

DAFTAR PUSTAKA

1. Kline KA, Bowdish DME. Infection in an aging population. *Curr Opin Microbiol* [Internet]. 2016;29:63–7.
2. Organization WH. Ageing and Health. 2022.
3. Regunath H, Oba Y. Community-Acquired Pneumonia Pathophysiology Treatment / Management. 2019;1–4.
4. Marik PE, Kaplan D. reviews Aspiration Pneumonia and Dysphagia in the Elderly. *Chest* [Internet]. 2003;124(1):328–36.
5. Faniyi AA, Hughes MJ, Scott A, Belchamber KBR, Sapey E. Inflammation, ageing and diseases of the lung: Potential therapeutic strategies from shared biological pathways. *Br J Pharmacol*. 2022;179(9):1790–807.
6. Simonetti AF, Viasus D, Garcia Vidal C, Carratal J. Management of community-acquired pneumonia in older adults. *Ther Adv Infect Dis*. 2014;2(1):3–16.
7. Kolditz M, Ewig S. Community-Acquired Pneumonia in Adults. 2017;
8. Kuikel S, Pathak N, Poudel S, Thapa S, Bhattarai SL, Chaudhary G, et al. Neutrophil–lymphocyte ratio as a predictor of adverse outcome in patients with community-acquired pneumonia: A systematic review. *Heal Sci Reports*. 2022;5(3):1–10.
9. Yang T, Wan C, Wang H, Qin J, Chen L, Shen Y, et al. The prognostic and risk-stratified value of neutrophil-lymphocyte count ratio in Chinese patients with community-acquired pneumonia. *Eur J Inflamm*. 2017;15(1):22–7.
10. Anurag A, Preetam M. Validation of PSI/PORT, CURB-65 and SCAP scoring system in COVID-19 pneumonia for prediction of disease severity and 14-day mortality. *Clin Respir J*. 2021;15(5):467–71.
11. Mizgerd JP. Inflammation and Pneumonia: Why Are Some More Susceptible than Others? *Clin Chest Med*. 2018;39(4):669–76.
12. Irawan R, Reviono, Harsini. *Respirologi Indonesia*. *J Indones Soc Respirol* [Internet]. 2019;Vol. 39(1):44–53.
13. Yanagi S, Tsubouchi H, Miura A, Matsuo A, Matsumoto N, Nakazato M. The impacts of cellular senescence in elderly pneumonia and in age-related lung diseases that increase the risk of respiratory infections. *Int J Mol Sci*. 2017;18(3).
14. Castanheira FVS, Kubes P. Neutrophils and NETs in modulating acute and chronic inflammation. *Blood*. 2019;133(20):2178–85.
15. Boyd AR, Orihuela CJ. Dysregulated inflammation as a risk factor for pneumonia in the elderly. *Aging Dis*. 2011;2(6):487–500.
16. Jain V, Bhardwaj A. Pneumonia, Pathology. *StatPearls* [Internet]. 2018;1–11.
17. Quinton LJ, Walkey AJ, Mizgerd JP. Integrative physiology of pneumonia. *Physiol Rev*. 2018;98(3):1417–64.
18. Simmons SR, Bhalla M, Herring SE, Tchalla EYI, Ghanem ENB. Older but t wiser: The age-driven changes in neutrophil responses during lmonary infections. *Infect Immun*. 2021;89(4):1–18.
i R, Chan AKY, Wu J, Lee TMC. Relationships between Inflammation and e-Related Neurocognitive Changes. *Int J Mol Sci*. 2022;23(20).
: Steenhuijsen Piters WAA, Huijskens EGW, Wyllie AL, Biesbroek G, Van



