

DAFTAR PUSTAKA

1. Raveendra N, Rathnakara SH, Haswani N, Subramaniam V. Bacterial Biofilms on Tracheostomy Tubes. *Indian J Otolaryngol Head Neck Surg.* 2022;74:p.1-5.
2. Paul P, Peter C. Upper Airway Obstruction and Tracheostomy. In Scott-Brown's Otorhinolaryngology Head and Neck Surgery. Vol 3. 8th ed. Watkinson J, Clarke R, editors. Florida: CRC Press; 2018. p. 1037-48.
3. Novialdi, Azani S. Trakeostomi dan Krikotirotomi. *J Kesehat Andalas.* 2019;1(1):p.1-9.
4. Raimonde A, Westhoven N, Winters R. Tracheostomy. Ohio: StatPearls; 2023. p. 1–21.
5. Saravanam PK, Jayagandhi S, Shajahan S. Microbial Profile in Tracheostomy Tube and Tracheostoma: A Prospective Study. *Indian J Otolaryngol Head Neck Surg.* 2022;74:p.1740-3.
6. Tenri Sanna A. Perbandingan Kadar Eosinofil dan Netrofil Mukosa Hidung pada Pasien Pasca Trakeostomi di Makassar. *Media Publ Promosi Kesehatan Indones.* 2019;2(9):p.215-8.
7. Handoko C, Murdiyo MD. Foreign body of fractured tracheal cannula in the bronchus after tracheostomy. 2023;53(2):p.196-202.
8. Lewith H, Athanassoglou V. Update on management of tracheostomy. *BJA Educ.* 2019;19(11):p.370-6.
9. Bontempo LJ, Manning SL. Tracheostomy Emergencies. *Emerg Med Clin North Am.* 2019;37(1):p.109-9.
10. Subramaniam DR, Willging JP, Gutmark EJ, Oren L. How design characteristics of tracheostomy tubes affect the cannula and tracheal flows. *Laryngoscope.* 2019;129(8):p.1791-9.
11. Das P, Zhu H, Shah RK, Roberson DW, Berry J, Skinner ML. Tracheotomy-related catastrophic events: Results of a national survey. *Laryngoscope.* 2012;122(1):p.30-7.
12. Asyari A, Sari AM, Novialdi, Dini E, Fitri F, Indrama E, et al. Deteksi Biofilm Bakteri Aerob Pada Usapan Tonsil Dengan Metode Tube Pada Penderita Tonsilitis Kronis Tesis. Orli. 2019;49(1):p.48-56.
13. Treter J, Macedo a J. Catheters: a suitable surface for biofilm formation. *Sci against Microb Pathog Commun Curr Res Technol Adv.* 2011;1(1):p.835-42.
14. Solomon DH, Wobb J, Buttaro BA, Truant A, Soliman AMS. Characterization of Bacterial Biofilms on Tracheostomy Tubes. 2009;119(8):p.1633-8.
15. Hess DR, Altobelli NP. Tracheostomy tubes. *Respir Care.* 2014;59(6):p.956-73.
16. Smolar DE, Ho B, Kent SM, Hughes CA, Mettenburg D, Rueggeberg FA, et al. Changes in pediatric tracheostomy tubes exposed to home dishwashing. *Int J Pediatr Otorhinolaryngol.* 2017;100(6):p.96-102.
17. Wicaksana P, Wulandari D, Kusuma A, Sastrowijoto S. The difference in biofilms formations on duration less than 90 d and more than 90 d of tracheotomy cannula usage. *J Med Sci.* 2023;55(1):53–9.

18. Li P, Yin R, Cheng J, Lin J. Bacterial Biofilm Formation on Biomaterials and Approaches to Its Treatment and Prevention. *Int J Mol Sci.* 2023;24(14):p.1-20.
19. Backman S, Björling G, Johansson UB, Lysdahl M, Markström A, Schedin U, et al. Material wear of Polymeric tracheostomy tubes: A six-month study. *Laryngoscope.* 2009;119(4):p.657-64.
