

## DAFTAR PUSTAKA

1. Network GA. The Global Asthma Report 2018 [Internet]. Auckland, New Zealand; 2018. Available from: <http://globalasthmareport.org/burden/burden.php>
2. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention [Internet]. 2020. Available from: [www.ginasthma.org](http://www.ginasthma.org)
3. Longo, Fauci, Kasper, Hauser, Jameson, Loscalzo. Harrison's Principles of Internal Medicine [Internet]. 18th ed. Longo DL, Kasper DL, Jameson JL, editors. 5716 p. Available from: <https://eur-lex.europa.eu/legal-content/PT/TXT/PDF/?uri=CELEX:32016R0679&from=PT%0Ahttp://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52012PC0011:pt:NOT>
4. World Health Organization. Asthma [Internet]. 2020 [cited 2021 Jan 20]. Available from: <https://www.who.int/news-room/fact-sheets/detail/asthma>
5. Enilari O, Sinha S. The global impact of asthma in adult populatio. Ann Glob Heal. 2019;85(1):1–7.
6. Asher MI, García-Marcos L, Pearce NE, Strachan DP. Trends in worldwide asthma prevalence. Eur Respir J. 2020;56(6):2002094.
7. Kementrian Kesehatan Republik Indonesia. Hasil Utama Riset Kesehatan Dasar (RISKESDAS). J Phys A Math Theor. 2018;1–200.
8. Oland AA, Booster GD, Bender BG. Psychological and lifestyle risk factors for asthma exacerbations and morbidity in children. World Allergy Organ J. 2017;10(1):1–7.
9. Kementrian Kesehatan RI. Pusdatin. Pneumonia Pada Balita. 2015;
10. Walters EH, Walters JAE, Gibson PG, Jones P. Inhaled short acting beta<sub>2</sub>-agonist use in chronic asthma: regular versus as needed treatment. Cochrane Database Syst Rev. 2003;2010(1).
11. Permata sari D, et al. Pola Penggunaan Obat Asma Pada Pasien Anak Rawat Jalan Ditinjau Dari Berbagai Literatur. Pros Senantias 2020. 2020;1(1):607–14.

12. Baron AJ, Flokstra de Blok BMJ, Kerstjens HAM, Koopmans-Klein G, Price DB, Sellink AA, et al. High use of sabas is associated with higher exacerbation rate in dutch patients with asthma. *J Asthma Allergy*. 2021;14(July):851–61.
13. Prihartanto D. Pilihan Pengobatan pada Serangan Asma. RS Sar Husada, Purworejo, Indones. 2016;43(7):541–3.
14. Bloom CI, Cabrera C, Arnetorp S, Coulton K, Nan C, van der Valk RJP, et al. Asthma-Related Health Outcomes Associated with Short-Acting  $\beta$ 2-Agonist Inhaler Use: An Observational UK Study as Part of the SABINA Global Program. *Adv Ther* [Internet]. 2020;37(10):4190–208. Available from: <https://doi.org/10.1007/s12325-020-01444-5>
15. Silver HS, Blanchette CM, Kamble S, Petersen H, Letter M, Meddis D, et al. Quarterly assessment of short-acting  $\beta$ 2-adrenergic agonist use as a predictor of subsequent health care use for asthmatic patients in the united states. *J Asthma*. 2010;47(6):660–6.
16. El-Qutob D, Maillo M. New GINA guidelines: Controversy still exists. *Clin Pulm Med*. 2020;27(3):61–3.
17. Kuprys-Lipinska I, Kolacinska-Flont M, Kuna P. New approach to intermittent and mild asthma therapy: Evolution or revolution in the GINA guidelines? *Clin Transl Allergy* [Internet]. 2020;10(1):1–14. Available from: <https://doi.org/10.1186/s13601-020-00316-z>
18. O'Byrne PM, Jenkins C, Bateman ED. The paradoxes of asthma management: Time for a new approach? *Eur Respir J* [Internet]. 2017;50(3):1–8. Available from: <http://dx.doi.org/10.1183/13993003.01103-2017>
19. Nwaru BI, Ekström M, Hasvold P, Wiklund F, Telg G, Janson C. Overuse of short-acting  $\beta$ 2-agonists in asthma is associated with increased risk of exacerbation and mortality: A nationwide cohort study of the global SABINA programme. *Eur Respir J* [Internet]. 2020;55(4). Available from: <http://dx.doi.org/10.1183/13993003.01872-2019>
20. FitzGerald JM, Tavakoli H, Lynd LD, Al Efraij K, Sadatsafavi M. The impact

