

DAFTAR PUSTAKA

1. Kidney Disease : Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. Vol.3, Kidney Inter. 2013. 1-150.
2. Kementerian Kesehatan RI. Pusat Data dan Informasi Kementerian Kesehatan RI : Situasi Penyakit Ginjal Kronik. 2017.
3. Bikbov B, Purcell C, Levey A, Mary S, Abdoli A, Abebe M, *et al.* Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet.* 2020;395(10225):709–33.
4. Hill NR, Samuel T F, Jason L O, Jennifer A H, Christopher, O’Callaghan Lasserson DS, *et al.* Global Prevalence of Chronic Kidney Disease A systemic review and metaanalysis. *PLoS One.* 2016;1–18.
5. PERNEFRI. 11th Report Of Indonesian Renal Registry IRR. 2018;1–46.
6. Kementrian Kesehatan Republik Indonesia. Hasil Riset Kesehatan Dasar Tahun 2018. Vol. 53, Badan Penelitian dan Pengembangan Kesehatan. 2018. 1689–16.
7. Jankowski J, Jurgen F, Danilo F, Michael B, Nikolaus M. Cardiovascular Disease in Chronic Kidney Disease : Pathophysiological insight and therapeutic options. *CirculationAHA.* 2021 ; 1157-72.
8. Thompson S, James M, Wiebe N, Hemmelgarn B, Manns B, Klarenbach S, Tonelli M; Alberta Kidney Disease Network. Cause of death in patients with reduced kidney function. *J Am Soc Nephrol.* 2015;26:2504–11.

9. Webster AC, Nagler EV, Morton RL, Masson P. Chronic kidney disease. *Lancet*. 2017;389:1238–52.
10. Liu M, Lu L, Chen S, Zhang P. Cardiovascular disease and its relationship with chronic kidney disease. *European Review for Medical and Pharmacological Sciences*. 2014; 18: 2918-2926
11. Carracedo J, Alque M, Vida C, Bodega G, Morales E, Ramirez R, *et al*. Mechanism of Cardiovascular Disorders in Patients With Chronic Kidney Disease : A Process Related to Accelerated Senescence. *Front Cell Dev Biology*. 2020.
12. Chen, S. C., Huang, J. C., Su, H. M., Chiu, Y. W., Chang, J. M., Hwang, S. J., *et al*. (2018). Prognostic cardiovascular markers in chronic kidney disease. *Kidney Blood Press Res*. 43, 1388–407.
13. Matsushita, K., Coresh, J., Sang, Y., Chalmers, J., Fox, C., Guallar, E., *et al*. (2015). Estimated glomerular filtration rate and albuminuria for prediction of cardiovascular outcomes: a collaborative meta-analysis of individual participant data. *Lancet Diabetes Endocrinol*. 3, 514–25.
14. Cuenca M, Peter H, Marc V. Most exposed : the endothelium in chronic kidney disease. *Nephrol Dial Transplant*. 2020 35;1478-87.
15. Fliser D, Wiecek A, Suleymanlar G *et al*. The dysfunctional endothelium in CKD and in cardiovascular disease: mapping the origin(s) of cardiovascular problems in CKD and of kidney disease in cardiovascular conditions for a research agenda. *Kidney Int Suppl* 2011; 1: 6–9
16. Roumeliotis S, Francesca M, Carmice Z. Endothelial Dysfunction in Chronic Kidney Disease, from Biology to Clinical Outcomes: A 2020 Update. *J Clin Med*. 2020.1-14.