20. Mat Baki M. Prolong Placement of Tracheostomy Tube Causing Unusual Complication. *Med Health.* 2016;11(2):298–302.
21. Kumarasinghe D, Wong EH, Duvnjak M, Smith MC, Palme CE, Riffat F. Colonization rates of tracheostomy tubes associated with the frequency of tube changes. *ANZ J Surg.* 2020;90(11):2310–4.
22. Rodney J, Ojano-dirain CP, Antonelli PJ, Silva RC. Effect of Repeated Tracheostomy Tube Reprocessing on Biofilm Formation. *Laryngoscope.* 2016;126(4):p.996-9.
23. Macià MD, Rojo-Molinero E, Oliver A. Antimicrobial susceptibility testing in biofilm-growing bacteria. *Clin Microbiol Infect.* 2014;20(10):p.981-90.
24. Hassan A, Usman J, Kaleem F, Omair M, Khalid A, Iqbal M. Evaluation of different detection methods of biofilm formation in the clinical isolates. *Brazilian J Infect Dis.* 2011;15(4):p.305-11.
25. Hutauruk SM, Hermani B, Monasari P. Role of chlorhexidine on tracheostomy cannula decontamination in relation to the growth of Biofilm-Forming Bacteria Colony- a randomized controlled trial study. *Ann Med Surg.* 2021;67(6):p.1-7.
26. Cader SHA, Shah FA, Nair SKGR. Tracheostomy colonisation and microbiological isolates of patients in intensive care units-a retrospective study. *World J Otorhinolaryngol - Head Neck Surg.* 2020;6(1):p.49-52.
27. Tuon FF, Dantas LR, Suss PH, Tasca Ribeiro VS. Pathogenesis of the *Pseudomonas aeruginosa* Biofilm: A Review. *Pathogens.* 2022;11(3):p.1-19.
28. Acharya R, Wakode PT, Bhandary S, Khanal B, Khatiwada S. Colonization and infection in tracheostomized patients at tertiary care hospital in Eastern Nepal. *Heal Renaiss.* 2014;12(2):p.68-73.
29. Ochońska D, Ścibik Ł, Brzywczy-Włoch M. Biofilm formation of clinical *klebsiella pneumoniae* strains isolated from tracheostomy tubes and their association with antimicrobial resistance, virulence and genetic diversity. *Pathogens.* 2021;10(10):p.1-15.
30. Ścibik Ł, Ochońska D, Gołda-Cępa M, Brzywczy-Włoch M, Kotarba A. Microbiological analysis of tracheostomy tube biofilms and antibiotic resistance profiles of potentially pathogenic microorganisms. *Otolaryngol Pol.* 2022;76(5):p.8-21.
31. Drożdż K, Ochońska D, Ścibik Ł, Gołda-Cępa M, Biegun K, Brzywczy-Włoch M. The Frequency of Occurrence of Resistance and Genes Involved in the Process of Adhesion and Accumulation of Biofilm in *Staphylococcus aureus* Strains Isolated from Tracheostomy Tubes. *Microorganisms.* 2022;10(6):p.1-15.
32. Gu X, Keyoumu Y, Long L, Zhang H. Detection of bacterial biofilms in different types of chronic otitis media. *Eur Arch Oto-Rhino-Laryngology.* 2014;271(11):2877–83.

33. Grosse-Onnebrink J, Rudloff J, Kessler C, Werner C, Dougherty GW, Kerschke L, et al. *Acinetobacter baumannii* Is a Risk Factor for Lower Respiratory Tract Infections in Children and Adolescents with a Tracheostomy. *Pediatr Infect Dis J*. 2019;38(10):p.1005-9.
