

DAFTAR PUSTAKA

- Abbas, A., Lichtman, A., 2004. Cellular and Molecular Immunology. Eighth Edition. WB Saunders Comp.
- Alobaidi, R., Basu, R.K., Goldstein, S.L., Bagshaw, S.M., 2015. Sepsis-Associated Acute Kidney Injury. *Semin. Nephrol.* 35, 2–11.
- Andreoli, S.P., 2009. Acute kidney injury in children. *Pediatr. Nephrol.* 24, 253–263.
- Angus, C., Poll, 2013. Severe Sepsis and Septic Shock. *N. Engl. J. Med.* 369, 840–849.
- Ba Aqeel, S.H., Sanchez, A., Batlle, D., 2017. Angiotensinogen as a biomarker of acute kidney injury. *Clin. Kidney J.* 10, 759–768.
- Brookes EM, Power DA. Elevated serum urea-to-creatinine ratio is associated with adverse inpatient clinical outcomes in non-end stage chronic kidney disease. *Sci Rep.* 2022 Dec 2;12(1):20827. doi: 10.1038/s41598-022-25254-7. PMID: 36460694; PMCID: PMC9718835.
- Carcillo, J.A., 2003. Pediatric septic shock and multiple organ failure. *Crit. Care Clin.* 19, 413–440.
- Ciccia, E., Devarajan, P., 2017. Pediatric acute kidney injury: Prevalence, impact and management challenges. *Int. J. Nephrol. Renovasc. Dis.* 10, 77–84.
- Chen L, Wu X, Qin H, Zhu H. The PCT to Albumin Ratio Predicts Mortality in Patients With Acute Kidney Injury Caused by Abdominal Infection- Evoked Sepsis. *Front Nutr.* 2021 Jun 1;8:584461. doi: 10.3389/fnut.2021.584461. PMID: 34141715; PMCID: PMC8203818.
- Chisti MJ, Salam MA, Bardhan PK, Faruque AS, Shahid AS, Shahunja KM, Das SK, Hossain MI, Ahmed T. Severe Sepsis in Severely Malnourished Young Bangladeshi Children with Pneumonia: A Retrospective Case Control Study. *PLoS One.* 2015 Oct 6;10(10):e0139966. doi: 10.1371/journal.pone.0139966. PMID: 26440279; PMCID: PMC4595075.



., Chung, W., Kim, A.J. *et al.* Association between acute kidney injury and serum procalcitonin levels and their diagnostic usefulness

in critically ill patients. *Sci Rep* 9, 4777 (2019).
<https://doi.org/10.1038/s41598-019-41291-1>

Dellinger, R.P., Levy, M., Rhodes, A., Annane, D., Gerlach, H., Opal, S.M., Sevransky, J.E., Sprung, C.L., Douglas, I.S., Jaeschke, R., Osborn, T.M., Nunnally, M.E., Townsend, S.R., Reinhart, K., Kleinpell, R.M., Angus, D.C., Deutschman, C.S., Machado, F.R., Rubenfeld, G.D., Webb, S.A., Beale, R.J., Vincent, J.L., Moreno, R., Aitken, L., Al Rahma, H., Bernard, G.R., Bion, J.F., Biban, P., Calandra, T., Carcillo, J.A., Clemmer, T.P., Divatia, J. V., Fujishima, S., Du, B., Gando, S., Guyatt, G., Goodyear-Bruch, C., Hazelzet, J.A., Hollenberg, S.M., Hirasawa, H., Jacobi, J., Kacmarek, R.M., Jenkins, I., Jimenez, E., Jones, A.E., Kern, W., Koh, S.O., Kotani, J., Machado, F., Marini, J., Marshall, J.C., Masur, H., Mehta, S., Muscedere, J., Napolitano, L.M., Parker, M.M., Parrillo, J.E., Qiu, H., Randolph, A.G., Rello, J., Resende, E., Rivers, E.P., Schorr, C.A., Shukri, K., Silva, E., Soth, M.D., Thompson, A.E., Vender, J.S., Welte, T., Zimmerman, J.L., 2013. Surviving sepsis campaign: International guidelines for management of severe sepsis and septic shock: 2012. *Crit. Care Med.* 41, 580–637.

Ding, J., Song, D., Xiaobing, Y., Liu, S., 2009. A Pivotal Role of Endothelial-specific NF- κ B Signaling in the Pathogenesis of Septic Shock and Septic Vascular Dysfunction. *J Immunol* 183, 4031–4038.

Doradla, L.P.S., Prasad, N., 2016. Pathophysiology of sepsis-associated AKI [SA-AKI]. *Clin. Queries Nephrol.* 5, 21–25.

Doyle, J., Forni, L., 2016. Update on sepsis-associated acute kidney injury: emerging targeted therapies. *Targets Ther. Dove Press J.* 10, 149–156.

David A. Long, Karen L. Price, Jaime Herrera-Acosta and Richard J. Johnson. How Does Angiotensin II Cause Renal Injury?. *Hypertension.* 2004;43:722–723.
<https://doi.org/10.1161/01.HYP.0000120964.22281.3e>

Endre, Z.H., Pickering, J.W., Walker, R.J., Devarajan, P., Edelstein, C.L., Bonventre, J. V., Frampton, C.M., Bennett, M.R., Ma, Q., Sabbisetti, V.S., Vaidya, V.S., Walcher, A.M., Shaw, G.M., Henderson, S.J., Nejat, M., Schollum, J.B.W., George, P.M., 2011. Improved performance of urinary biomarkers of acute kidney injury in the critically ill by stratification for injury duration and baseline renal function. *Kidney Int.* 79, 1119–1130.



.M.S., Bresolin, N.L., Farah, A.C.F., Carvalho, F.L.C., Góes, J.E.C., 2010. Acute kidney injury in children: incidence and prognostic

factors in critical ill patients Article. Rev Bras Ter Intensiva 22, 166–174.