17. Yilmaz, M.I.M.I.; Saglam, M.; Caglar, K.; Cakir, E.; Sonmez, A.; Ozgurtas, T.; Aydin, A.; Eyileten, T.; Ozcan, O.; Acikel, C.; *et al.* The determinants of endothelial dysfunction in CKD: Oxidative stress and asymmetric dimethylarginine. *Am. J. Kidney Dis.* **2006**, 47, 42–50.
18. Vanhoutte, P.M.; Zhao, Y.; Xu, A.; Leung, S.W.S. Thirty Years of Saying NO: Sources, Fate, Actions, and Misfortunes of the Endothelium-Derived Vasodilator Mediator. *Circ. Res.* **2016**, 119, 375–96.
19. Fostermann U dan Munzel T. Endothelial nitric oxide synthase in vascular disease: from marvel to menace. *Circulation.* 2006; 117:1708-14.
20. Sena CM, Pereira M dan Seica R. Endothelial dysfunction : A major mediator of diabetic vascular disease. *Biochimica et Biophysica Acta (BBA)-Molecular Basis of Disease.* 2013;443-52.
21. Saenz M J, Mercedes M, Claudia R, Ana S, Cristina C, Joaquin C, *et al.* Endothelial Dysfunction : An Intermediate Clinical Feature between urolithiasis and Cardiovascular Diseases. *Int J Mol Sci.* 2022.
22. Alexander I, Elena O, Arno S, Michael S, Danijela T, Dirk D, *et al.* Endothelial function in cardiovascular medicine: a consensus paper of the European Society of Cardiology Working Groups on Atherosclerosis and Vascular Biology, Aorta and Peripheral Vascular Disease, Coronary Pathophysiology and Microcirculation, and Thrombosis. *European Society of Cardiology.* 2021. 117. 29-42.
23. Hlatky MA, Greenland P, Arnett DK, Ballantyne CM, Criqui MH, Elkind MSV, *et al.* American Heart Association Expert Panel on Subclinical Atherosclerotic Diseases and Emerging Risk Factors and the Stroke Council. Criteria for evaluation of novel markers of cardiovascular risk: a scientific statement from the

- American Heart Association. *Circulation* 2009;119:2408–16.
24. Vlachopoulos C, Xaplanteris P, Aboyans V, Brodmann M, Cífková R, Cosentino F, *et al.* The role of vascular biomarkers for primary and secondary prevention. A position paper from the European Society of Cardiology Working Group on peripheral circulation: endorsed by the Association for Research into Arterial Structure and Physiology (ARTERY) Society. *Atherosclerosis* 2015;241:507–32.
25. Green, D, Jones H, Thijssen D, Cable NT, Atkinson G. Flow Mediated Dilation and Cardiovascular Event Prediction : Does Nitric Oxide Matter ?. *Aha journals*. 2011; 57: 363-369.
26. Inaba Y, Chen JA, Bergmann SR. Prediction of future cardiovascular outcomes by flow-mediated vasodilatation of the brachial artery: a metaanalysis. *Int J Cardiovasc Imag*. 2010;26:631– 640.
27. Zhang H, Xiang S, Dai Z, Fan Y. Assymmetric Dimethylarginine level as biomarkers of cardiovascular or all-cause mortality in patients with chronic kidney disease: a meta analysis. *Biomarkers*. 2021. 1-7.
28. Asmarawati T, Thaha M, Aditiawardana, Nunuk M, Ardityo R, Artaria T, *et al.* Comparison of *Asymmetric dimethylarginine* Levels Between Stages Three, Four, and Five Non-dialysis of Chronic Kidney Disease. *Acta Medica Indonesiana*. 2016. 28-34.
29. Vassalotti JA, Centor R, Turner BJ, Greer RC, Choi M, Sequist TD. Practical Approach to Detection and Management of Chronic Kidney Disease for the Primary Care Clinician. *Am J Med*. 2016;129(2):153-62.
30. Vinodh Kumar B, Mohan T. Retrospective comparison of estimated GFR using 2006 MDRD, 2009 CKD-EPI and cockcroft-gault with 24 hour urine creatinine

