman, V. L., Tonkovich, L., Lam, N., & Layden, T. (1999). Pharmacokinetics of dexmedetomidine (DEX) in patients with hepatic failure (HF). *Clin. Pharmacol. Ther.*, 65 : 128–128.
- De Wolf, A. M. , Fragen, R. J. , Avram, M. J., Fitzgerald, P. C., & Rahimi-Danesh, F. (2001). The pharmacokinetics of dexmedetomidine in volunteers with severe renal impairment. *Anesth. Analg.*, 93 : 1205–1209.
- Dutta, S., Lal, R., Karol, M. D., Cohen, T., & Ebert, T. (2000). Influence of cardiac output on dexmedetomidine pharmacokinetics. *J. Pharm. Sci.*, 89 : 519–527.
- El Amrousy, D. M., Elshamaa, N.S., El-Kashlan, M., Hassan, S., Elsanosy, M., Hablas, N., et al. (2017). Efficacy of prophylactic dexmedetomidine in preventing postoperative junctional ectopic tachycardia after pediatric cardiac surgery. *J. Am. Heart. Assoc.*, 6 : 1–5.
- Elgebaly, A. S., Fathy, sameh mohammad, Sallam, A. A., & Elbarbary, Y. (2020). Cardioprotective effects of propofol - dexmedetomidine in open - heart surgery: a prospective double - blind study. *Annals of Cardiac Anaesthesia*, 23 : 134-141.
- El-Morsy, G. Z. & Elgamal, A. F. (2014). Dexmedetomidine: an adjuvant drug for fast track technique in pediatric cardiac surgery. *Egypt. J. Anaesth.*, 40 : 347–351.
- Epting, C. L., McBride, M. E., Wald, E. L., & Costello, J. M. (2016). Pathophysiology of post-operative low cardiac output syndrome. *Curr. Vasc. Pharmacol.*, 14 : 14-23.
- Etievent, J. P., Chocron, S., Toubin, G., Taberlet, C., Alwan, K. T., Clement, F., et al. (1995). Use of cardiac troponin I as a marker of perioperative myocardial ischemia. *Ann. Thorac. Surg.*, 59 : 1192–1194.
- Flam, B. R., Eichler, D. C., & Solomonson, L. P. (2007). Endothelial nitric oxide production is tightly coupled to the citrulline-NO cycle. *Nitric Oxide - Biology and Chemistry*, 17 : 115–121.
- Fleitman, J. (2023). Pulmonary artery catheterization: Interpretation of hemodynamic values and waveforms in adults. In : Lamont, J. T., Bogorodskaya, M. & Grover, S. (Eds.), *UpToDate.*, pp. 1-34. Waltham: USA.
- Froese, N. R., Sett, S. S., Mock, T., & Krahn, G. E. (2009). Does troponin-I measurement predict low cardiac output syndrome following cardiac surgery in children?. *Crit. Care Resusc.*, 11 : 116–121.
- Galvis, M., Bhakta, R., Tarmahomed, A., & Mendez, M. (2021). Cyanotic heart disease. In : StatPearls (Ed.), *NCBI Bookshelf.*, pp. 1–7. Treasure Island : StatPearls publishing LLC.
- Gautam, N. K., Turiy, Y., & Srinivasan, C. (2017). Preincision initiation of dexmedetomidine maximally reduces the risk of junctional ectopic tachycardia in children undergoing ventricular septal defect repairs. *J. Cardiothorac. Vasc. Anesth.*, 31 : 1960–1965.



- Geier, L., Menzel, C., Germund, I., & Trieschmann, U. (2020). RACHS-1 score as predictive factor for postoperative ventilation time in children with congenital heart disease. *Cardiol Young.*, 30 : 213–218.
- Ghasemzadeh, B., Azizi, B., Azemati, S., & Bagherinasab, M. (2020). The effects of dexmedetomidine prescription in paediatric patients with pulmonary hypertension under congenital heart surgery. *Acta Med. Iran.*, 58 : 171–176.
- Giacinto, O., Satriano, U., Nenna, A., Spadaccio, C., Lusini, M., Mastroianni, C., et al. (2019). Inflammatory response and endothelial dysfunction following cardiopulmonary bypass: pathophysiology and pharmacological targets. *Recent Pat. Inflamm. Allergy Drug Discov.*, 13 : 158–173.
- Gillepsie, M., Kujipers, M., Rossem, M.V., Ravishankar, C., Gaynor, J.W., Spray, T., et al. (2006). Determinants of intensive care unit length of stay for infants undergoing cardiac surgery. *Congenit. Heart Dis.*, 4 : 152–160.
- Gong, T., Liu, L., Jiang, W., & Zhou, R. (2020). DAMP-sensing receptors in sterile inflammation and inflammatory diseases. *Nat. Rev. Immunol.*, 2 : 95–112.
- Greenberg, R.G., Wu, H., Laughon, M., Capparelli, E., Rowe, S., Zimmerman, K.O., et al. (2017). Population pharmacokinetics of dexmedetomidine in infants. *J. Clin. Pharmacol.*, 57 : 1174–1182.