Fitzgerald JC, Basu RK, Akcan-Arikan A, Izquierdo LM, Piñeres Olave BE, Hassinger AB, Szczepanska M, Deep A, Williams D, Sapru A, Roy JA, Nadkarni VM, Thomas NJ, Weiss SL, Furth S; Sepsis PRevalence, OUtcomes, and Therapies Study Investigators and Pediatric Acute Lung Injury and Sepsis Investigators Network. Acute Kidney Injury in Pediatric Severe Sepsis: An Independent Risk Factor for Death and New Disability. Crit Care Med. 2016 Dec;44(12):2241-2250. doi: 10.1097/CCM.0000000000002007. PMID: 27513354; PMCID: PMC5267552.

Formeck CL, Joyce EL, Fuhrman DY, Kellum JA. Association of Acute Kidney Injury With Subsequent Sepsis in Critically Ill Children. Pediatr Crit Care Med. 2021 Jan 1;22(1):e58-e66. doi: 10.1097/PCC.0000000000002541. PMID: 32858738; PMCID: PMC7790909.

Giamarellos-Bourboulis, E.J., Opal, S.M., 2016. The role of genetics and antibodies in sepsis. Ann. Transl. Med. 4.

Godi, I., De Rosa, S., Martino, F., Bazzano, S., Martin, M., Boni, E., Carta, M.R., Tamayo Diaz, C., Mari, G., Lorenzin, A., de Cal, M., Corradi, V., Caprara, C., Giavarina, D., Ronco, C., 2020. Urinary [TIMP-2] × [IGFBP7] and serum procalcitonin to predict and assess the risk for short-term outcomes in septic and non-septic critically ill patients. Ann. Intensive Care 10.

Gotts, J.E., Matthay, M.A., 2016. Sepsis: Pathophysiology and clinical management. BMJ 353.

Gupta, M., 2010. Vasoactive Substances As Mediators of Renal Injury.

Güzel C, Yeşiltaş S, Daşkaya H, Uysal H, Sümer I, Türkay M. The effect of gender on acute kidney injury developing in the intensive care unit. Hippokratia. 2019 Jul-Sep;23(3):126-130. PMID: 32581498; PMCID: PMC7307507.

Han, W., Abichandani, V., Thadhani, R., Bonventre, J., 2002. Kidney Injury Molecule-1 (KIM-1): A novel biomarker for human renal proximal tubule injury. Kidney Int. 62, 237–244.



l, M.E., Linde-Zwirble, W.T., Angus, D.C., Watson, R.S., 2013. Trends in the epidemiology of pediatric severe sepsis. Pediatr. Crit. Care Med. 14, 686–693.

Hepokoski, M.L., Malhotra, A., Singh, P., Crotty Alexander, L.E., 2018. Ventilator-induced kidney injury: Are novel biomarkers the key to prevention? *Nephron* 140, 90–93.

Hotchkiss, R.S., Moldawer, L.L., Opal, S.M., Reinhart, K., Turnbull, I.R., Vincent, J.L., 2016. Sepsis and septic shock. *Nat. Rev. Dis. Prim.* 2.

Huang HL, Nie X, Cai B, Tang JT, He Y, Miao Q, Song HL, Luo TX, Gao BX, Wang LL, Li GX. Procalcitonin levels predict acute kidney injury and prognosis in acute pancreatitis: a prospective study. *PLoS One*. 2013 Dec 13;8(12):e82250. doi: 10.1371/journal.pone.0082250. PMID: 24349237; PMCID: PMC3862675.

Ikatan Dokter Anak Indonesia, 2016. *Diagnosis dan Tatalaksana sepsis pada anak*. Balai penerbit IDAI, Jakarta.

Kalil, A., 2016. Septic Shock [WWW Document]. URL available: <http://emedicine.medscape.com/article/168402-overview>. Last accessed 29th May 2017.

Kashani, K., Al-Khafaji, A., Ardiles, T., Artigas, A., Bagshaw, S.M., Bell, M., Bihorac, A., Birkhahn, R., Cely, C.M., Chawla, L.S., Davison, D.L., Feldkamp, T., Forni, L.G., Gong, M.N., Gunnerson, K.J., Haase, M., Hackett, J., Honore, P.M., Hoste, E.A.J., Joannes-Boyau, O., Joannidis, M., Kim, P., Koyner, J.L., Laskowitz, D.T., Lissauer, M.E., Marx, G., McCullough, P.A., Mullaney, S., Ostermann, M., Rimmelé, T., Shapiro, N.I., Shaw, A.D., Shi, J., Sprague, A.M., Vincent, J.L., Vinsonneau, C., Wagner, L., Walker, M.G., Wilkerson, R.G., Zacharowski, K., Kellum, J.A., 2013. Discovery and validation of cell cycle arrest biomarkers in human acute kidney injury. *Crit. Care* 17, 1–12.

Kawasaki, T., 2017. Update on pediatric sepsis: A review. *J. Intensive Care* 5, 1–12.

Kellum, J.A., Chawla, L.S., 2016. Cell-cycle arrest and acute kidney injury: The light and the dark sides. *Nephrol. Dial. Transplant.* 31, 16–22.

Kellum, J.A., Romagnani, P., Ashuntantang, G., Ronco, C., Zarbock, A., Anders, H.J., 2021. Acute kidney injury. *Nat. Rev. Dis. Prim.* 7.

Koshy, S.M., Geary, D.F., 2008. Anemia in children with chronic kidney disease. *Pediatr. Nephrol.* 23, 209–219.



, N., Van Biesen, W., Vanholder, R., 2017. Epidemiology of acute kidney injury in children worldwide, including developing countries. *Pediatr. Nephrol.* 32, 1301–1314.