- clearance. *J Clin Diagnostic Res.* 2017;11(5):BC09-12.
31. Darwin E, Eka F E, Dwitya E. *Endotel : Fungsi dan Disfungsi.* Andalas University Press. 2018.
32. Endemann DH dan Schiffrin EL. Endothelial Dysfunction. *JASN.* 2004; 1983-1992.
33. Rajendran P, Rengarajan T, Thangavel J, Nishigaki Y, Saktisekaran D, Sethi G *et al.* The Vascular Endothelium and Human Diseases. *Int J Biol Sci.* 2013; 1057-69.
34. Verma S, Anderson TJ. Fundamentals of Endothelial Function for the Clinical Cardiologist. *Circulation.* 2002; 546-49.
35. Michael A, Gimbrone, Garcia C. Endothelial Cell Dysfunction and the Pathobiology of Atherosclerosis. *Circ Res* *118*; 620-636. 2016.
36. Peng, W.; Cai, G.; Xia, Y.; Chen, J.; Wu, P.; Wang, Z.; Li, G.; Wei, D. Mitochondrial dysfunction in atherosclerosis. *DNA Cell Biol.* 2019, *38*, 597–606.
37. Rush, J.W.; Denniss, S.G.; Graham, D.A. Vaskular nitric oxide and oxidative stress: determinants of endothelial adaptations to cardiovascular disease and to physical activity. *Can. J. Appl. Physiol.* **2005**, *30*, 442–474.
38. Yu, S.; Zhang, L.; Liu, C.; Yang, J.; Zhang, J.; Huang, L. PACS2 is required for ox-LDL-induced endothelial cell apoptosis by regulating mitochondria-associated ER membrane formation and mitochondrial Ca²⁺ elevation. *Exp. Cell Res.* 2019, *379*, 191–202.
39. Shemiakova T, Ekaterina I, Andrey V, Grechko, Elena V, Gerasimova, *et al.* Mitochondrial Dysfunction DNA Damage in the Context of Pathogenesis of Atherosclerosis. *Biomedicines.* *8*,166. 2020.
40. Libby P, Buring JE, Badimon L, Hansson GK, Deanfield J, Bittencourt MS,

- Tokguzoglu L, and Lewis EF. Atherosclerosis. *Nat Rev Dis Primers*. 5;56. 2019.
41. Tabas I, Garcia, and Owens GK. Recent insights into the cellular biology of atherosclerosis. *J Cell Biol* 209;13-22. 2015.
42. Chiestikov DA, Melnichenko AA, Grechko AV, Myaseodova VA and Orekhov AN. Potential of anti-inflammatory agents for treatment of atherosclerosis. *Exp Mol Pathol* 104; 114-124.2018.
43. Xu Suowen, iqra I, Peter J, Hong L, Danielle K, Zheng X, *et al*. Endothelial Dysfunction in Atherosclerotic Cardiovascular Diseases and Beyond: From Mechanism to Pharmacotherapies. *Pharmacol Rev* 73; 924-967. July. 2021
44. Fliser, D.Wiecek, A. Suleymanlar, G. Ortiz, A. Massy, Z. Lindholm, B, *et al*. The dysfunctional endothelium in CKD and in cardiovascular disease: Mapping the origin(s) of cardiovascular problems in CKD and of kidney disease in cardiovascular conditions or a research agenda. *Kidney Int. Suppl*. 2011, 1, 6–9.
45. Peyster, E. Chen, J. Feldman, H.I. Go, A.S. Gupta, J. Mitra, N. *et al*. Inflammation and Arterial Stiffness in Chronic Kidney Disease: Findings From the CRIC Study. *Am. J. Hypertens*. 2017, 30, 400–408.
46. Dalan, R.; Liew, H.; Tan, W.K.A.; Chew, D.E.K.; Leow, M.K.S. Vitamin D and the endothelium: Basic, translational and clinical research updates. *IJC Metab. Endocr*. 2014, 4, 4–17.
47. Theodorakopoulou M, Maria S, Pantelis S. Assessment of Endothelial and Microvascular Function in CKD: Older and Newer Techniques, Associated Risk Factors, and Relation with Outcomes. *Am J Nephrol*. 2020. 931-49.
48. Schlesinger, S.; Sonntag, S.R.; Lieb, W.; Maas, R. Asymmetric and Symmetric Dimethylarginine as Risk Markers for Total Mortality and Cardiovascular