- Gu, J., Sun, P., Zhao, H., Watts, H.R., Sanders, R.D., Terrando, N., et al. (2011). Dexmedetomidine provides renoprotection against ischemia-reperfusion injury in mice. *Crit. Care.*, 15 : R153.
- Hall, J. E., & Hall, M. E. (2021). Cardiac muscle; the heart as a pump and function of the heart valves. In : O'Grady, E., Shreiner, J., Onderlinde, G., & Grulio, R. (Eds.), *Guyton and Hall Textbook of Medical Physiology*, 14th Ed., pp. 113-126. Philadelphia: Elsevier, USA.
- Hammer, G., & Shafer, S.L. (2020). Playing with dexmedetomidine pharmacokinetics!. *Br. J. Anaesth.*, 124 : 238–240.
- Hannivoort, L. N., Eleveld, D. J., Proost, J. H., Reyntjens, K. M. E. M., Absalom, A.R., Vereecke, H.E.M., & Struys, M.M.R.F. (2015). Development of an optimized pharmacokinetic model of dexmedetomidine using target-controlled infusion in healthy volunteers. *Anesthesiology*, 123 : 357–367.
- Hariyanto, D. (2016). Profil Penyakit Jantung Bawaan di Instalasi Rawat Inap Anak RSUP Dr. M. Djamil Padang Januari 2008-Februari 2011. *Sari Pediatri*, 14: 152-157.
- Hasegawa, T., Oshima, Y., Maruo, A., Matsuhisa, H., Tanaka, A., Noda, R., et al. (2015). Dexmedetomidine in combination with midazolam after pediatric cardiac surgery. *Asian Cardiovascular and Thoracic Annals.*, 23 : 802–808.
- Hausernloy, D.J., & Yellon, D.M. (2011). The therapeutic potential of ischemic conditioning: An update. *Nat. Rev. Cardiol.*, 8 : 619–629.
- Hausernloy, D.J., & Yellon, D.M. (2013). Myocardial ischemia-reperfusion injury: A neglected therapeutic target. *Journal of Clinical Investigation*, 123 : 92–100.
- Hirata, Y. (2018). Cardiopulmonary bypass for pediatric cardiac surgery. *Gen. Thorac. Cardiovasc. Surg.*, 66 : 65–70.
- Hirsch, R., Dent, C. L., Wood, M. K., Huddleston, C. B., Mendeloff, E. N., Balzer, D. T., et al. (1998). Patterns and potential value of cardiac troponin i



- elevations after pediatric cardiac operations. *Ann. Thorac. Surg.*, 65 : 1394–1399.
- Huang, J., Gou, B., Rong, F., & Wang, W. (2020). Dexmedetomidine improves neurodevelopment and cognitive impairment in infants with congenital heart disease. *Per. Med.*, 17 : 33–41.
- Ickeringill, M., Shehabi, Y., Adamson, H., & Ruettimann, U. (2004). Dexmedetomidine infusion without loading dose in surgical patients requiring mechanical ventilation: haemodynamic effects and efficacy. *Anaesth. Intensive Care.*, 32 : 741–745.
- Idriss, H.T., & Naismith, J.H. (2000). TNF α and the TNF receptor superfamily: Structure-function relationship(s). *Microsc. Res. Tech.*, 50 : 184–195.
- Imura, H., Caputo, M., Parry, A., Pawade, A., Angelini, G., & Suleiman, M. (2001). Age-dependent and hypoxia-related differences in myocardial protection during pediatric open heart surgery. *Circulation.*, 103 : 1551–1556.
- Indonesian heart association (2019). *Penyakit Jantung Bawaan*. Available at: http://www.inaheart.org/education_for_patient/2019/7/10/penyakit_jantung_bawaan. (Accessed: 24 May 2021).
- Jabbari, A., Banihashem, N., Alijanpour, E., Vafaey, H.R., Alereza, H., & Rabiee, S.M. (2013). Serum lactate as a prognostic factor in coronary artery bypass graft operation by on pump method. *Caspian J. Intern. Med.*, 4 : 662–666.
- Ji, X., Guo, Y., Zhou, G., Wang, Y., Zhang, J., Wang, Z., et al. (2019). Dexmedetomidine protects against high mobility group box 1-induced cellular injury by inhibiting pyroptosis. *Cell Biol. Int.*, 43 : 651–657.
- Johnson, T.A., Jinnah, H.A., & Kamatani, N. (2019). Shortage of cellular ATP as a cause of diseases and strategies to enhance ATP. *Front. Pharmacol.*, 10 : 1–19.
- Kadam, S.V., Tailor, K.B., Kulkarni, S., Mohanty, S.R., Joshi, P.V., & Rao, S.G. (2015). Effect of dexmeditomidine on postoperative junctional ectopic tachycardia after complete surgical repair of tetralogy of Fallot: a prospective randomized controlled study. *Ann. Card. Anaesth.*, 18 : 323–328.
- Kamatani, N. (2017). Clinical studies on changes in purine compounds in blood and urine by the simultaneous administration of febuxostat and inosine, or by single administration of each. *Gout Nucleic Acid Metab.*, 41 : 171–181.