34. Khariri K, Amalia N, Nursofiah S, Muna F, Rukminiati Y, Penelitian dan Pengembangan Biomedis dan Teknologi Dasar Kesehatan P. Akankah Perkembangan Metode Deteksi Biomolekuler Era 4.0 Mampu Menggantikan Pemeriksaan Laboratorium Bakteri Secara Konvensional? *Semin Nas Ris Kedokt*. 2020;1(1):p.380-5.
35. Neeff M, Biswas K, Hoggard M, Taylor MW, Douglas R. Molecular microbiological profile of chronic suppurative otitis media. *J Clin Microbiol*. 2016;54(10):p.2538-46.
36. Harika K, Shenoy V, Narasimhaswamy N, Chawla K. Detection of biofilm production and its impact on antibiotic resistance profile of bacterial isolates from chronic wound infections. *J Glob Infect Dis*. 2020;12(3):129–34.
37. Basnet A, Tamang B, Shrestha MR, Shrestha LB, Rai JR, Maharjan R, et al. Assessment of four in vitro phenotypic biofilm detection methods in relation to antimicrobial resistance in aerobic clinical bacterial isolates. *PLoS One*. 2023;18(11):p.1-15.
38. Hermani B, Fardizza F, Novialdi. Laringitis. In: *Modul Laring Faring*. 3rd ed. Hermani B, Fardizza F, Novialdi, editors. Jakarta; 2022. p. 21-38.
39. Furlow PW, Mathisen DJ. Surgical anatomy of the trachea. *Ann Cardiothorac Surg*. 2018;7(2):255–60.
40. Warner L, Jennings C, Watkinson J. Surgical Anatomy of the Neck. In: *Cummings Otolaryngology Head and Neck Surgery*. 7th Ed. Flint P, Francis H, Haughey B, editors. Philadelphia: Elsevier; 2021. p. 541-64.
41. Cheung NH, Napolitano LM. Tracheostomy: Epidemiology, indications, timing, technique, and outcomes. *Respir Care*. 2014;59(6):895–919.
42. Berutu VP, Lubis B. Gambaran Trakeostomi terhadap Length of Stay Pasien yang Dirawat di ICU RSUP Haji Adam Malik Medan Tahun 2021. *Maj Anest Crit Care*. 2023;41(3):p.164-70.
43. Dhingra P, Dhingra S. Tracheostomy and Other Procedure for Airway Management. In: *Diseases of Ear, Nose and Throat & Head and Neck Surgery*. Seventh ed. Dhingra P, Dhingra S, editors. New Delhi: Elsevier; 2018. p. 359-64.
44. Karen MK. Advanced Airway Management - Intubation and Tracheostomy. In: *Bailey's Head & Neck Surgery Otorinolaryngology*. Vol 1. 5th ed. Berrylin F, Matthew R, editors. Philadelphia: Lippincott Williams & Wilkins.; 2014. p. 908-44.
45. Kraft S, Schindler J. Tracheotomy. In: *Cummings Otolaryngology Head and Neck Surgery*. In: Flint P, Francis H, Haughey B, editors. 7th Ed. Philadelphia: Elsevier; 2021. p. 81–9.
46. Freeman BD. Tracheostomy Update: When and How. *Crit Care Clin*. 2017;33(2):p.311-22.
47. Hermani B, Fardizza F, Novialdi. Sumbatan Jalan Nafas Atas. In: *Modul Laring Faring*. 3rd ed. Hermani B, Fardizza F, Novialdi, editors. Jakarta; 2022. p. 294-307.

48. Ramanathan K, Antognini D, Combes A, Paden M, Zakhary B, Ogino M, et al. Tracheostomy in the COVID-19 era: global and multidisciplinary guidance. *Lancet Respir Med*. 2020;8(7):p.717-25.
49. Kwon MA, Cho C, Park JH. Life-threatening tension pneumothorax after unsuccessful tracheostomy tube exchange in a trauma patient - A case report. *Anesth Pain Med*. 2020;15(1):p.124-8.