- Den Bergh MR, Veenhoven RH, et al. Dysbiosis of upper respiratory tract microbiota in elderly pneumonia patients. *ISME J.* 2016;10(1):97–108.
21. Nowakowski ACH. Chronic inflammation and quality of life in older adults: A cross-sectional study using biomarkers to predict emotional and relational outcomes. *Health Qual Life Outcomes.* 2014;12(1):1–12.
 22. Smith RP, Lipworth BJ, Cree IA, Spiers EM, Winter JH. C-reactive protein: A clinical marker in community-acquired pneumonia. *Chest [Internet].* 1995;108(5):1288–91.
 23. Abbas, A. K; Lichtman, A. H; Pillai S. *Basic Immunology: Functions and Disorders of the Immune System, Sixth Edition.* Vol. 110, Elsevier. 2020. 339 p.
 24. Prendki V, Malézieux-Picard A, Azurmendi L, Sanchez JC, Vuilleumier N, Carballo S, et al. Accuracy of C-reactive protein, procalcitonin, serum amyloid A and neopterin for low-dose CT-scan confirmed pneumonia in elderly patients: A prospective cohort study. *PLoS One.* 2020;15(9 September):1–14.
 25. Nouvenne A, Ticinesi A, Folesani G, Cerundolo N, Prati B, Morelli I, et al. The association of serum procalcitonin and high-sensitivity C-reactive protein with pneumonia in elderly multimorbid patients with respiratory symptoms: Retrospective cohort study. *BMC Geriatr [Internet].* 2016;16(1):1–8.
 26. Park HN, Kim SY, Lee NM, Yi DY, Yun SW, Chae SA, et al. Usefulness of Procalcitonin in the Diagnosis of Bacterial Infection in Immunocompetent Children. *Children.* 2022;9(8):1–8.
 27. Suryavanshi, Bhimrao P. NEUTROPHIL LYMPHOCYTE RATIO (NLR) AS A PROGNOSTIC MARKER IN ADULTS WITH COMMUNITY ACQUIRED PNEUMONIA (CAP). *Eur J Mol Clin Med.* 2023;10(01):1802–8.
 28. Cataudella E, Giraffa CM, Di Marca S, Pulvirenti A, Alaimo S, Pisano M, et al. Neutrophil-To-Lymphocyte Ratio: An Emerging Marker Predicting Prognosis in Elderly Adults with Community-Acquired Pneumonia. *J Am Geriatr Soc.* 2017;65(8):1796–801.
 29. Burhan E, Isbaniah F, Hatim F, Djaharuddin I, Soedarsono, Harsini, et al. *Pneumonia Komunitas.* Edisi Revi. Jakarta: Perhimpunan Dokter Paru Indonesia;
 30. Practice EM. *Community-Acquired Pneumonia in the Emergency Department (Infectious Disease CME).* EB Medicine. 2023.
 31. Pakpahan FS, Bihar S, Syarani F, Eyoer PC. Accuracy Between CURB-65 Score and PSI in Determining The Prognosis of Community-Acquired Pneumonia Patients at H. Adam Malik General Hospital, Medan. *Respir Sci.* 2021;1(3):174–81.
 32. Shah NN, Syed Q k., Shah BA, Ahmed W, Dhobi GN, Haq I. Validity of Pneumonia Severity Index and Curb-65 Severity Scoring Systems in Community-Acquired Pneumonia in a Third World Country. *Chest.* 2009;136(4):5S.
 33. William Nseir, Amir Amara, Tamer Said-Ahmad, Julnar Mograbi, Raymond rah. Correlation between Serum C-Reactive Protein Levels and CURB-65 in Elderly Patients With Community-Acquired Pneumonia. *J Pharmarmacol.* 2020;8(11):345–51.
- H, JG O, S S, KP H, S A, CS R. *Hazzard's geriatric medicine and gerontology.* In: 7th Editio. McGraw-Hill Education; 2017.