- Legrand, M., Bokoch, M.P., 2021. The Yin and Yang of the renin–Angiotensin–aldosterone system in acute kidney injury. *Am. J. Respir. Crit. Care Med.* 203, 1053–1055.
- Marcianti AB, Shell B, Farmer GE, Cunningham JT. Role of angiotensin II in chronic intermittent hypoxia-induced hypertension and cognitive decline. *Am J Physiol Regul Integr Comp Physiol.* 2021 Apr 1;320(4):R519-R525. doi: 10.1152/ajpregu.00222.2020. Epub 2021 Feb 17. PMID: 33595364; PMCID: PMC8238144.
- Leisman, D.E., Fernandes, T.D., Bijol, V., Abraham, M.N., Lehman, R., Taylor, M.D., Capone, C., Yaipan, O., Deutschman, C.S., Hospital, M.G., Hospital, M.G., Park, N.H., Hospital, A., Hospital, A., 2021. Impaired Angiotensin II type 1 receptor signaling contributes to sepsis-induced acute kidney injury. *Kidney Int.* 99, 148–160.
- Li, S., Krawczeski, C.D., Zappitelli, M., Devarajan, P., Thiessen-Philbrook, H., Coca, S.G., Parikh, C.R., 2011. Incidence, risk factors, and outcomes of acute kidney injury after pediatric cardiac surgery: A prospective multicenter study. *Crit. Care Med.* 39, 1493– 1499.
- Li, Y.-M., Zhang, J., Al., E., 2018. 18. Downregulation of TIMP2 attenuates sepsis-induced AKI through the NF-kb pathway. *BBA - Mol. Basis Dis.*
- Liu, P., Stenger, S., Li, H., Wenzel, L., Tan, B., Krutzik, S., Al., E., 2006. Toll-like receptor triggering of a vitamin D-mediated human antimicrobial response. *Science* (80-.). 311, 1770–3.
- Liu, Y., Lin, Y., Zhang, M.M., Li, X.H., Liu, Y.Y., Zhao, J., Shi, L., 2020. The relationship of plasma renin, Angiotensin, and aldosterone levels to blood pressure variability and target organ damage in children with essential hypertension. *BMC Cardiovasc. Disord.* 20, 1–7.
- Long, D.A., Price, K.L., Herrera-Acosta, J., Johnson, R.J., 2004. How Does Angiotensin II Cause Renal Injury? *Hypertension* 43, 722–723.
- Makris, K., Spanou, L., 2016. Lesion Renal Aguda Otro. *Clin. Biochem. Rev.* 37, 85–98.
- Mathias, B., Mira, J.C., Larson, S.D., 2016. Pediatric sepsis. *Curr. Opin. Pediatr.* 28, 380–387.



ka, T., Niimura, F., Shimizu, A., Pastan, I., Saito, A., Kobori, H., Ishiyama, A., Ichikawa, I., 2012. Liver Angiotensinogen is the primary source of renal Angiotensin II. *J. Am. Soc. Nephrol.* 23, 1181–1189.

- McCaffrey, J., Dhakal, A.K., Milford, D. V., Webb, N.J.A., Lennon, R., 2017. Recent developments in the detection and management of acute kidney injury. *Arch. Dis. Child.* 102, 91–96.
- Molitoris BA. Measuring glomerular filtration rate in acute kidney injury: yes, but not yet. *Crit Care.* 2012 Sep 24;16(5):158. doi: 10.1186/cc11482. PMID: 23014799; PMCID: PMC3682250.
- Neugarten, J., Golestaneh, L., Kolhe, N. V., 2018. Sex differences in acute kidney injury requiring dialysis. *BMC Nephrol.* 19, 1–7.
- Nilawati, G., 2012. Kejadian Acute Kidney Injury dengan Kriteria pRIFLE pada Unit Perawatan Intensif Anak Rumah Sakit Sanglah Denpasar. *Sari Pediatr.* 14, 158–161.
- Naik S, Sharma J, Yengkom R, Kalrao V, Mulay A. Acute kidney injury in critically ill children: Risk factors and outcomes. *Indian J Crit Care Med.* 2014 Mar;18(3):129-33. doi: 10.4103/0972-5229.128701. PMID: 24701061; PMCID: PMC3963194.
- Nie, X., Wu, B., He, Y., Huang, X., Dai, Z., Miao, Q., ... Li, G. (2013). *Serum procalcitonin predicts development of acute kidney injury in patients with suspected infection. Clinical Chemistry and Laboratory Medicine, 0(0), 1–7.* doi:10.1515/cclm-2012-0822
- O'Brien, J.M., Ali, N.A., Aberegg, S.K., Abraham, E., 2007. Sepsis. *Am. J. Med.* 120, 1012–1022.
- Onyenekwu, C.P., Okwundu, C.I., Ochodo, E.A., 2017. Procalcitonin, C-reactive protein, and presepsin for the diagnosis of sepsis in adults and children. *Cochrane Database Syst. Rev.* 2017.
- Ostermann, M., Joannidis, M., 2016. Acute kidney injury 2016: Diagnosis and diagnostic workup. *Crit. Care* 20, 1–13.
- Paramastuty, I., Soebandiyah, K., Purnomo, B., 2016. Urinary Kidney Injury Molecule-1 (KIM-1) in Early Diagnosis of Acute Kidney Injury in Pediatric Critically Ill. *J. Trop. life Sci.* 6, 28–34.
- Pardede, S.O., 2018. Infeksi pada Ginjal dan Saluran Kemih Anak. *Sari Pediatr.* 19, 364.
- Parikh, C.R., Moledina, D.G., Coca, S.G., Thiessen-Philbrook, H.R., Garg, A.X., 2016. Application of new acute kidney injury biomarkers in human randomized controlled trials. *Kidney Int.* 89, 1372–1379.



rrnatana, S., Manrique-Caballero, C.L., Gómez, H., Kellum, J.A., 2019. Acute kidney injury from sepsis: current concepts, epidemiology, pathophysiology, prevention and treatment. *Physiol. Behav.* 96, 1083–1099.

Plunkett, A., Tong, J., 2015. Sepsis in children. *BMJ* 350, 1–13.

Pode-Shakked, N., Ceschia, G., Rose, J.E. *et al.* Increasing angiotensin-converting enzyme concentrations and absent angiotensin-converting enzyme activity are associated with adverse kidney outcomes in pediatric septic shock. *Crit Care* **27**, 230 (2023). <https://doi.org/10.1186/s13054-023-04518-2>

Ragán D, Horváth-Szalai Z, Szirmay B, Mühl D. Novel Damage Biomarkers of Sepsis-Related Acute Kidney Injury. *EJIFCC*. 2022 Apr 11;33(1):11-22. PMID: 35645693; PMCID: PMC9092722.