- Outcomes: A Systematic Review and Meta-Analysis of Prospective Studies. PLoS ONE **2016**, 11, 0165811.
49. Leiper, J.M. The DDAH-ADMA-NOS pathway. Ther. Drug. Monit. **2005**, 27, 744–46.
50. Morales, Y.; Cáceres, T.; May, K.; Hevel, J.M. Biochemistry and regulation of the protein arginine methyltransferases (PRMTs). Arch. Biochem. Biophys. **2016**, 590, 138–52.
51. Widmer RJ, Lerman A. Endothelial dysfunction and cardiovascular disease. Global Cardiology Science and Practice. 2014; 43.
52. Arrigoni. F, Ahmetaj B, Leiper J. The Biology and Therapeutic Potential of the DDAH/ADMA Pathway. Current Pharmaceutical Design. 2010. 4089-102.
53. Damaso E O, Nestor O D, Fransisco R, Juan P, Eduardo B, Fayna G, *et al.* Asymmetric (ADMA) and Symetric (SDAM) Dimethylarginine in Chronic Kidney Disease : A Clinical Approach. Int. J. Mol. Sci. 2019.1-9.
54. Dowsett L, Erin H, Sarah A, Noha A, Fiona C, James L. ADMA : A Key Player in the Relationship between Vascular Dysfunction and Inflammation in Atherosclerosis. J.Clin. Med. 2020. 1-12.
55. Jarzebska, N.; Mangoni, A.A.; Martens-Lobenho_er, J.; Bode-Böger, S.M.; Rodionov, R.N. The second life of methylarginines as cardiovascular targets. Int. J. Mol. Sci. **2019**, 20, 4592.
56. Achan, V.; Broadhead, M.; Malaki, M.; Whitley, G.; Leiper, J.; MacAllister. *Asymmetric dimethylarginine* causes hypertension and cardiac dysfunction in humans and is actively metabolized by dimethylarginine dimethylaminohydrolase. Arterioscler. Thromb. Vasc. Biol. **2003**, 23, 1455–59.

57. Sibal L, Sharad C, Philip H, Rainer B. The Role of *Asymmetric dimethylarginine* (ADMA) in Endothelial Dysfunction and Cardiovascular Disease. *Current Cardiology Review* 2010; 6 ; 82-90.
58. Sampaio A, Joao D, Renata A, Luri D, Helena N. Methods of Endothelial Function Assessment : Description and Applications. *International Journal of Cardiovascular Science*. 2017; 30(3): 262-73.
59. Tousoulis D, Antoniades C, Stefanadis C. Evaluating Endothelial Function in Humans: A Guide to Invasif and Non-invasif Techniques. *Heart*. 2015; 91:553-58.
60. Dick H, Mark A, Kyra E, Jaume P, Greg A, Ryan A, *et al*. Assessment of Flow Mediated dilation in humans: a methodological and physiological guideline. *Am J Physiol Heart Circ Physiol*. 2010.H1-9.
61. Hussein M, Salwa S, Ghada A, Mohammed Z. Brachial artery flow mediated dilation and carotid intima media thickness for assessment of subclinical atherosclerosis in rheumatoid arthritis. *The Egyptian Journal of Internal Medicine*. 2017. 29: 132-40.
62. Hsu Chien, Tain You. Impact of Arginine Nutrition and Metabolism during Pregnancy on Offspring Outcomes. *MDPI journal. Nutrients*. 2019. 11. 1452.
63. Moncada S dan Higgs EA. The discovery of nitric oxide and its role in vascularbiology. *Br J Pharmacol*,2006; 193-201.
64. Xue. Effect of endothelial nitric oxide synthase gene on end stage renal disease progression in autosomal dominant polycystic kidney disease. *Asian Pasific Society of Nephrology* 19. 2014; 630-37.
65. Zhou TB, Yin SS. Association of endothelial nitric oxide synthase Glu298Asp Gene Polymorphism with the risk of end stage renal disease. *Informa Healthcare*.