- Kamenshchikov, N. O., Duong, N., & Berra, L. (2023). Nitric Oxide in Cardiac Surgery: A Review Article. *Biomedicines.*, 11 : 1–29.
- Kaplan, J. A. (2017). Systemic inflammation. In : Whitlock, R., & Guerrero, E. B (Eds.), *Kaplan's Cardiac Anesthesia for Cardiac and Noncardiac Surgery* 7th Ed., pp. 231-246. Philadelphia: Elsevier, USA.
- Kaplan, J. A. (2018). Molecular and genetic cardiovascular medicine and systemic inflammation. In : Fox, A. A., Sharma. S., Moinsey, J. A., Durieux, M. E., Whitlock, R., & Guerrero, E. B. (Eds.), *Kaplan's Essentials of Cardiac Anesthesia for Cardiac Surgery* 2nd Ed., pp. 94-111 . Philadelphia: Elsevier, USA.
- Khalil, H., Ahmed, I., Saleem, K., Younas, U., Afridi, I., Tayyub, F., et al. (2017). A comparative study of cyanotic & acyanotic patients outcomes in a



- postoperative intensive care unit at AFIC/NIHD. *Pak. Armed Forces Med.*, 67 : pS221–p226.
- Kim, E. H., Lee, J. H., Kim, H. S., Jang, Y. E., Ji, S. H., Kim, W. H., et al. (2020). Effects of intraoperative dexmedetomidine on the incidence of acute kidney injury in pediatric cardiac surgery patients: A randomized controlled trial. *Pediatr. Anesth.*, 30 : 1132-1138.
- Kindt, T. J., Goldsby, R. A., Osborne B. A., & Kuby, J. (2007). Overview of the immune system. In : Freeman, W. H. (Ed.), *Kuby Immunology* 6th Ed., pp. 1-23. New York: W.H. Freeman, USA.
- Kiski, D., Malec, E., & Schmidt, C. (2019). Use of dexmedetomidine in pediatric cardiac anesthesia. *Curr. Opin. Anaesthesiol.*, 32 : 334–342.
- Klabunde, R. E. (2012). Cellular structure and function. In : Taylor, C. (Ed.), *Cardiovascular Physiology Concepts* 2nd Ed., pp. 41-152. Baltimore: Lippincott Williams & Wilkins, USA.
- Klamt, J. G., Vincente W. V. A., Garcia, L. V., & Ferreira, C. A. (2010). Hemodynamic effects of the combination of dexmedetomidine-fentanyl versus midazolam-fentanyl in children undergoing cardiac surgery with cardiopulmonary bypass. *Rev. Bras. Anestesiol.*, 60 : 350–362.
- Kliegman, R. M., Geme J. W. S. T., Blum, N. J., Shah, S. S., Tasker, R. C., Wilson K. M., et al. (2019). Assessment of fetal growth and development . In : Feigelman, S., & Finkelstein, L. S. (Eds.), *Nelson Textbook of Pediatrics* 21st Ed., pp. 1106-1107. Philadelphia: Elsevier, USA.
- Kloner, R.A. (2020). Stunned and hibernating myocardium: where are we nearly 4 decades later?. *J. Am. Heart Assoc.*, 9 : 1–11.
- Kofsky, E., Julia, P., Buckberg, G.D., Young, H., & Tixier, D. (1991). Studies of myocardial protection in the immature heart. V. Safety of prolonged aortic clamping with hypocalcemic glutamate/aspartate blood cardioplegia. *J. Thorac. Cardiovasc. Surg.*, 101 : 33–43.
- Krispinsky, L.T., Stark, R.J., Parra, D.A., Luan, L., Bichell, D.P., Pietsch, J.B., et al. (2019). Endothelial-dependent vasomotor dysfunction in infants after cardiopulmonary bypass. *Pediatr. Crit. Care.*, 21 : 42–49.
- Kumar, M., Sharma, R., Sethi, S., Bazaz, S., Sharma, P., Bhan, A., et al. (2014). Vasoactive Inotrope Score as a tool for clinical care in children post cardiac surgery. *Indian J. Crit. Care Med.*, 18 : 653–658.
- Kunisawa, T., Ueno, M., Kurosawa, A., Nagashima, M., Hayashi, D., Sasakawa, T., et al. (2011). Dexmedetomidine can stabilize hemodynamics and spare anesthetics before cardiopulmonary bypass. *J. Anesth.*, 25 : 818–822.
- Laurindo, F. R. M., Liberman, M., Fernandes, D. C., & Leite, P. F. (2018). Endothelium-dependent vasodilation: nitric oxide and other mediators. In : Luz, P.L.D., Libby, P., Chagas, A.C.P., Laurindo, F.R.M. (Eds.), *Endothelium and Cardiovascular Diseases: Vascular Biology and Clinical Syndromes.*, pp. 97–113. Massachusetts USA: Academic Press.
- Lempiäinen, J., Finckenberg, P., Mervaala, E. E., Storvik, M., Kaivola, J., Lindstedt, K., et al. (2014). Dexmedetomidine preconditioning ameliorates kidney ischemia-reperfusion injury. *Pharmacol. Res. and Perspect.*, 2 : 1–15.