Restrepo, J.M., Mondragon, M. V., Forero-Delgadillo, J.M., Lasso, R.E., Zemanate, E., Bravo, Y., Castillo, G.E., Tetay, S., Cabal, N., Calvache, J.A., 2020. Acute renal failure in children. Multicenter prospective cohort study in medium-complexity intensive care units from the Colombian southeast. *PLoS One* 15, 1–11.

Schaub, J.A., Parikh, C.R., 2016. Biomarkers of acute kidney injury and associations with short and long-term outcomes [version 1; referees: 2 approved]. *F1000Research* 5.

Schwartz, E., Hillyer, R., Foley, J., Willcutts, K., Ziegler, J., 2018. Acute Kidney Injury Masked by Malnutrition: A Case Report and the Problem of Protein. *Nutr. Clin. Pract.*

Selewski, D.T., Charlton, J.R., Jetton, J.G., Guillet, R., Mhanna, M.J., Askenazi, D.J., Kent, A.L., 2015. Neonatal acute kidney injury. *Pediatrics* 136, e463–e473.

Chawla LS, Chen S, Bellomo R, Tidmarsh GF. Angiotensin converting enzyme defects in shock: implications for future therapy. *Crit Care*. 2018 Oct 28;22(1):274. doi: 10.1186/s13054-018-2202-y. PMID: 30368243; PMCID: PMC6204272.

Singer, M., Deutschman, C.S., Seymour, C., Shankar-Hari, M., Annane, D., Bauer, M., Bellomo, R., Bernard, G.R., Chiche, J.D., Coopersmith, C.M., Hotchkiss, R.S., Levy, M.M., Marshall, J.C., Martin, G.S., Opal, S.M., Rubenfeld, G.D., Poll, T. Der, Vincent, J.L., Angus, D.C., 2016. The third international consensus definitions for sepsis and septic shock (sepsis-3). *JAMA - J. Am. Med. Assoc.* 315, 801–810.

Starr MC, Banks R, Reeder RW, Fitzgerald JC, Pollack MM, Meert KL, McQuillen PS, Mourani PM, Chima RS, Sorenson S, Varni JW, U'ingorani S, Zimmerman JJ; Life After Pediatric Sepsis Evaluation (APSE) Investigators. Severe Acute Kidney Injury Is Associated with Increased Risk of Death and New Morbidity After Pediatric Septic Shock. *Pediatr Crit Care Med*. 2020 Sep;21(9):e686-e695. doi: 10.1097/PCC.0000000000002418. PMID: 32569242; PMCID:



PMC7483282.

Tsiotou, A., Sakorafas, G., Anagnostopoulos, G., Bramis, J., 2005. Septic shock; current pathogenetic concepts from a clinical perspective. *Med Sci Monit* 11, 76–85.

Karimi F, Maleki M, Nematbakhsh M. View of the Renin-Angiotensin System in Acute Kidney Injury Induced by Renal Ischemia-Reperfusion Injury. *J Renin Angiotensin Aldosterone Syst.* 2022 Oct 22;2022:9800838. doi: 10.1155/2022/9800838. PMID: 36320442; PMCID: PMC9617735.

Weiss, S., Fitzgerald, J., Pappachan, J., Al., E., 2015. Global epidemiology of pediatric severe sepsis: the sepsis prevalence, outcomes, and therapies study. *Am J Respir Crit Care Med* 191, 1147– 57.

Uehara Y, Miura S, Yahiro E, Saku K. Non-ACE pathway-induced angiotensin II production. *Curr Pharm Des.* 2013;19(17):3054-9. doi: 10.2174/1381612811319170012. PMID: 23176219.

Pereira-Acácio A, Veloso-Santos JPM, Nossar LF, Costa-Sarmiento G, Muzi-Filho H, Vieyra A. Angiotensin-(3-4) normalizes the elevated arterial blood pressure and abnormal Na⁺/energy handling associated with chronic undernutrition by counteracting the effects mediated by type 1 angiotensin II receptors. *PLoS One.* 2022 Aug 19;17(8):e0273385. doi: 10.1371/journal.pone.0273385. PMID: 35984814; PMCID: PMC9390919.

Huskić J, Culo F, Dautović S, Mulabegović N. Angiotensin converting enzyme activity and nitric oxide level in serum patients with dehydration. *Bosn J Basic Med Sci.* 2007 Feb;7(1):33-6. doi: 10.17305/bjbmms.2007.3086. PMID: 17489765; PMCID: PMC5802283.

Wong, C.H., Wang, Y.L., Huang, J.P., 2021. Postoperative reproductive outcomes in women with ovarian pregnancy: A retrospective analysis. *Taiwan. J. Obstet. Gynecol.* 60, 295–298.

Wong, M.K.S., 2021. Angiotensin II, *Handbook of Hormones: Comparative Endocrinology for Basic and Clinical Research.* Elsevier Inc.

Wulandari, A., Martuti, S., Pudjiastuti, 2017. Perkembangan Diagnosis Sepsis pada Anak. *Sari Pediatr.* 19, 237–44.



L, Balamuth F, Thurm CW, Downes KJ, Fitzgerald JC, Laskin BL. Major Adverse Kidney Events in Pediatric Sepsis. *Clin J Am Soc nephrol.* 2019 May 7;14(5):664-672. doi: 10.2215/CJN.12201018. pub 2019 Apr 18. PMID: 31000518; PMCID: PMC6500940.