- of inappropriate use of short acting beta agonists in asthma. *Respir Med* [Internet]. 2017;131:135–40. Available from: <https://doi.org/10.1016/j.rmed.2017.08.014>
21. Stridsman C, Axelsson M, Warm K, Backman H. Uncontrolled asthma occurs in all GINA treatment steps and is associated with worse physical health – a report from the OLIN adult asthma cohort. *J Asthma* [Internet]. 2020;0(0):1–10. Available from: <https://doi.org/10.1080/02770903.2020.1713150>
  22. Global Initiative for Asthma. What's new in GINA 2019. 2019.
  23. Tortora GJ, Derrickson B, Wiley J. *ANATOMY & PHYSIOLOGY* 13th Edition. 2012. 1347 p.
  24. Sherwood L, Ward C. *Human Physiology: From Cells to Systems* 4th Canadian Edition. 2019. 223–224 p.
  25. Paulsen F, Waschke J. *Sobotta Atlas of Anatomy*. 16th ed. Elsevier; 2018. 1–310 p.
  26. Drake RL, Vogl AW, Mitchell AWM. *Gray's Anatomy for students*. 4th ed. Vol. 4, Elsevier. 2019. 1–1180 p.
  27. Gartner L p., Hiatt JL. *Color Textbook of Histology*. 3rd ed. Elsevier. Elsevier; 573 p.
  28. Anthony L, Mescher P. *Junqueira's Basic Histology : Text & Atlas*. 15th ed. Morphologia. Mc Graw Hill Education; 2018. 1–529 p.
  29. Sherwood L. *Human Physiology From Cells to Systems*. 7th ed. Canada; 2010. 462 p.
  30. Goldman L, Scaefer AI. *GOLDMAN'S CECIL MEDICINE*. 24th ed. ELSEVIEER; 1–2569 p.
  31. Syarifudin, Koentjahja. KORTIKOSTEROID PADA ASMA KRONIS [Internet]. Perhimpunan Dokter Paru Indonesia. 2019. Available from: <https://www.klikpdpi.com/index.php?mod=article&sel=8848>
  32. Kumar V, Abbas AK, Aster JC. *Robbins Basic pathology*. 9th ed. Elsevier. Elsevier; 2012. 1–910 p.

33. INFODATIN [Internet]. Pusat Data dan Informasi Kementerian Kesehatan RI. 2015. p. 8. Available from: <https://www.kemkes.go.id/folder/view/01/structure-publikasi-pusdatin-info-datin.html>
34. National Asthma Education and Prevention Program. Expert Panel Report 3 : Guidelines for the Diagnosis and Management of Asthma Full Report 2007. National Heart, Lung, and Blood Institute. 2007.
35. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention [Internet]. 2019. Available from: [www.ginasthma.org](http://www.ginasthma.org)
36. Kindt, Goldsby, Osborne. Kubby Immunology. Vol. 6th. 2005. 554 p.
37. Katzung, Bertram G., Masters, Susan B., Trevor AJ. Farmakologi Dasar & Klinik. 12th ed. Mc Graw Hill Companies; 2012. 1245 p.
38. Brunton LL. Goodman & Gilman's The Pharmacological Basis of Therapeutics. 13th Editi. Mc Graw Hill Education; 2018. 1423 p.
39. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention [Internet]. 2021. Available from: [www.ginasthma.org](http://www.ginasthma.org)
40. Sears MR, Lötvall J. Past, present and future -  $\beta$ 2-adrenoceptor agonists in asthma management. *Respir Med*. 2005;99(2):152–70.
41. Cullum VA, Farmer JB, Jack D, Levy GP. Salbutamol: a new, selective beta-adrenoceptor stimulant. *Br J Pharmacol*. 1969;35(1):141–51.
42. Bergman J, Persson H, Wetterlin K. Two New Groups of Selective Stimulants of Adrenergic  $\beta$ -Receptors. In 1969. p. 899–901.
43. Persson H, Olsson T. Some Pharmacological Properties of Terbutaline (INN), 1-(3,5-Dihydroxyphenyl)-2-(T-Butylamino)-Ethanol. A New Sympathomimetic  $\beta$ -Receptor-Stimulating Agent. In *Acta Medica Scandinavica suppl. 512*; 1970. p. 11–9.
44. Pearce N, Hensley MJ. Epidemiologic studies of beta agonists and asthma deaths. *Epidemiol Rev*. 1998;20(2):173–86.
45. Crane J, Pearce N, Flatt A, Burgess C, Jackson R, Kwong T, et al. Prescribed fenoterol and death from asthma in New Zealand, 1981-83: case-control study.