50. Thi MTT, Wibowo D, Rehm, H.A. B. *Pseudomonas aeruginosa* Biofilms. *Int J Mol Sci Rev*. 2020;21(11):p.1-25.
51. Bassetti M, Vena A, Croxatto A, Righi E, Guery B. How to manage *Pseudomonas aeruginosa* infections. *Drugs Context*. 2018;7(1):p.1-18.
52. Jarrett WA, Ribes J, Manaligod JM. Biofilm formation on tracheostomy tubes. *Ear, Nose Throat J*. 2002;81(9):p.659-61.
53. Guerra MES, Destro G, Vieira B, Lima AS, Ferraz LFC, Hakansson AP, et al. *Klebsiella pneumoniae* Biofilms and Their Role in Disease Pathogenesis. *Front Cell Infect Microbiol*. 2022;12(5):p.1-13.
54. Idrees M, Sawant S, Karodia N, Rahman A. *Staphylococcus aureus* biofilm: Morphology, genetics, pathogenesis and treatment strategies. *Int J Environ Res Public Health*. 2021;18(7):p.1-20.
55. Sharma G, Sharma S, Sharma P, Chandola D, Dang S, Gupta S, et al. *Escherichia coli* biofilm: development and therapeutic strategies. *J Appl Microbiol*. 2016;121(2):p.309-19.
56. Gedefie A, Demsis W, Ashagrie M, Kassa Y, Tesfaye M, Tilahun M, et al. *Acinetobacter baumannii* biofilm formation and its role in disease pathogenesis: A review. *Infect Drug Resist*. 2021;14(9):p.3711-9.
57. Edward Y, Novianti D. Biofilm Pada Otitis Media Supuratif Kronik. *JAMBI Med J "Jurnal Kedokt Dan Kesehatan."* 2015;3(1):p.68-78.
58. Dhingra P, Dhingra S. Disorders of Middle Ear. In: *Diseases of Ear, Nose and Throat & Head and Neck Surgery*. Seventh ed. Dhingra P, Dhingra S, editors. New Delhi: Elsevier; 2018. p. 70-1.
59. Alotaibi GF. Factors Influencing Bacterial Biofilm Formation and Development. *Am J Biomed Sci Res*. 2021;12(6):617-26.
60. Karaguler T, Kahraman H, Tuter M. Analyzing effects of ELF electromagnetic fields on removing bacterial biofilm. *Biocybern Biomed Eng*. 2017;37(2):336-40.
61. Goudarzi M, Navidinia M, Khadembashi N, Rasouli R. Biofilm matrix formation in human: Clinical significance, diagnostic techniques, and therapeutic drugs. *Arch Clin Infect Dis*. 2021;16(3):p.1-10.
62. Lima JL da C, Alves LR, Jacomé PRL de A, Bezerra Neto JP, Maciel MAV, Morais MMC de. Biofilm production by clinical isolates of *Pseudomonas aeruginosa* and structural changes in LasR protein of isolates non biofilm-producing. *Brazilian J Infect Dis*. 2018;22(2):129-36.
63. Yolazenia Y, Budiman BJ, Huriyati E, Djamal A, Machmud R, Irfandy D. Peran biofilm bakteri terhadap derajat keparahan rinosinusitis kronis berdasarkan skor Lund-Mackay. *Oto Rhino Laryngol Indones*. 2017;47(2):p.113-22.
64. Saify H, Patidar RK, Khare M, Sahare KN, Singh V. Difference in biofilm development capability of vancomycin and ciprofloxacin resistant *Staphylococcus aureus* clinical isolates. *Res J Infect Dis*. 2013;1(1):p.1-4.

65. Kırmusaoğlu S. The Methods for Detection of Biofilm and Screening Antibiofilm Activity of Agents. *Antimicrob Antibiot Resist Antibiofilm Strateg Act Methods*. 2019;1–17.