- Weiss SL, Balamuth F, Thurm CW, Downes KJ, Fitzgerald JC, Laskin BL. Major Adverse Kidney Events in Pediatric Sepsis. Clin J Am Soc Nephrol. 2019 May 7;14(5):664-672. doi: 10.2215/CJN.12201018. Epub 2019 Apr 18. PMID: 31000518; PMCID: PMC6500940.
- Wheeler DS, Wong HR, Zingarelli B. Pediatric Sepsis - Part I: "Children are not small adults!". Open Inflamm J. 2011 Oct 7;4:4-15. doi: 10.2174/1875041901104010004. PMID: 23723956; PMCID: PMC3665507.
- Xu, Z., Li, W., Han, J., Zou, C., Huang, W., Yu, W., Shan, X., Lum, H., Li, X., Liang, G., 2017. Angiotensin II induces kidney inflammatory injury and fibrosis through binding to myeloid differentiation protein-2 (MD2). Sci. Rep. 7, 1–11.
- Zarbock, A., Gomez, H., Kellum, J., 2014. Sepsis-induced AKI revisited: pathophysiology, prevention and future therapies. Curr Opin Crit Care 20, 588–595.
- Zhu, Y., Xu, D., Deng, F., Yan, Y., Li, J., Zhang, C., Chu, J., 2021. Angiotensin (1-7) Attenuates Sepsis-Induced Acute Kidney Injury by Regulating the NF- κ B Pathway. Front. Pharmacol. 12, 1–10.



Lampiran 1. Rekomendasi Persetujuan Etik

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN
KOMITE ETIK PENELITIAN UNIVERSITAS HASANUDDIN
RSPTN UNIVERSITAS HASANUDDIN
RSUP Dr. WAHIDIN SUDIROHUSODO MAKASSAR
Sekretariat : Lantai 2 Gedung Laboratorium Terpadu
JL PERINTIS KEMERDEKAAN KAMPUS TAMALANREA KM 10 MAKASSAR 90245.
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REKOMENDASI PERSETUJUAN ETIK
Nomor : 11/UN4.6.4.5.31/ PP36/ 2023

Tanggal: 3 Januari 2023

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik:

No Protokol	UH22120734	No Sponsor Protokol	
Peneliti Utama	dr. Arwini Avisia Abdullah	Sponsor	
Judul Peneliti	PERAN ANGIOTENSIN-II (ANG-II) URIN DALAM MEMPREDIKSI TERJADINYA GANGGUAN GINJAL AKUT PADA ANAK YANG MENGALAMI SEPSIS		
No Versi Protokol	2	Tanggal Versi	26 Desember 2022
No Versi PSP	2	Tanggal Versi	26 Desember 2022
Tempat Penelitian	RSUP Dr. Wahidin Sudirohusodo Makassar		
Jenis Review	☐ Exempted ☐ Expedited ☒ Fullboard Tanggal 21 Desember 2022	Masa Berlaku 3 Januari 2023 sampai 3 Januari 2024	Frekuensi review lanjutan
Ketua KEP Universitas Hasanuddin	Nama Prof.Dr.dr. Suryani As'ad, M.Sc.,Sp.GK (K)	Tanda tangan:	
Sekretaris KEP Universitas Hasanuddin	Nama dr. Agusssalim Bukhari, M.Med.,Ph.D.,Sp.GK (K)	Tanda tangan:	

Kewajiban Peneliti Utama

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 jam dan dilengkapi dalam 7 hari dan Laporan SUSAR dalam 72 jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari protokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan



Lampiran 2. Izin Penelitian



Nomor : DP.04.03/D.XIX.2/14720/2023 04 Agustus 2023
Hal : Izin Penelitian

Yth. Ketua Program Studi Ilmu Kesehatan Anak
Fakultas Kedokteran Universitas Hasanuddin

Sehubungan dengan surat saudara nomor **3882/UN4.6.8/PT.01.04/2023**, tertanggal **09 Februari 2023**, hal **Permohonan Izin Penelitian**, dapat kami fasilitasi dan memberikan izin pelaksanaan penelitian kepada:

Nama : dr. Arwini Avissa Abdullah
NIM : C105191002
Prog. Pend. : PPDS Ilmu Kesehatan Anak
No. HP : 081244882224
Judul : Peran *Angiotensin II* (Ang-II) Urin dalam Memprediksi Terjadinya Gangguan Ginjal Akut pada Anak yang Mengalami Sepsis di RSUP Dr. Wahidin Sudirohusodo Makassar
Jangka Waktu : Tiga Bulan Setelah Surat ini di Keluarkan
Lokasi : Unit Perawatan Intensif Anak (PICU)

dengan ketentuan sebagai berikut :

1. Sesuai dengan peraturan dan ketentuan penelitian yang berlaku di lingkup RSUP Dr Wahidin Sudirohusodo
2. Sebelum meneliti, peneliti wajib melapor kepada Pengawas Penelitian di masing-masing unit yang menjadi lokasi penelitian
3. Pelaksanaan penelitian tidak mengganggu proses pelayanan serta mendukung upaya peningkatan mutu pelayanan dan keselamatan pasien
4. Pemeriksaan penunjang, BHP dan lain-lain yang digunakan dalam penelitian, menjadi tanggung jawab peneliti, tidak dibebankan kepada pasien ataupun RS
5. Peneliti melaporkan proses penelitian secara periodik serta hasil penelitian di akhir waktu penelitian
6. Mencantumkan nama RSUP Dr Wahidin Sudirohusodo sebagai afiliasi institusi dalam naskah dan publikasi penelitian
7. Surat Keterangan Selesai Penelitian menjadi salah satu syarat untuk mengikuti Seminar Hasil Penelitian
8. Bukti Penyerahan Skripsi/Thesis/Disertasi ke RSUP Dr Wahidin Sudirohusodo menjadi syarat penyelesaian studi

Mohon dapat dipastikan agar ketentuan tersebut dipenuhi peneliti sebelum menyelesaikan studi di institusi saudara. Atas perhatian dan Kerjasama yang baik, diucapkan terima kasih.

a.n. Direktur Utama
Plt. Direktur Sumber Daya Manusia,
Pendidikan dan Penelitian,



Ridhayani B, SKM, M.Kes
NIP197110271997032001

Tembusan:

1. Kepala Instalasi Pelayanan Ibu dan Anak
2. Kepala Sub Instalasi Perawatan Intensif Anak (NICU dan PICU)



Dokumen ini telah ditandatangani secara elektronik yang diterbitkan oleh Balai Sertifikasi Elektronik (BSrE), BSSN