- Li, B., Chen, R., Huang, R., & Luo, W. (2009). Clinical benefit of cardiac ischemic postconditioning in corrections of tetralogy of Fallot, *Interact. Cardiovasc. Thorac. Surg.*, 8 : 17–21.
- Li, B., Li, Y., Tian, S., Wang, H., Wu, H., Zhang, A., & Gao, C. (2015). Anti-inflammatory effects of perioperative dexmedetomidine administered as an adjunct to general anesthesia: A meta-analysis. *Scientific Reports.*, 5: 1-9.
- Li, A., Yuen, V. M., Goulay-Dufaÿ, S., Sheng, Y., Standing, J. F., Kwok, P. C. L., et al. (2018). Pharmacokinetic and pharmacodynamic study of intranasal and intravenous dexmedetomidine. *British journal of Anaesthesia.*, 120 : 960-968
- Luo, W., Li, B., Lin, G., & Huang, R. (2007). Postconditioning in cardiac surgery for tetralogy of Fallot. *J Thorac. Cardiovasc. Surg.*, 133 : 1.373–1.374.
- Lilly, L. S. (2016). Ischemic Heart Disease. In : Wilder, J., Sabatine, M. S., Lilly, L. S. (Eds.), *Pathophysiology of Heart Disease* 6th Ed., pp. 134-177. Philadelphia: Wolters Kluwer, USA.
- Lippi, G., & Plebani, M. (2019). Understanding cardiac troponin biology: all other cardiac biomarkers shall rest in peace?. *J. Lab. Precis. Med.*, 4 : 9–9.
- Liu, Y., Bian, W., Liu, P., Zang, X., Gu, X., & Chen, W. (2018). Dexmedetomidine improves the outcomes in paediatric cardiac surgery: A meta-analysis of randomized controlled trials. *Interact. Cardiovasc. Thorac. Surg.*, 26 : 852–858.
- Lopaschuk, G.D. (2016). Metabolic changes in the acutely ischemic heart. *Heart Metabol.*, 70 : 32–35.
- Maiti and Bidinger (2019). Cardiovascular physiology and pharmacology. In : Gayeski, T. E. J. (Eds), *Hensley's Practical Approach to Cardiothoracic Anesthesia* 6th Ed., pp. 23-30. Philadelphia : Wolters Kluwer Health, USA.
- Manganelli, V., Signore, M., Pacini, I., Misasi, R., Tellan, G., Garofalo, T., et al. (2010). Increased HMGB1 expression and release by mononuclear cells following surgical/anesthesia trauma. *Critical Care.*, 14: 197.
- Meregalli, A., Oliveira, R.P., & Friedman, G. (2004). Occult hypoperfusion is associated with increased mortality in hemodynamically stable, high-risk, surgical patients. *Critical Care (London, England)*., 8 : 60–65
- Margraf, A., Ludwig, N., Alexander, Z., dan Rossaint, J. (2020). Systemic inflammatory response syndrome after surgery: mechanisms and protection. *Anesth. Analg.*, 131 : 1693–1707.
- McBride, W. T., Armstrong, M. A., Gilliland, H., & McMurray, T. J. (1996). The balance of pro and anti-inflammatory cytokines in plasma and bronchoalveolar lavage (BAL) at paediatric cardiac surgery. *Cytokine.*, 8 : 724–729.
- Mescher, A. L. (2018). Muscle tissue. In : Weitz, M., & Kearns, B. (Eds.), *Junqueira's Basic Histology Text and Atlas*. 15th Ed., pp. 207-2017. New York: McGraw-Hill Education.
- Michie, H. R., Manogue, K. R., Spriggs, D. R., Revhaug, A., & O'Dwyer, S. (1988). Detection of circulating tumor necrosis factor after endotoxin administration. *NEJM*, 318 : 1.481–1.486.



- Ming, S., Xie, Y., Du, X., Huang, H., Fan, Y., Liang, Q., *et al.* (2021). Effect of dexmedetomidine on perioperative hemodynamics and organ protection in children with congenital heart disease: a randomized controlled trial. *Medicine.*, 100 : 1–9
- Modi, P., Imura, H., Angelini, G. D., Pawade, A., Parry, A. J., Suleiman, M. S., *et al.* (2003). Pathology-related troponin I release and clinical outcome after pediatric open heart surgery. *J. Card. Surg.*, 18 : 295–300.
- Mohammed, A. A., Agnihotri, A. K., van Kimmenade, R. R. J., Martinez-Rumayor, A., Green, S., Quiroz, R., *et al.* (2009). Prospective, comprehensive assessment of cardiac troponin T testing after coronary artery bypass graft surgery. *Circulation.*, 120 : 843–850.
- Moore, K. L., Dalley, A. F., & Agur, A. M. R. (2018). Heart. in : Clements, J. (Ed.), *Moore Clinically Oriented Anatomy* 8th Ed., pp. 860-889. Philadelpia: Wolters Kluwer Health.