66. Veerachamy S, Yarlalagadda T, Manivasagam G, Yarlalagadda PK. Bacterial adherence and biofilm formation on medical implants: A review. *Proc Inst Mech Eng Part H J Eng Med*. 2014;228(10):p.1083-99.
67. Ścibik Ł, Ochońska D, Gołda-Cępa M, Kwiecień K, Pamuła E, Kotarba A, et al. Sonochemical Deposition of Gentamicin Nanoparticles at the PCV Tracheostomy Tube Surface Limiting Bacterial Biofilm Formation. *Materials (Basel)*. 2023;16(10):p.1-14.
68. Meslemani D, Yaremchuk K, Rontal M. The presence of biofilms on adult tracheotomy tubes. *Laryngoscope*. 2009;119(3):p.122.
69. Björling G. Long-term Tracheostomy– Outcome, Cannula Care, and Material Wear. 1st ed. Björling G, editor. Stockholm: Karolinska Institutet.; 2007. p. 5-77.
70. Dahlan M. Besar Sampel Dan Cara Pengambilan Sampel Dalam Penelitian. 3rd ed. Susila A, editor. Vol. 7, *Jurnal Ilmu Pendidikan*. Jakarta: Salemba Medika; 2021. p. 61.
71. Kumarasinghe D, Wong E, Duvnjak M, Sritharan N, Smith MC, Palme C, et al. Risk factors associated with microbial colonisation and infection of tracheostomy tubes. *Am J Otolaryngol - Head Neck Med Surg*. 2020;41(4).
72. Diaconu O, Siritopol I, Polosanu LI, Grigoras I. Endotracheal Tube Biofilm and its Impact on the Pathogenesis of Ventilator-Associated Pneumonia. *J Crit Care Med*. 2018;4(2):p.50-5.
73. de Barros CE, de Almeida JA, e Silva MH, da Silva Ayres GH, de Oliveira CG, da Silva Bitencourt Braga CA, et al. Pediatric tracheostomy: Epidemiology and characterization of tracheal secretion - A literature review. *Rev Assoc Med Bras*. 2019;65(12):1502–7.
74. Sakurai S, Ono T, Amanai T, Shinohara H, Toya S, Tanaka A, et al. Detection of *Pseudomonas aeruginosa* following tracheostomy. *Oral Ther Pharmacol*. 2005;24(1):p.7-12.
75. Ezeador CO, Ejikeugwu PC, Ushie SN, Agbakoba NR. Isolation, Identification And Prevalence Of *Pseudomonas Aeruginosa* Isolates From Clinical And Environmental Sources In Onitsha Metropolis, Anambra State. *Eur J Med Heal Sci*. 2020;2(2):p.1-5.
76. Effah CY, Sun T, Liu S, Wu Y. *Klebsiella pneumoniae*: An increasing threat to public health. *Ann Clin Microbiol Antimicrob* [Internet]. 2020;19(1):1–9. Available from: <https://doi.org/10.1186/s12941-019-0343-8>
77. Chen IR, Lin SN, Wu XN, Chou SH, Wang F Der, Lin YT. Clinical and Microbiological Characteristics of Bacteremic Pneumonia Caused by *Klebsiella pneumoniae*. *Front Cell Infect Microbiol*. 2022;12(June):1–9.
78. Reyes J, Aguilar AC, Caicedo A. Carbapenem-resistant *Klebsiella pneumoniae*: Microbiology key points for clinical practice. *Int J Gen Med*. 2019;12(1):p.437-46.
79. Armbruster CE, Mobley HLT, Pearson MM. Pathogenesis of *Proteus mirabilis* Infection. *EcoSal Plus*. 2018;8(1):p.1-73.

80. Wasfi R, Hamed SM, Amer MA, Fahmy LI. *Proteus mirabilis* Biofilm: Development and Therapeutic Strategies. *Front Cell Infect Microbiol.* 2020;10(8):p.1-14.