Lampiran 3. Data Penelitian

NO	No Sampel	No RM	Nama	Tgl Lahir	Usia (tahun)	UMUR	KODE UMUR	JK	KODE	BB	TB	Status Gizi	KODE GIZI	Luaran	KODE LUARAN	Ureum 1	Creatinin 1	LGF	Ureum 2	Creatinin 2	LGF	Tanpa GGA/GGA	KODE GGA	Hb	Leukosit	Trombosit	CRP	Prokal	IT	Urine output	Kode Lab	Nilai OD	Hasil (pg/mL)
1	NA 1	912628	A	2/25/2020	3 tahun 4 bulan	3	1	P	2	9	84	gizi kurang	2	Dijinkan Pulang	1	10	0.18	256.6	11	0.3	154	GGA	2	11.9	11,700	481,000	5.6	1.8		0.4	NA1	1.43655	116.3095
2	NA 2	986999	UI	5/4/2019	4 tahun 2 bulan	4	1	L	1	12	104	gizi buruk	3	Meninggal	2	101	1.17	48	133	3.03	18	GGA	2	10:02	8,000	35,000	136.7	3.37		1.2	NA2	1.64035	88.8445
3	NA 3	1011276	SA	6/27/2012	11 tahun	11	2	P	2	24	137	gizi kurang	2	Meninggal	2	24	0.3	251	172	2.07	155	GGA	2	11.6	19,900	95,000	130	200		0.9	NA3	0.225	4535.204
4	NA 4	1011747	MI	11/23/2010	12 tahun 7 bulan	13	3	L	1	29	150	gizi kurang	2	Meninggal	2	31	0.42	196	231	4.37	18	GGA	2	11.6	15,000	112,000	29	2.4	19	0.1	NA4	1.53975	99.842
5	NA 5	1011776	MZ	8/26/2021	1 tahun 10 bulan	2	1	L	1	8.4	78	gizi kurang	2	Meninggal	2	80	1.05	33	162	2.88	10	GGA	2	10.5	28,400	48,000	7.1	200		0.2	NA5	1.21665	155.6305
6	NA 6	1006916	NA	7/24/2008	14 tahun 11 bulan	15	3	P	2	32	145	gizi kurang	2	Meninggal	2	68	0.9	88	178	3.12	25	GGA	2	9.7	12,000	485,000	36.3	5.82	13	0.3	NA6	1.1205	182.3445
7	NA 7	1012875	AR	12/5/2015	7 Tahun 7 bulan	8	2	L	1	15.5	105	gizi baik	1	Dijinkan Pulang	1	26	0.2	418	19	0.45	128	Tanpa GGA	1	6.8	22,300	529,000	90.7	1.9	12	2.1	NA7	1.4543	125.915
8	NA 8	1005331	REF	2/18/2008	15 tahun 4 bulan	15	3	L	1	51	166	gizi baik	1	Meninggal	2	5	0.39	297	21	0.52	223	Tanpa GGA	1	9.1	8,300	233,000	7.3	0.05	8	3.1	NA8	1.51155	102.963
9	NA 9	975967	IM	8/15/2021	1 tahun 10 bulan	2	1	L	1	6.3	72	gizi buruk	3	Dijinkan Pulang	1	21	0.15	216	27	0.29	111	Tanpa GGA	1	12.1	4,600	220,000	1	0.005		3.7	NA9	0.55805	729.559
10	NA 10	1014632	H	9/26/2006	16 tahun 10 bulan	17	3	L	1	45	155	gizi baik	1	Dijinkan Pulang	1	20	0.29	374	21	0.43	252	GGA	2	12.1	16.2	363,000	87.7	6.6	18	1	NA10	1.1375	189.682
11	NA 11	1015133	DW	2/12/2010	13 tahun 4 bulan	13	3	L	1	26	140	gizi kurang	2	Meninggal	2	38	0.44	222	120	1.14	85	GGA	2	7	800	35,000	68.9	0.14		0.8	NA11	1.5193	101.8315
12	NA 12	912628	AN	2/25/2020	3 tahun 4 bulan	3	1	P	2	9	84	gizi kurang	2	Dijinkan Pulang	1	10	0.18	256	11	0.44	105	GGA	2	9.5	6.8	331	83.7	46.03		0.2	NA12	1.0536	205.7745
13	NA 13	1015785	MB	4/20/2016	7 tahun 2 bulan	7	2	L	1	12	110	gizi buruk	3	Dijinkan Pulang	1	29	0.17	355	27	0.42	142	GGA	2	7.5	4,700	232,000	130	0.24		2	NA13	0.97855	243.078
14	NA 14	1016455	IK	10/10/2021	1 tahun 8 bulan	2	1	P	2	10	80	gizi buruk	3	Meninggal	2	18	0.23	191	82	1.69	26	GGA	2	8.2	25,800	271,000	130	49		0.1	NA14	1.1293	179.429