- 2013; 573-78.
66. Kashiwagi S, Atochin Q, Li M, Schleicher, Pong W.C , Sessa, Huang. eNOS phosphorylation on serine 1176 affect insulin sensitivity and adiposity. *Biochem. Biophys. Res. Commun*, 2013; 284-90.
67. Ariani G. Korelasi antara endhotelin-1 serum dengan rasio albumin kreatinin urin pada pasien penyakit ginjal kronik (Tesis). Fakultas Kedokteran Universitas Andalas. 2021.
68. Mihai S, Codrici E, Popescu ID, Enciu AM, Rusu E, Zilisteanu D, *et al.* Inflammation-related patterns in the clinical staging and severity assessment of chronic kidney disease. *Dis Markers*. 2019;2019–25.
69. Xu G, Luo K, Liu H, Huang T, Fang X, Tu W. The progress of inflammation and oxidative stress in patients with chronic kidney disease. *Renal Failure*. 2015;37(1):45–9
70. Chang HR, Yang SF, Li ML, Lin CC, Hsieh YS, Lian J Da. Relationships between circulating matrix metalloproteinase-2 and -9 and renal function in patients with chronic kidney disease. *Clin Chim Acta*. 2006;366(1–2):243–8.
71. Harris R, Zhang MZ. The Role of Gende Disparities in Kidney Injury. *Ann Transl Med*. 2020; 8(7): 514.
72. Ricardo AC, Yang W, Sha D, *et al.* Sex-Related Disparities in CKD Progression. *J Am Soc Nephrol* 2019;30:137-46.
73. Zhang MZ, Sasaki K, Li Y, *et al.* The role of the epidermal growth factor receptor in gender disparities in kidney injury. *J Am Soc Nephrol* 2019;30:1659-73.
74. Feng JY, Liu KT, Abraham E, *et al.* Serum estradiol levels predict survival and acute kidney injury in patients with septic shock--a prospective study. *PLoS One*

2014;9:e97967.

75. Dubey AK, Sahoo J, Vairappan B, Haridasan S, Parameswaran S, Priyamvada PS. Correction of metabolic acidosis improves muscle mass and renal function in chronic kidney disease stages 3 and 4: a randomized controlled trial. *Nephrol Dial Transplant*. 2020;35(1):121–9.
76. Xu G, Luo K, Liu H, Huang T, Fang X, Tu W. The progress of inflammation and oxidative stress in patients with chronic kidney disease. *Renal Failure*. 2015;37(1):45–9.
77. Hustrini NM, Susalit E, Rotmans J. Prevalence and risk factors for chronic kidney disease in Indonesia: An analysis of the National Basic health Survey 2018. *J Glob Health*. 2022; 12:04074.
78. Krzanowski M, Krzanowska K, Gajda M, Dumnicka P, Dziewier A, Woziwodka K, *et al*. Pentraxin 3 as a new indicator of cardiovascular-related death in patients with advanced chronic kidney disease. *Pol arch med wewn*. 2017;1403–38.
79. Ravani P, Quinn R, Fiocco M, Liu P, Huda W, Lam, *et al*. Association of Age with risk of kidney failure in Adults with stage IV chronic kidney disease in Canada. *JAMA Netw Open*. 2020; 3(9);e2017150.
80. Armstrong C. JNC 8 guidelines for the management of hypertension in adults. *Am Fam Physician*. 2014;90(7):503–4.
81. Rodríguez-Sánchez E, Navarro-García JA, Aceves-Ripoll J, Álvarez-Llamas G, Segura J, Barderas MG, *et al*. Association between renal dysfunction and metalloproteinase MMP-9 activity in hypertensive patients. *Nefrologia*. 2019;39(2):184–91.