81. Greene C, Wu J, Rickard AH, Xi C. Evaluation of the ability of *Acinetobacter baumannii* to form biofilms on six different biomedical relevant surfaces. *Lett Appl Microbiol.* 2016;63(4):233–9.
82. Whiteway C, Breine A, Philippe C, Van der Henst C. *Acinetobacter baumannii*. *Trends Microbiol.* 2022;30(2):p.199-200.
83. Morris FC, Dexter C, Kostoulias X, Uddin MI, Peleg AY. The Mechanisms of Disease Caused by *Acinetobacter baumannii*. *Front Microbiol.* 2019;10(7):p.1-20.
84. Pakharukova N, Tuittila M, Paavilainen S, Malmi H, Parilova O, Teneberg S, et al. Structural basis for *Acinetobacter baumannii* biofilm formation. *Proc Natl Acad Sci U S A.* 2018;115(21):5558–63.
85. Freeman J, Duvnjak M, Viola-Moll M, Riffat F. Tracheostomised patients in the community have lower rates of tube colonisation. *Aust J Otolaryngol.* 2021;4(6):p.6-11.
86. Zhou F, Wang D, Hu J, Zhang Y, Tan BK, Lin S. Control Measurements of *Escherichia coli* Biofilm: A Review. *Foods.* 2022;11(16):p.1-11.
87. Annavajhala MK, Gomez-Simmonds A, Uhlemann AC. Multidrug-resistant *Enterobacter cloacae* complex emerging as a global, diversifying threat. *Front Microbiol.* 2019;10(1):p.1-8.
88. Davin-Regli A, Pagès JM. *Enterobacter aerogenes* and *Enterobacter cloacae*; Versatile bacterial pathogens confronting antibiotic treatment. *Front Microbiol.* 2015;6(MAY):1–10.
89. Liu S, Chen L, Wang L, Zhou B, Ye D, Zheng X, et al. Cluster Differences in Antibiotic Resistance, Biofilm Formation, Mobility, and Virulence of Clinical *Enterobacter cloacae* Complex. *Front Microbiol.* 2022;13(April):1–10.
90. Misra T, Tare M, Jha PN. Insights Into the Dynamics and Composition of Biofilm Formed by Environmental Isolate of *Enterobacter cloacae*. *Front Microbiol.* 2022;13(July).
91. Sultan AM, Nabel Y. Tube method and Congo red agar versus tissue culture plate method for detection of biofilm production by uropathogens isolated from midstream urine: Which one could be better? *African J Clin Exp Microbiol.* 2018;20(1):p.60-6.
92. Halim RMA, Kassem NN, Mahmoud BS. Detection of biofilm producing staphylococci among different clinical isolates and its relation to methicillin susceptibility. *Open Access Maced J Med Sci.* 2018;6(8):1335–41.
93. Coffey BM, Anderson GG. Biofilm formation in the 96-well microtiter plate. *Methods Mol Biol.* 2014;1149:631–41.
94. Francolini I, Hall-Stoodley L, Stoodley P. Biofilms, Biomaterials, and Device-Related Infections [Internet]. Fourth Edi. *Biomaterials Science: An Introduction to Materials in Medicine.* Elsevier; 2020. p. 823-40. Available from: <http://dx.doi.org/10.1016/B978-0-12-816137-1.00054-4>

95. Kim SW, Lee JS, Cho EH, Choi HG. A Case of Granulate on Tissue Formation after Tracheostomy without Management for 5 Weeks. *J Clin Otolaryngol Head Neck Surg.* 2020;31(2):248–52.
96. Alsunaid S, Holden VK, Kohli A, Diaz J, O’Meara LB. Wound care management: Tracheostomy and gastrostomy. *J Thorac Dis.* 2021;13(8):5297–313.
97. Łukomska-Szymańska M, Sokołowski J, Łapińska B. Chlorhexidine – mechanism of action and its application to dentistry. *J Stomatol.* 2017;70(4):p.405-17.