15	NA 15	1020733	NI	8/29/2016	6 tahun 10 bulan	7	2	P	2	21	110	gizi baik	1	Meninggal	2	30	0.5	121	69	1.01	60	GGA	2	10.6	18,000	205,000	104	67.49	15	1.4	NA15	0.84145	323.6325
16	NA 16	1022886	MH	5/23/2012	11 tahun 11 bulan	11	2	L	1	21	128	gizi buruk	3	Dijinkan Pulang	1	27	0.33	213	19	0.61	115	Tanpa GGA	1	10.2	28,900	387,000	39.8	20.56		1.2	NA16	0.3764	1551.2135
17	NA 17	1022201	MF	6/15/2006	17 tahun	17	3	L	1	68	160	gizi baik	1	Meninggal	2	19	0.65	172	89	1.68	66	GGA	2	13.1	16.7	259	130	0.21	17	0.9	NA17	0.3246	2201.9085
18	NA 18	1023205	AG	6/14/2020	3 tahun	3	1	L	1	10.7	92	gizi buruk	3	Meninggal	2	87	0.71	71	157	2.52	20.07	GGA	2	9.2	21,600	475,000	53.7	200	20	0.2	NA18	1.1211	182.284
19	NA 19	1023955	F	9/1/2007	15 tahun 10 bulan	16	3	P	2	42	148	gizi baik	1	Meninggal	2	22	0.38	214	69	0.6	135	GGA	2	6.8	600	489,000	219.9	18.62	15	0.3	NA19	1.7328	79.3485
20	NA 20	979614	MA	8/5/2008	14 tahun 11 bulan	15	3	P	2	36	150	gizi baik	1	Meninggal	2	35	0.5	550	104	3.5	23	GGA	2	12.1	11,100	116,000	22.6	49.8		0.25	NA20	1.8751	68.192
21	NA 21	990843	AK	7/28/2022	1 tahun	1	1	L	1	9.7	51	gizi baik	1	Meninggal	2	10	0.16	143	70	0.91	25	GGA	2	5.7	22,300	288,000	4	1.9	22	1.9	NA21	1.56265	96.441
22	NA 22	1006916	NA	7/24/2008	14 tahun 11 bulan	15	3	P	2	32	145	gizi kurang	2	Meninggal	2	68	0.9	88	178	3.12	25	GGA	2	9.7	12,000	485,000	36.3	5.82	13	1.4	NA22	1.20935	157.5165
23	NA 23	1005662	G	7/4/2020	3 tahun	3	1	P	2	11	86	gizi baik	1	Meninggal	2	31	0.43	110	126	1.52	31	GGA	2	12.9	12,700	439,000	31.5	0.46	8	1	NA23	1.60955	91.1605
					16 17 tahun	17	3	L	1	68	160	gizi baik	1	Meninggal	2	19	0.65	172	89	1.68	66	GGA	2	8.2	25,800	271,000	130	49	17	0.1	NA24	1.67185	84.759
					10 3 tahun	3	1	L	1	10.7	92	gizi buruk	3	Meninggal	2	87	0.71	71	157	2.52	20	GGA	2	9.2	21,600	387,000	39.8	20.56	15	0.3	NA25	1.72815	79.9085
					7 15 tahun 10 bulan	16	3	P	2	42	148	gizi baik	1	Meninggal	2	22	0.38	214	69	0.6	135	Tanpa GGA	1	6.8	0.6	489	130	18.62	15	2.6	NA26	1.262	153.074
					2 10 bulan	1	1	L	1	4.3	63	gizi buruk	3	Meninggal	2	43	0.6	47.25	66	0.97	29	GGA	2	8.7	24,400	169,000	13.3	83.66	20	0.1	NA27	1.5687	95.681
					6 6 tahun 10 bulan	7	2	P	2	21	110	gizi baik	1	Meninggal	2	30	0.5	121	69	1.01	59.8	GGA	2	11.3	11.4	384	104	67.49	15	1.4	NA28	0.77005	377.9615
					2 11 tahun 1 bulan	11	2	L	1	22	128	gizi kurang	2	Dijinkan Pulang	1	27	0.33	174	19	0.61	94	GGA	2	10.2	28,900	387,000	39.8	20.56		0.82	NA29	0.6616	509.3435
					22 9 bulan	1	1	L	1	3.5	51	gizi buruk	3	Meninggal	2	19	0.14	163	42	1.29	17	GGA	2	9.3	26,900	351,000	46.6	1.6		0.2	NB1	0.7258	421.216