35. Mulyana R. Terapi Antibiotika pada Pneumonia Lanjut usia. *J Kesehatan Andalas*. 2019;8(1):172.
36. González-Castillo J, Martín-Sánchez FJ, Llinares P, Menéndez R, Mujal A, Navas E, et al. Guidelines for the management of community-acquired pneumonia in the elderly patient. *Rev Esp Quimioter [Internet]*. 2014;27(1):69–86.
37. Woodhead M, Blasi F, Ewig S, Garau J, Huchon G, Ieven M, et al. Guidelines for the management of adult lower respiratory tract infections - Summary. 2011;1–24.
38. Mandell LA, Wunderink RG, Anzueto A, Bartlett JG, Campbell GD, Dean NC, et al. Infectious Diseases Society of America / American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults. 2007;44(Suppl 2).
39. Metlay JP, Waterer GW, Long AC, Anzueto A, Brozek J, Crothers K, et al. AMERICAN THORACIC SOCIETY Diagnosis and Treatment of Adults with Community-acquired Pneumonia An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. 2019;200.
40. Universitas Udayana. Workshop on Penumoniam, Deal The Challenge-Improve The Outcome. Univ Udayana. 2006;
41. Kaysin A, Viera AJ. Community-acquired pneumonia in adults: Diagnosis and management. *Am Fam Physician*. 2016;94(9):698–706.
42. Troeger C, Forouzanfar M, Rao PC, Khalil I, Brown A, Swartz S, et al. Estimates of the global, regional, and national morbidity, mortality, and aetiologies of lower respiratory tract infections in 195 countries: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet Infect Dis*. 2017 Nov 1;17(11):1133–61.
43. Osman M, Manosuthi W, Kaewkungwal J, Silachamroon U, Mansanguan C, Kamolratanakul S, et al. Etiology, Clinical Course, and Outcomes of Pneumonia in the Elderly: A Retrospective and Prospective Cohort Study in Thailand. *Am J Trop Med Hyg [Internet]*. 2021 Jun [cited 2023 Oct 19];104(6):2009–16. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8176510/>
44. Chebib N, Cuvelier C, Malézieux-Picard A, Parent T, Roux X, Fassier T, et al. Pneumonia prevention in the elderly patients: the other sides. *Aging Clin Exp Res*. 2021 Apr 1;33(4):1091–100.
45. Brown JS. Community-acquired pneumonia. *Clin Med [Internet]*. 2012 Dec [cited 2023 Oct 19];12(6):538–43. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5922594/>
46. Barbagelata E, Cillóniz C, Dominedò C, Torres A, Nicolini A, Solidoro P. Consider differences in community-acquired pneumonia. *Minerva Med*. 2020 111(2):153–65.
- igawa T, Araki S, Nakata A, Kitamura F, Yasumoto M, Sakurai S, et al. Disease in memory (CD4+CD29+ and CD4+CD45RO+) T and naive



(CD4+CD45RA+) T-cell subpopulations in smokers. *Arch Environ Health*. 1998;53(6):378–83.

48. Li W, Ding C, Yin S. Severe pneumonia in the elderly: a multivariate analysis of risk factors. *Int J Clin Exp Med* [Internet]. 2015 Aug 15 [cited 2023 Oct 19];8(8):12463–75. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4612842/>
49. Arnold FW, Reyes Vega AM, Salunkhe V, Furmanek S, Furman C, Morton L, et al. Older Adults Hospitalized for Pneumonia in the United States: Incidence, Epidemiology, and Outcomes. *J Am Geriatr Soc*. 2020 May;68(5):1007–14.
50. Menéndez R, Ferrando D, Vallés JM, Martínez E, Perpiñá M. Initial risk class and length of hospital stay in community-acquired pneumonia. *Eur Respir J* [Internet]. 2001 Jul 1 [cited 2023 Oct 19];18(1):151–6. Available from: <https://erj.ersjournals.com/content/18/1/151>
51. Masotti L, Ceccarelli E, Cappelli R, Barabesi L, Guerrini M, Forconi S. Length of hospitalization in elderly patients with community-acquired pneumonia. *Aging Clin Exp Res*. 2000 Feb 1;12(1):35–41.
52. Han DW, Jung W, Lee KN, Han K, Lee SW, Shin DW. Smoking behavior change and the risk of pneumonia hospitalization among smokers with diabetes mellitus. *Sci Rep*. 2023 Aug 30;13(1):14189.
53. Kakehi E, Uehira R, Ohara N, Akamatsu Y, Osaka T, Sakurai S, et al. Utility of the New Early Warning Score (NEWS) in combination with the neutrophil–lymphocyte ratio for the prediction of prognosis in older patients with pneumonia. *Fam Med Community Health*. 2023 Jun 21;11(2):e002239.
54. Feng DY, Zou XL, Zhou YQ, Wu WB, Yang HL, Zhang TT. Combined Neutrophil-to-Lymphocyte Ratio and CURB-65 Score as an Accurate Predictor of Mortality for Community-Acquired Pneumonia in the Elderly. *Int J Gen Med*. 2021 Mar 30;14:1133–9.
55. Amir T, Toujani S, Khaled SB, Slim A, Hedhli A, Cheikhrouhou S, et al. The Neutrophil-lymphocyte ratio in patients with community-acquired pneumonia. *European Respiratory Journal* [Internet]. 2018 Sep 15 [cited 2024 Jan 8];52(suppl 62).
56. Li J, Chen Q, Luo X, Hong J, Pan K, Lin X, et al. Neutrophil-to-Lymphocyte Ratio Positively Correlates to Age in Healthy Population. *J Clin Lab Anal*. 2014 Oct 2;29(6):437–43.
57. Qi X, Dong Y, Lin X, Xin W. Value of Neutrophil to Lymphocyte Ratio, Platelet lymphocyte Ratio, and Red Blood Cell Distribution Width in Evaluating the prognosis of Children with Severe Pneumonia. *Evid-Based Complementrn Med ECAM* [Internet]. 2021 Sep 24 [cited 2023 Oct 19];2021:1818469. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8486541/>