82. Liu P, Quinn RR, Lam NN, Al-Wahsh H, Sood MM, Tangri N, *et al.* Progression and regression of chronic kidney disease by age among adults in a population- based cohort in Alberta, Canada. *JAMA Netw Open.* 2021;4(6):1–13.
83. Boon TB, Chan GC, Leo C, Tay J, Chiea Y, Diddique S, *et al.* Hypertension and chronic kidney disease in Asian Populations. *The Journal of clinical hypertension.* 2021;p.475-480.
84. Horowitz B, Miskulin D, Zager B. Epidemiology of Hypertension in CKD. *Advances in Chronic Kidney Disease.* Volume 22, 2015;p 88-95.
85. Gupta R, Woo K, Yi J. Epidemiology of End Stage Kidney disease. *Semin Vasc Surg.* 2021;34(1);71-78.
86. Qian J, Zhong J, Liu S, Yan M, Gu Y, Lai L. Klotho, Plasma Asymmetric Dimethylarginine, and Kidney Disease Progression. *Kidney Med.* 2021;3(6):984-991.e1.
87. X. Liu, X. Xu, R. Shang, Y. Chen, Asymmetric dimethylarginine (ADMA) as an important risk factor for the increased cardiovascular diseases and heart failure in chronic kidney disease, *Nitric Oxide.*2018.
88. Maruhashi T, Kajikawa M, Kishimoto S, Hashimoto H, Takaeko Y, Yamaji T, *et al.* Diagnostic Criteria of Flow mediated Vasodilation for Normal Endothelial Function and Nitroglycerin-induced Vasodilation for Normal Vascular Smooth Muscle Function of the Brachial Artery. *Journal of the American Heart Association.* 2020;9:e013915.
89. Heiss C, Rodriguez A, Bapir M, Skene S, Sies H, Kelm M. Flow mediated dilation reference values for evaluation of endothelial function and cardiovascular health. *Cardiovasc Res.*2023 Mar 17;119(1):283-293.

90. Flammer, A.J.; Anderson, T.; Celermajer, D.S.; Creager, M.a.; Deanfield, J.; Ganz, P.; Hamburg, N.M.; Lüscher, T.F.; Shechter, M.; Taddei, S.; *et al.* The assessment of endothelial function: From research into clinical practice. *Circulation* **2012**, *126*, 753–767.
91. Ito H, Nakashima M, Meguro K, Furukawa H, Takaki A, Yukawa C, *et al.* Flow mediated dilation is reduced with the Progressive Stages of Glomerular Filtration Rate and Albuminuria in Type 2 Diabetic Patients without Coronary Heart Disease. *J Diabetes Res.* 2015;728127.
92. Ramezanzadeh E, Fallah S, Vakilpour A, Abedi M, Hassanipour S. Endothelial function assessment by flow mediated dilation of the brachial artery in acute kidney injury and chronic kidney disease
93. Sharma J, Kapoor A, Muthu R. Assessment of endothelial dysfunction in Asian Indian Patients with chronic kidney disease and Changes following renal transplantation. *Clin Transplant.* 2014;28:889-96.
94. Li Y, Cu R, Liu K, Cui M, Dong J, Imano H, *et al.* relationship between Endothelial dysfunction and Prevalence of Chronic Kidney Disease : The Circulatory Risk in Communities Study (CIRCS). *J Atheroscler Thromb.* 2021;28;622-629.
95. Gamill S, Erdmann J, Schwedhelm E, Hussein K, Abdalrahman I, Mohamed A. Increased Serum Levels of Asymmetric Dimethylarginine and Symmetric Dimethylarginine and Decreased Levels of Arginine in Sudanese Patients with Essential Hypertension. *Kidney Blood Press Res* (2020)45(5):727-736.
96. Frases S, Roderick P, May C, Natasha M, McIntrye C, Fluck R, Shardlow A, *et al.* The Burden of comorbidity in people with chronic disease stage 3: a cohort study.

BMC Nephrol. 2015;16:193.

97. Anraku K, Tokkoi S, Toyoda S, Sakuma M, Arikawa T, Waku R, *et al.* Impact of Vascular endothelial function on comorbid chronic kidney disease in patients with non-ischemic heart failure. *Vasc Fail* 2020;4:32-38.

98. Mucka S, Miodoriska M, Jakubiak G, Starzak M, Cieslar G, Stanek A. Endothelial Function Assessment by Flow Mediated Dilation Method : a Valuable Tool in the Evaluation of the Cardiovascular System. *Int J Environ Res Public Health*.2022;19(18)11242.

99. Ono T, Miyoshi T, Ohno Y, Osawa K, Nakaya Y, Miki T, *et al.* Brachial Intima media thickness is associated with coronary artery atherosclerosis in patients with diabetes mellitus. *Heart vessel*. 2019; 34:1405-411.