- Mukhtar, A. M., Obayah, E. M., & Hassona, A. M. (2006). The use of dexmedetomidine in pediatric cardiac surgery. *Anesth. Analg.*, 103 : 52–56.
- Murphy, K., Travers, P., Walport, M., & Janeway, C. (2012). The induced responses of innate immunity. in : Murphy, K. (Ed.), *Janeway's Immunobiology* 8th Ed., pp. 75-121. New York: Garland Science, USA.
- Naaz, S., & Ozair, E. (2014). Dexmedetomidine in current anaesthesia practice- a review. *J. Clin. Diagnostic Res.*, 8 : 1–4.
- Nasr, V. G., & DiNardo, J. A. (2017). Cardiovascular development. In : Nasr, V. G., & DiNardo, J. A. (Eds), *The Pediatric Cardiac Anesthesia Handbook.*, pp : 3-7. Chichester: John Wiley & Sons Ltd.
- Naguib, A. N., Tobias, J. D., Hall, M. W., Cismowski, M. J., Miao, Y., Barry, N., *et al.* (2013). The role of different anesthetic techniques in altering the stress response during cardiac surgery in children: a prospective, double-blinded, and randomized study. *Pediatr. Crit. Care Med.*, 14 : 481–490.
- Negi, S. L., Mandal, B., Singh, R. S., & Puri, G. D. (2019). Myocardial protection and clinical outcomes in Tetralogy of Fallot patients undergoing intracardiac repair: a randomized study of two cardioplegic techniques. *Perfusion (United Kingdom)*, 34 : 495–502.
- Nichols, D., & Shaffner, D. (2016). Cardiac anatomy. In : Schwantz, S. M., Slavik, Z., & Ho, S. Y. (Eds.), *Rogers' Textbook of Pediatric Intensive Care* 5th Ed., pp. 1078-1087. Philadelphia: Wolters Kluwer, USA.
- Noly, P.E., Dorfmuller, P., Fadel, E., & Mercier, O. (2018). Capillary Density in right ventricular myocardium in congenital heart disease. *J. Heart Lung Transplant.*, 38: 328-331.
- Ödek, Ç., Kendirli, T., Uçar, T., Yaman, A., Tutar, E., Eyileten, Z., *et al.* (2016). Predictors of early extubation after pediatric cardiac surgery: a single-center prospective observational study. *Pediatr. Cardiol.*, 37 : 1241–1249.
- O'Connor, E. dan Fraser, J.F., (2012). The interpretation of perioperative lactate abnormalities in patients undergoing cardiac surgery. *Anaesth. Intensive Care.*, 40 : 598-603.
- Palta, S., Saroa, R., & Palta, A. (2014). Overview of the coagulation system. *Indian J. Anaesth.*, 58 : 515–523.



- Pan, W., Wang, Y., Lin, L., Zhou, G., Hua, X., & Mo, L. (2016). Outcomes of dexmedetomidine treatment in pediatric patients undergoing congenital heart disease surgery: a meta-analysis. *Paediatr. Anaesth.*, 26 : 239–248.
- Park, M. K., & Salamat, M. (2020). Pathophysiology of cyanotic congenital heart defects. In : 112-175. Park, M. K., & Salamat, M. (Eds.), *Park's Pediatric Cardiology for Practitioners* 7th Ed., pp. 107-175. Philadelphia: Elsevier Science, USA.
- Parr, G. V., Blackstone, E. H., & Kirklin, J. W. (1975). Cardiac performance and mortality early after intracardiac surgery in infants and young children. *Circulation*, 51 : 867–874.
- Patel, N., Durland, J., Makaryus, A.N. (2022). Physiology, Cardiac Index. In : StatPearls (Ed.), *NCBI bookshelf.*, pp. 1-6. Treasure Islands: StatPearls Publishing LLC.
- Phan, H., & Nahata, M.C. (2008). Clinical uses of dexmedetomidine in pediatric patients. *Pediatr. Drugs.*, 10 : 49–69.
- Potts, A.L., Anderson, B.J., Warman, G.R., Lerman, J., Diaz, S.M., & Vilo, S. (2009). Dexmedetomidine pharmacokinetics in pediatric intensive care - a pooled analysis. *Paediatr. Anaesth.*, 19 : 1119–1129.
- Prasad, S.R., Simha, P.P., & Jagadeesh, A.M. (2012). Comparative study between dexmedetomidine and fentanyl for sedation during mechanical ventilation in post-operative paediatric cardiac surgical patients. *Indian J. Anaesth.*, 56 : 547-552.
- Prondzinsky, R., Knupfer, A., Loppnow, H., Redling, F., Lehmann, D.W., Stabenow, I., et al. (2005). Surgical trauma affects the proinflammatory status after cardiac surgery to a higher degree than cardiopulmonary bypass. *J. Thorac. Cardiovasc. Surg.*, 129 : 760-766.
- Puchinger, J., Ryz, S., Nixdorf, L., Edlinger-Stander, M., Lassnigg, A., Wiedemann, D., et al. (2022). Characteristics of interleukin-6 signaling in elective cardiac surgery-a prospective cohort study. *J. Clin. Med.*, 11 : 590-602.