58. Lagerström F, Engfeldt P, Holmberg H. C-reactive protein in diagnosis of community-acquired pneumonia in adult patients in primary care. *Scand J Infect Dis* [Internet]. 2006 Jan 1 [cited 2023 Oct 19];38(11–12):964–9. Available from: <https://doi.org/10.1080/00365540500388826>
59. Daga MK, Arora N, Prakash SK, Jhamb R, Kumar N, Gupta N. C-REACTIVE PROTEIN IN LOWER RESPIRATORY TRACT INFECTIONS. *Lung India*. 2005 Jun;22(2):41.
60. Wyczalkowska-Tomasik A, Czarkowska-Paczek B, Zielenkiewicz M, Paczek L. Inflammatory Markers Change with Age, but do not Fall Beyond Reported Normal Ranges. *Arch Immunol Ther Exp (Warsz)*. 2016;64:249–54.
61. Vázquez EG, Martínez JA, Mensa J, Sánchez F, Marcos MA, Roux A de, et al. C-reactive protein levels in community-acquired pneumonia. *Eur Respir J* [Internet]. 2003 Apr 1 [cited 2023 Oct 19];21(4):702–5. Available from: <https://erj.ersjournals.com/content/21/4/702>
62. Ticinesi A, Lauretani F, Nouvenne A, Porro E, Fanelli G, Maggio M, et al. C-reactive protein (CRP) measurement in geriatric patients hospitalized for acute infection. *Eur J Intern Med*. 2017 Jan;37:7–12.
63. Self WH, Balk RA, Grijalva CG, Williams DJ, Zhu Y, Anderson EJ, et al. Procalcitonin as a Marker of Etiology in Adults Hospitalized With Community-Acquired Pneumonia. *Clin Infect Dis*. 2017 Jul 15;65(2):183–90.
64. Kim JH, Seo JW, Mok JH, Kim MH, Cho WH, Lee K, et al. Usefulness of plasma procalcitonin to predict severity in elderly patients with community-acquired pneumonia. *Tuberc Respir Dis*. 2013 May;74(5):207–14.
65. Manullang D, Keliat EN, Abidin A. Procalcitonin Level is Correlated with Community Pneumonia Severity. *Cermin Dunia Kedokt* [Internet]. 2018 Sep 3 [cited 2023 Oct 19];45(9):647–51. Available from: <https://cdkjournal.com/index.php/cdk/article/view/718>
66. Corica B, Tartaglia F, D'Amico T, Romiti GF, Cangemi R. Sex and gender differences in community-acquired pneumonia. *Intern Emerg Med* [Internet]. 2022 [cited 2023 Oct 19];17(6):1575–88. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9294783/>
67. Gutiérrez F, Masia MDM, Mirete C, Soldán B, Rodríguez J, Padilla S, et al. The influence of age and gender on the population-based incidence of community-acquired pneumonia caused by different microbial pathogens. *J Infect*. 2006 Oct 1;53:166–74.
68. Afifah Nurul. Analysis of Neutrophil/Lymphocyte Ratio and Culture Results on Clinical Severity of Patients with CAP. *Indones J Clin Pathol Med Lab* [Internet]. 2023 May 5 [cited 2023 Oct 19]; Available from: [s://www.indonesianjournalofclinicalpathology.org/index.php/patologi/article/view/1987](https://www.indonesianjournalofclinicalpathology.org/index.php/patologi/article/view/1987)