- Lancet. 1989;333(8644):917–22.
46. Beasley R, Pearce N, Crane J, Burgess C. Withdrawal of Fenoterol and the End of the New Zealand Asthma Mortality Epidemic. In Int Arch Allergy Immunol; 1995. p. 325–7.
  47. Spitzer WO, Suissa S, Ernst P, Horwitz RI, Habbick B, Cockcroft D, et al. The use of beta agonists and the risk of death and near death from asthma. 1992;326:501–6.
  48. Suissa S, Ernst P, Boivin JF, Horwitz RI, Habbick B, Cockcroft D, et al. A cohort analysis of excess mortality in asthma and the use of inhaled  $\beta$ -agonists. Am J Respir Crit Care Med. 1994;149(3 I):604–10.
  49. Blais L, Suissa S, Boivin JF, Ernst P. First treatment with inhaled corticosteroids and the prevention of admissions to hospital for asthma. Am J Respir Crit Care Med. 1998;158(1):1025–9.
  50. Suissa S, Ernst P, Benayoun S, Baltzan M, Cai B. Low-dose inhaled corticosteroid and the prevention of death from asthma. Njm. 2000;332–6.
  51. Hancox RJ, Cowan JO, Flannery EM, Herbison GP, McLachlan CR, Taylor DR. Bronchodilator tolerance and rebound bronchoconstriction during regular inhaled  $\beta$ -agonist treatment. Respir Med. 2000;94(8):767–71.
  52. Aldridge RE, Hancox RJ, Taylor DR, Cowan JANO, Winn MC, Frampton CM, et al. Effects of Terbutaline and Budesonide on Sputum Cells and Bronchial Hyperresponsiveness In Asthma. 2000;161:1459–64.
  53. Kivistö JE, Karjalainen J, Huhtala H, Protudjer JLP. The use of short-acting beta-2 adrenergic receptor agonists for asthma increased among Finnish and Swedish children from 2006 to 2017. Acta Paediatr Int J Paediatr. 2020;109(8):1620–6.
  54. Janson C, Menzies-Gow A, Nan C, Nuevo J, Papi A, Quint JK, et al. SABINA: An Overview of Short-Acting  $\beta$ 2-Agonist Use in Asthma in European Countries. Adv Ther [Internet]. 2020;37(3):1124–35. Available from: <https://doi.org/10.1007/s12325-020-01233-0>

55. Levy ML, Andrews R, Buckingham R, Evans H, Francis C, Houston R, et al. Why asthma still kills: The National Review of Asthma Deaths (NRAD) [Internet]. Royal College of Physicians. 2014. 1–115 p. Available from: <https://www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills>
56. Kaplan A, Mitchell PD, Cave AJ, Gagnon R, Foran V, Ellis AK. Effective Asthma Management: Is It Time to Let the AIR out of SABA? *J Clin Med.* 2020;9(4):921.
57. Amin S, Soliman M, McIvor A, Cave A, Cabrera C. Usage Patterns of Short-Acting  $\beta_2$ -Agonists and Inhaled Corticosteroids in Asthma: A Targeted Literature Review. *J Allergy Clin Immunol Pract* [Internet]. 2020;8(8):2556-2564.e8. Available from: <https://doi.org/10.1016/j.jaip.2020.03.013>
58. Muneshwarao J, Hassali MA, Ibrahim B, Saini B, Ali IAH, Verma AK. It is time to change the way we manage mild asthma: An update in GINA 2019. *Respir Res.* 2019;20(1):1–6.
59. McIvor A, Kaplan A. A call to action for improving clinical outcomes in patients with asthma. *npj Prim Care Respir Med* [Internet]. 2020;30(1):1–5. Available from: <http://dx.doi.org/10.1038/s41533-020-00211-x>
60. Graden A, Gandhi S, Joshi AY. Case report: Paradoxical responses to short acting beta-agonists in a pediatric patient. *J Asthma* [Internet]. 2021;58(2):213–5. Available from: <https://doi.org/10.1080/02770903.2019.1668009>
61. Sadatsafavi M, Tavakoli H, Lynd L, FitzGerald JM. Has Asthma Medication Use Caught Up With the Evidence?: A 12-Year Population-Based Study of Trends. *Chest* [Internet]. 2017;151(3):612–8. Available from: <http://dx.doi.org/10.1016/j.chest.2016.10.028>
62. Lin J, Zhou X, Wang C, Liu C, Cai S, Huang M. Symbicort® Maintenance and Reliever Therapy (SMART) and the evolution of asthma management within the GINA guidelines. *Expert Rev Respir Med* [Internet]. 2018;12(3):191–202. Available from: <https://doi.org/10.1080/17476348.2018.1429921>
63. Beasley R, Weatherall M, Shirtcliffe P, Hancox R, Reddel HK. Combination