- Qiu, Y., Li, C., Li, X., dan Jia, Y. (2020). Effects of dexmedetomidine on the expression of inflammatory factors in children with congenital heart disease undergoing intraoperative cardiopulmonary bypass: a randomized controlled trial. *Pediatr. Investig.*, 1 : 23-28.
- Rahimtoola, S. H. (1982). Coronary bypass surgery for chronic angina—1981. A perspective. *Circulation*, 65 : 225–241.
- Rajput, R. S., Das, S., Makhija, N., & Airan, B. (2014). Efficacy of dexmedetomidine for the control of junctional ectopic tachycardia after repair of tetralogy of Fallot. *Ann. Pediatr. Cardiol.*, 7 : 167-172.
- Raman, J. S., Sinaldo, B., Hayhoe, M., Tsamitros, M., & Buxton, B. F. (2001). Metabolic changes and myocardial injury during cardioplegia: a pilot study. *Ann. Thorac. Surg.*, 72 : 1566-1571.
- Ranucci, M., Isgrò, G., Carlucci, C., De La Torre, T., Enginoli, S., & Frigola, A. (2010). Central venous oxygen saturation and blood lactate levels during cardiopulmonary bypass are associated with outcome after pediatric cardiac surgery. *Crit. Care.*, 14 : 149-148.



- Raupach, A., Karakurt, E., Torregroza, C., Bunte, S., Feige, K., Stroethoff, M., et al. (2020). Dexmedetomidine provides cardioprotection during early or late reperfusion mediated by different mitochondrial K⁺-channels, *Anesth. Analg.*, 132 : 253–260.
- Rodwell, V. W., Bender, D.A., Botham, K.M., Kennelly, P.J., & Weil, P.A. (2018). The citric acid cycle : the central pathway of carbohydrate, lipid & amino acid metabolism. In : Bender, D. A., Mayes, P.A. (Eds.), *Harper's Illustrated Biochemistry* 31st Ed., pp. 382-411. United States : McGraw-Hill Education.
- Rooney, S.R., Mastropietro, C.W., Benneyworth, B., Graham, E.M., Klugman, D., Costello, J., et al. (2020). Influence of early extubation location on outcomes following pediatric cardiac surgery. *Pediatr. Crit. Care Med.*, 21 : 916-921.
- Roth, S., Torregroza, C., Huhn, R., Hollmann, M. W., & Preckel, B. (2020). Perioperative cardioprotection: clinical implications. *Anesth. Analg.*, 131 : 1751–1764.
- Ruesch, S., & Jerrold, L. (2002). Treatment of persistent tachycardia with dexmedetomidine during off-pump cardiac surgery. *Anaesth. Analg.*, 95 : 316–318.
- Sadler, T. W. (2019). Cardiovascular system. In : Sadler, T. W. (Ed.), *Langman's Medical Embryology* 14th Ed., pp. 179-222. Philadelphia: Wolters Kluwer, USA.
- Şahutoğlu, C., Yaşar, A., Kocababaş, S., Aşkar, F.Z., Ayık, M.F., & Atay, Y. (2018). Correlation between serum lactate levels and outcome in pediatric patients undergoing congenital heart surgery. *Turkish J. Thorac. Cardiovasc. Surg.*, 26 : 375-385.
- Sandoval, N., Carreño, M., Novick, W.M., Agarwal, R., Ahmed, I., Balachandran, R., et al. (2018). Tetralogy of Fallot repair in developing countries: international quality improvement collaborative. *Ann. Thorac. Surg.*, 106 : 1446-1451.
- Saikia, D., & Mahanta, B. (2019). Cardiovascular and respiratory physiology in children. *Indian J. Anaesth.*, 63 : 690–697.
- Schlensak, C. (2005). Myocardial protection in congenital heart surgery. *Multimed. Man. Cardiothorac. Surg.*, 2005 : pp. 6–10.
- Sharma, S., Jackson, P.G., & Makan, J. (2004). Cardiac troponins. *J. Clin. Pathol.*, 57 : 1025–1026.
- Sheikh, T.A., Dar, B.A., Akhter, N., dan Ahmad, N. (2018). A comparative study evaluating effects of intravenous sedation by dexmedetomidine and propofol on patient hemodynamics and postoperative outcomes in cardiac surgery. *Anesth. : Essays Res.*, 12 : 555-560.
- Sheikhi, M.A., Ebadi, A., Shahriary, A., Davoodzadeh, H., & Rahmani, H. (2015). Cardiac surgery anesthesia and systemic inflammatory response. *Int. J. Bioassays.*, 2 : 3648.
- Sherwood, L., (2021). Cardiac physiology. In : Sherwood, L (Ed.), *Human Physiology: From Cells to Systems* 4th Ed., pp. 345-375. Victoria: Cengage Learning, Australia.



- Smith, C.A., McCracken, C., Thomas, A.S., Spector, L.G., St Louis, J.D., Oster, M.E., Moller, J.H., Kochilas, L. (2018). Long-term outcomes of tetralogy of Fallot. *JAMA Cardiol.*, 4 : 34–41.