31	NB 2	938440	NAM	11/16/2020	2thn 8bln	3	1	P	2	4.5	78	gizi buruk	3	Dijinkan Pulang	1	74	0.49	87	29	0.24	178	Tanpa GGA	1	10.8	16,300	195,000	64.7	36.56	11	1.52	NB2	1.0421	209.487
32	NB 3	978090	HSD	6/27/2017	6thn	6	2	L	1	13.5	106	gizi kurang	2	Dijinkan Pulang	1	14	0.22	2.65	9	0.25	233.2	Tanpa GGA	1	13.3	9.4	317	130	0.02	9	4.2	NB3	1.2249	153.568
33	NB 4	1003612	MI	5/28/2019	4 tahun 2 bulan	4	1	L	1	9.4	94	gizi buruk	3	Dijinkan Pulang	1	11	0.08	646	11	0.05	1034	Tanpa GGA	1	5.9	1,000	117,000	55	3.49	12	4.25	NB4	0.2446	3746.123
34	NB 5	1004828	ME	8/10/2022	0 tahun 11 bulan	1	1	L	1	8.7	66	gizi kurang	2	Meninggal	2	7	0.1	297	11	0.13	228	Tanpa GGA	1	8.3	15,900	105,000	6.3	0.43		1.5	NB5	0.1235	17664.503
35	NB 6	978090	HSD	6/27/2017	5 tahun 1 bulan	6	2	L	1	16.1	106	gizi baik	1	Dijinkan Pulang	1	14	0.22	265	20	0.23	253	Tanpa GGA	1	13.5	10,100	466	23.2	0.05	10	1.2	NB6	0.113	21784.81
36	NB 7	1011823	DJL	7/31/2022	1 tahun 0 bulan	1	1	P	2	6.2	65	gizi baik	1	Meninggal	2	13	0.15	195	13	0.22	132	Tanpa GGA	1	13.5	9,100	112	130	1.26		2.4	NB7	0.1052	26252.733
37	NB 8	1009700	KA	4/10/2015	8 tahun 3 bulan	8	2	P	2	28	124	gizi baik	1	Dijinkan Pulang	1	10	0.38	179	18	0.46	148	Tanpa GGA	1	11.6	700	60	98	7.1		2.7	NB8	0.1481	11381.474
38	NB 9	918908	RA	10/5/2014	8 tahun 10 bulan	9	2	L	1	39.6	134	obesitas	1	Meninggal	2	33	0.21	350	20	0.26	283	Tanpa GGA	1	8.3	400	1	276.2	74.33	17	1	NB9	0.9789	236.199
39	NB 10	1016376	MT	5/20/2022	1 tahun 2 bulan	1	1	P	2	3.2	51	gizi buruk	3	Dijinkan Pulang	1	12	0.25	91.8	28	0.31	74	Tanpa GGA	1	13.1	5200	233	130	20.46	21	5.58	NB10	0.1397	12957.882
40	NB 11	1013992	P	3/7/2023	0 tahun 5 bulan	0.5	1	L	1	3.1	49	gizi baik	1	Dijinkan Pulang	1	18	0.22	100	8	0.37	59	Tanpa GGA	1	8.9	14,800	252	41.3	3.89	21	4	NB11	1.565	96.148
41	NB 12	1013583	RR	4/30/2021	2 tahun 3 bulan	2	1	L	1	14	89	gizi kurang	2	Dijinkan Pulang	1	13	0.25	195.8	33	0.22	222	Tanpa GGA	1	7.3	22.7	119	37.8	1.88	19	1.3	NB12	0.1732	7976.9
42	NB 13	1019508	RAG	2/21/2018	5 tahun 5 bulan	5	1	L	1	20	112	gizi baik	1	Dijinkan Pulang	1	23	0.54	114	17	0.46	133	Tanpa GGA	1	10.6	15,100	540	130	0.23	14	1.25	NB13	0.9759	237.599
43	NB 14	1019684	I	9/29/2007	15 tahun 10 bulan	16	3	L	1	40	162	gizi kurang	2	Meninggal	2	31	0.44	257	43	0.18	630	Tanpa GGA	1	11.4	12,400	454	86.2	0.87	17	3.4	NB14	0.4119	1287.516
44	NB 15	1019696	A	2/10/2013	10 tahun 5 bulan	10	2	L	1	30	136	gizi baik	1	Meninggal	2	33	0.34	122	19	0.27	154	Tanpa GGA	1	9.5	26,200	539	87.4	0.56		3.8	NB15	0.5624	694.991
45	NB 16	988484	IHA	5/21/2021	2 tahun 2 bulan	2	1	L	1	9	76	gizi baik	1	Dijinkan Pulang	1	15	0.24	174	16	0.21	199	Tanpa GGA	1	9.5	4,800	138	265	10.9	12	2.7	NB16	0.816	335.745
46	NB 17	983233	SCN	9/8/2021	1 tahun 11 bulan	2	1	P	2	6.7	76	gizi buruk	3	Meninggal	2	11	0.3	114	29	0.31	110	Tanpa GGA	1	11.9	7,900	172	23.2	1.54		2.45	NB17	0.3299	2017.841
47	NB 18	1021929	AS	5/23/2005	18 tahun 2 bulan	18	3	P	2	41	150	gizi baik	1	Meninggal	2	24	0.45	183	14	0.49	168	Tanpa GGA	1	6.9	13,600	263	77	3.4		1.84	NB18	0.1389	13178.313
48	NB 19	1017982	AT	1/5/2022	1 tahun 7 bulan	2	1	P	2	7.5	82	gizi buruk	3	Dijinkan Pulang	1	12	0.23	160	8	0.26	141	Tanpa GGA	1	12.2	14,600	833	49.9	2.72	20	2.9	NB19	0.5941	623.338
49	P3	149748	MQ	10/24/2008	14 tahun 8 bulan	15	3	L	1	36	141	gizi baik	1	Meninggal	2	256	19.93	4.9	385	23.6	4.18	GGA	2	6.7	10.5	217	4.9	0.95		0.1	P3	1.2968	137.66
50	P4	1030371	M	11/29/2022	7 bulan	1	1	L	1	8	65	gizi baik	1	Meninggal	2	11	0.11	265	11	0.26	102.8	Tanpa GGA	1	9	17.6	217	207.3	0.06	20	2.5	P4	1.1895	162.34
51	P5	1030416	ANG	4/11/2013	10 tahun 2 bulan	10	2	P	2	30	148	gizi kurang	2	Dijinkan pulang	1	9	0.37	220	26	0.41	198	Tanpa GGA	1	13.2	4.6	114	17	0.12		0.6	P5	1.2582	145.945
52	A1	1030425	R	05/04/2006	17 th 4 bln	17	3	P	2	32	154	gizi kurang	2	Dijinkan pulang	1	54	1.55	54.6	80	1.81	46.7	GGA	2	7.6	13.8	303	130	4.7	18	1.04	A1	0.46845	996.045
53	A2	1028425	NF	25/8/2005	18 th	18	3	P	2	60	160	gizi baik	1	Dijinkan pulang	1	262	17.85	4.9	438	18.52	4.7	GGA	2	8.1	8.8	193	120	11.92		0.47	A2	1.6262	89.384
54	A3	1022086	AE	20/20/2008	14 th 10 bln	15	3	L	1	40	155	gizi kurang	2	Meninggal	2	285	3.79	29	303	8.21	13	GGA	2	9.6	14.3	295	130	4.44	19	0.02	A3	1.6319	88.758
55	A4	982867	SZS	22/2/2008	15 th 6 bln	16	3	P	2	44.8	160	gizi baik	1	Dijinkan Pulang	1	56	4.47	20	164	6.5	13.5	GGA	2	7.5	6.5	120	1.3	0.33	11	0.1	A4	0.6959	457.277
					12 th 2 bulan	12	3	P	2	32	140	gizi kurang	2	Dijinkan pulang	1	21	0.43	179	36	0.46	167	Tanpa GGA	1	10.3	1,000	48	113	0.51	15	0.98	A5	0.6297	555.461
					2 th 6 bln	3	1	P	2	9	85	gizi buruk	3	Dijinkan pulang	1	22	0.22	212.5	22	0.24	195	Tanpa GGA	1	8.2	800	17	135.8	1.73	19	1.4	A6	1.44995	111.3085
					1 tahun 7 bulan	2	1	P	2	7.5	82	gizi buruk	3	Dijinkan Pulang	1	12	0.23	160	8	0.26	141	Tanpa GGA	1	12.2	14,600	833	49.9	2.72	20	2.9	NB19	0.5941	623.338