69. Kuikel S, Pathak N, Poudel S, Thapa S, Bhattarai SL, Chaudhary G, et al. Neutrophil–lymphocyte ratio as a predictor of adverse outcome in patients with community-acquired pneumonia: A systematic review. *Health Sci Rep* [Internet]. 2022 May 2 [cited 2023 Oct 19];5(3):e630. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9060320/>
70. Morris AC. Management of pneumonia in intensive care. *J Emerg Crit Care Med* [Internet]. 2018 Dec 3 [cited 2023 Oct 19];2(0). Available from: <https://jeccm.amegroups.org/article/view/4830>
71. Yang T, Wan C, Wang H, Qin J, Chen L, Shen Y, et al. The prognostic and risk-stratified value of neutrophil–lymphocyte count ratio in Chinese patients with community-acquired pneumonia. *Eur J Inflamm* [Internet]. 2017 Apr 1 [cited 2023 Oct 19];15(1):22–7. Available from: <https://doi.org/10.1177/1721727X17702150>
72. Ruopp MD, Perkins NJ, Whitcomb BW, Schisterman EF. Youden Index and optimal cut-point estimated from observations affected by a lower limit of detection. *Biom J Biom Z*. 2008 Jun;50(3):419–30.
73. Alzoubi O, Khanfar A. Association between neutrophil to lymphocyte ratio and mortality among community acquired pneumonia patients: a meta-analysis. *Monaldi Arch Chest Dis* [Internet]. 2022 [cited 2023 Dec 1];92(3). Available from: <https://www.monaldi-archives.org/index.php/macd/article/view/2050>
74. Cataudella E, Giraffa CM, Di Marca S, Pulvirenti A, Alaimo S, Pisano M, et al. Neutrophil-To-Lymphocyte Ratio: An Emerging Marker Predicting Prognosis in Elderly Adults with Community-Acquired Pneumonia. *J Am Geriatr Soc*. 2017 Aug;65(8):1796–801.
75. Le Bel J, Hausfater P, Chenevier-Gobeaux C, Blanc FX, Benjoar M, Ficko C, et al. Diagnostic accuracy of C-reactive protein and procalcitonin in suspected community-acquired pneumonia adults visiting emergency department and having a systematic thoracic CT scan. *Crit Care* [Internet]. 2015 [cited 2023 Oct 19];19:366. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4608327/>
76. Prasetya IB, Cucunawangsih, Lorens JO, Sungono V, El-Khobar KE, Wijaya RS. Prognostic value of inflammatory markers in patients with COVID-19 in Indonesia. *Clin Epidemiol Glob Health* [Internet]. 2021 Jul 1 [cited 2023 Oct 19];11:100803. Available from: <https://www.sciencedirect.com/science/article/pii/S2213398421001111>
77. Travlos A, Bakakos A, Vlachos KF, Rovina N, Koulouris N, Bakakos P. C-Reactive Protein as a Predictor of Survival and Length of Hospital Stay in Community-Acquired Pneumonia. *J Pers Med*. 2022 Oct 13;12(10):1710.



ifli K. Correlation Value Of Procalcitonin With Mortality Rate In Patients with Ventilator Associated Pneumonia Treated In The Intensive Care Unit Of Moh Hoesin Hospital Palembang Abstract. *Anesth Crit Care*. 2017;35.

79. Malézieux-Picard A, Nascè A, Azurmendi L, Pagano S, Vuilleumier N, Sanchez JC, et al. Kinetics of inflammatory biomarkers to predict one-year mortality in older patients hospitalized for pneumonia: a multivariable analysis. *Int J Infect Dis IJID Off Publ Int Soc Infect Dis*. 2022 Sep;122:63–9.