- Stephens, E.H., Epting, C.L., Backer, C.L., Wald, E.L. (2020). Hyperlactatemia: an update on postoperative lactate. *World J. Pediatr. Congenit. Heart Surg.*, 11 : 316–324.
- Su, J. A., Kumar, S. R., Mahmoud, H., Bowdish, M. E., Toubat, O., Wood, J. C., et al. (2020). Postoperative serum troponin trends in infants undergoing cardiac surgery. *Semin. Thorac. Cardiovasc. Surg.*, 31 : 244–251.
- Su, F., Nicolson, S. C. & Zuppa, A. F. (2013). A dose-response study of dexmedetomidine administered as the primary sedative in infants following open heart surgery. *Pediatr. Crit. Care Med.*, 14 : 499–507.
- Su, F., Gastonguay, M. R., Nicolson, S. C., Diliberto, M., Ocampo-Pelland, A., & Zuppa, A. F. (2016). Dexmedetomidine Pharmacology in Neonates and Infants after Open Heart Surgery. *Anesthesia and Analgesia.*, 122 : 1556–1566.
- Sun, Y., Jiang, C., Jiang, J. & Qiu, L. (2017). Dexmedetomidine protects mice against myocardium ischaemic/reperfusion injury by activating an ampk/pi3k/akt/enos pathway. *Clin. Exp. Pharmacol. Physiol.*, 44 : 946–953.
- Talwar, S., Keshri, V., Choudhary, S., & Airan, B. (2015). Myocardial protection in neonates and infants: what have we learnt? where do we go?. *J. Heart Circ.*, 1 : 1–7.
- Tanaka, T., Narazaki, M., & Kishimoto, T. (2014). IL-6 in inflammation, immunity, and disease. *Cold Spring Harb. Perspect. Biol.*, 6 : 1–16.
- Teoh, K. H. T., Bradley, C. A., Gauldie, J., & Burrows, H. (1995). Steroid inhibition of cytokine-mediated vasodilation after warm heart surgery. *Circulation.*, 92 : 347–353.
- Tissier, R., Ghaleh, B., Cohen, M. v., Downey, J.M., & Berdeaux, A. (2012). Myocardial protection with mild hypothermia. *Cardiovasc. Res.*, 94 : 217–225.
- Torregroza, C., Raupach, A., Feige, K., Weber, N.C., Hollmann, M.W., & Huhn, R. (2020). Perioperative cardioprotection: general mechanisms and pharmacological approaches. *Anesth. Analg.*, 131 : 1765–1780.
- Türker, G., Babaoğlu, K., Gökalp, A.S., Sarper, N., Zengin, E. & Arisoy, A.E. (2004). “Cord blood cardiac troponin I as an early predictor of short-term outcome in perinatal hypoxia”. *Biol. Neonate.*, 86 : 131–137.
- Turkoz, R. (2013). Myocardial Protection in Pediatric Cardiac Surgery. *Artif. Organs.*, 37 : 2 16–20.
- US Food and Drug Administration (1999). *Precedex label*. Available at: http://www.accessdata.fda.gov/drugsatfda_docs/label/1999/21038lbl.pdf f. (Accessed: 14 Nov 2016).
- Välijalo, P. A., Ahtola-Sätilä, T., Wighton, A., Sarapohja, T., Pohjanjousi, P., & Garratt, C. (2013). Population pharmacokinetics of dexmedetomidine in critically Ill patients. *Clin. Drug Investig.*, 33 : 579–587.
- Vernon, C. dan LeTourneau, J. L. (2010). Lactic acidosis, recognition, kinetics, and associated prognosis. *Crit. Care Clin.*, 26 : 255-283.



- Villa, A.D., Sammut, E., Nair, A., Rajani, R., Bonamini, R., & Chiribiri, A. (2016). Coronary artery anomalies overview: the normal and the abnormal. *World J. Radiol.*, 8 : 537.
- Vinten-Johansen, J., & Thourani, V.H. (2000). Myocardial protection: an overview. *J. Extra Corpor. Technol.*, 32 : 38–48.
- Wada, T., Yokozawa, M., Takamuro, M., Araki, D., Ebuoka, N., Ohba, J., et al. (2018). Cardiac troponin I and perioperative factors in pediatric open heart surgery. *Sapporo Med. J.*, 87 : 25–33.
- Walsh, M., Whitlock, R., Gard, A. X., Légaré, J. F., Duncan, A. E., Zimmerman, R., et al. (2016). Effects of remote ischemic preconditioning in high-risk patients undergoing cardiac surgery (Remote IMPACT): a randomized controlled trial. *CMAJ.*, 188 : 329–336.
- Wang, L., Wang, S., Xing, Z., Li, F., Teng, J., & Jia, T. (2020). Application of dexmedetomidine in cardiopulmonary bypass prefilling. *Dose-Response.*, 18 : 1–5.
- Wang, N., & Wang, M. (2019). Dexmedetomidine suppresses sevoflurane anesthesia-induced neuroinflammation through activation of the PI3K/Akt/mTOR pathway. *BMC Anesthesiol.*, 19 : 1–9.