- corticosteroid/β-agonist inhaler as reliever therapy: A solution for intermittent and mild asthma? *J Allergy Clin Immunol* [Internet]. 2014;133(1):39–41. Available from: <http://dx.doi.org/10.1016/j.jaci.2013.10.053>
64. Kew KM, Karner C, Mindus SM, Ferrara G. Combination formoterol and budesonide as maintenance and reliever therapy versus combination inhaler maintenance for chronic asthma in adults and children. *Cochrane Database Syst Rev*. 2013;2013(12).
65. O'Byrne PM, FitzGerald JM, Bateman ED, Barnes PJ, Zhong N, Keen C, et al. Inhaled Combined Budesonide–Formoterol as Needed in Mild Asthma. *N Engl J Med*. 2018;378(20):1865–76.
66. Sobieraj DM, Weeda ER, Nguyen E, Coleman CI, Michael White C, Lazarus SC, et al. Association of inhaled corticosteroids and long-acting β-agonists as controller and quick relief therapy with exacerbations and symptom control in persistent asthma a systematic review and meta-analysis. *JAMA - J Am Med Assoc*. 2018;319(14):1485–96.
67. Loymans RJB, Gemperli A, Cohen J, Rubinstein SM, Sterk PJ, Reddel HK, et al. Comparative effectiveness of long term drug treatment strategies to prevent asthma exacerbations: Network meta-analysis. *BMJ*. 2014;348(May):1–16.
68. Beasley R, Holliday M, Reddel HK, Braithwaite I, Ebmeier S, Hancox RJ, et al. Controlled Trial of Budesonide–Formoterol as Needed for Mild Asthma. *N Engl J Med*. 2019;380(21):2020–30.
69. Hills T, Beasley R. The history and future of short-acting beta<sub>2</sub>-agonist therapy in asthma. *Respirology*. 2020;25(3):246–8.
70. Cruz ÁA, Barile S, Nudo E, Brogelli L, Guller P, Papi A. ICS/formoterol in the management of asthma in the clinical practice of pulmonologists: an international survey on GINA strategy. *Asthma Res Pract*. 2021;7(1):1–7.
71. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention [Internet]. 2018. Available from: [www.ginasthma.org](http://www.ginasthma.org)
72. Bateman ED, Reddel HK, O'Byrne PM, Barnes PJ, Zhong N, Keen C, et al. As-

- Needed Budesonide–Formoterol versus Maintenance Budesonide in Mild Asthma. *N Engl J Med.* 2018;378(20):1877–87.
73. Whalen. Lippincott Illustrated Reviews: Pharmacology (Lippincott Illustrated Reviews Series) SEVENTH EDITION. Vol. 53, Journal of Chemical Information and Modeling. 2019.
74. Krishnan JA, Cloutier MM, Schatz M. National asthma education and prevention program 2020 guideline update: Where do we go from here? *Am J Respir Crit Care Med.* 2021;203(2):164–7.
75. Network SIG, Society BT. British guideline on the management of asthma [Internet]. Network SIG, Society BT, editors. Healthcare Improvement Scotland; 2019. 1–208 p. Available from: <https://www.brit-thoracic.org.uk/document-library/guidelines/asthma/btssign-guideline-for-the-management-of-asthma-2019/>
76. SIGN. SIGN 153 • British guideline on the management of asthma KEY TO EVIDENCE STATEMENTS AND GRADES OF RECOMMENDATIONS. Brith Thorac Soc. 2016;(September):8.
77. Billington CK, Penn RB, Hall IP.  $\beta$ 2 Agonists. In: Handbook of Experimental Pharmacology [Internet]. 2016. p. 23–40. Available from: [http://link.springer.com/10.1007/164\\_2016\\_64](http://link.springer.com/10.1007/164_2016_64)
78. Lanes SF, Lanza LL, Wentworth CE. Risk of emergency care, hospitalization, and ICU stays for acute asthma among recipients of salmeterol. *Am J Respir Crit Care Med.* 1998;158(3):857–61.