- Warren, O. J., Smith, A. J., Alexiou, C., Rogers, P. L. B., Jawad, N., Vincent, C., et al. (2009). The inflammatory response to cardiopulmonary bypass: part 1-mechanisms of pathogenesis. *J. Cardiothorac. Vasc. Anesth.*, 23 : 223–231.
- Weerink, M. A. S., Struys, M. M. R. F., Hannivoort, L. N., Barends, C. R. M., Absalom, A. R., & Colin, P. (2017). Clinical pharmacokinetics and pharmacodynamics of dexmedetomidine. *Clin. Pharmacokinet.*, 56 : 893–913.
- Wernovsky, G., Wypij, D., Jonas, R. A., Mayer, J. E., Hanley, F. L., Hickey, P. R., et al. (1995). Postoperative course and hemodynamic profile after the arterial switch operation in neonates and infants. A comparison of low-flow cardiopulmonary bypass and circulatory arrest. *Circulation.*, 92 : 2.226–2.235
- Wijeysundera, D. N., Naik, J. S., & Beattie, W. S. (2003). Alpha-2 adrenergic agonists to prevent perioperative cardiovascular complications: a meta-analysis. *Am. J. Med.*, 114 : 742–752.
- Wu, W., He, J., & Shao, X. (2020). Incidence and mortality trend of congenital heart disease at the global, regional, and national level, 1990–2017. *Medicine (Baltimore)*, 99 : 1–8.
- Ying, L., Benjanuwattra, J., Chattipakorn, S. C., & Chattipakorn, N. (2020). The role of RIPK3-regulated cell death pathways and necroptosis in the pathogenesis of cardiac ischaemia-reperfusion injury. *Acta Physiol. (Oxf.)*, 231 : 1–26.
- Yu, T., Liu, D., Gao, M., Yang, P., Zhang, M., Song, F., et al. (2019). Dexmedetomidine prevents septic myocardial dysfunction in rats via activation of α 7nAChR and PI3K/Akt-mediated autophagy. *Biomed. Pharmacother.*, 120 : 1–9.



- Yuan, S. M., & Lin, H. Z. (2017). Interleukin-6 in cardiac surgery. *Periodicum Biologorum*, 119 : 93–99.
- Yuki, K. (2021). The immunomodulatory mechanism of dexmedetomidine. *Int. Immunopharmacol.*, 97 : 1-7.
- Xia, Z., Li, H., & Irwin, M. G. (2016). Myocardial ischaemia reperfusion injury: the challenge of translating ischaemic and anaesthetic protection from animal models to humans. *Br. J. Anaesth.*, 117 : 44–62.
- Zhang, J., Xia, F., Zhao, H., Peng, K., Liu, H., Meng, X., et al. (2019). Dexmedetomidine-induced cardioprotection is mediated by inhibition of high mobility group box-1 and the cholinergic anti-inflammatory pathway in myocardial ischemia-reperfusion injury. *PLoS ONE.*, 14 : 1–18.
- Zhang, J.J., Peng, K., Zhang, J., Meng, X.W., & Ji, F.H. (2017). Dexmedetomidine preconditioning may attenuate myocardial ischemia/reperfusion injury by down-regulating the HMGB1-TLR4- MyD88-NF- κ B signaling pathway. *PLoS ONE.*, 12 : 1–15.
- Zhang, Y., Yi, D., Xiao, G., Wang, W., Lin, W., Zeng, H., Deng, J., et al. (2018). Myocardial protection effects of dexmedetomidine priming on cardiopulmonary bypass surgery for children with congenital heart disease. *Int. J. Clin. Exp. Med.*, 11 : 975–981.
- Zhou, H., Zhou, D., Lu, J., Wu, C., & Zhu, Z. (2019). Effects of pre-cardiopulmonary bypass administration of dexmedetomidine on cardiac injuries and the inflammatory response in valve replacement surgery with a sevoflurane postconditioning protocol: a pilot study. *J. Cardiovasc. Pharmacol.*, 74 : 91–97.
- Zi, S. F., Li, J. H., Liu, L., Deng, C., Ao, X., Chen, D., et al. (2019). Dexmedetomidine-mediated protection against septic liver injury depends on TLR4/MyD88/NF- κ B signaling downregulation partly via cholinergic anti-inflammatory mechanisms. *Int. Immunopharmacol.*, 76 : 105898.
- Zimmerman, K. O., Wu, H., Laughon, M., Greenberg, R. G., Walczak, R., Schulman, S. R., et al. (2019). Dexmedetomidine pharmacokinetics and a new dosing paradigm in infants supported with cardiopulmonary bypass. *Anesth. Analg.*, 129 : 1519–1528.
- Zuppa, A. F., Nicolson, S. C., Wilder, N. S., Ibla, J. C., Gottlieb, E. A., Burns, K. M., et al. (2019). Results of a phase 1 multicentre investigation of dexmedetomidine bolus and infusion in corrective infant cardiac surgery. *Br. J. Anaesth.*, 123 : 839–852.