

## Daftar Pustaka

- Ball, L., van der Hoeven, S., Costantino, F., van Meenen, D.M., Pelosi, P., Beenen, L.F., Schultz, M.J., Paulus, F., 2020. Effects of nebulized acetylcysteine plus salbutamol on endotracheal tube secretions accumulation: sub-study of a randomized controlled trial. *European Respiratory Society (ERS)*, p. 2010. <https://doi.org/10.1183/13993003.congress-2020.2010>
- Blasi, F., Page, C., Rossolini, G.M., Pallecchi, L., Matera, M.G., Rogliani, P., Cazzola, M., 2016. The effect of N-acetylcysteine on biofilms: Implications for the treatment of respiratory tract infections. *Respir Med*. <https://doi.org/10.1016/j.rmed.2016.06.015>
- Cohen TS, Parker D, Prince A, 2015. *Pseudomonas aeruginosa* Host Immune Evasion, in: Ramos JL, Goldberg JB, Filloux A (Eds.), *Pseudomonas New Aspects of Pseudomonas Biology*. Springer, New York, pp. 3–24.
- Costa, F., Sousa, D.M., Parreira, P., Lamghari, M., Gomes, P., Martins, M.C.L., 2017. N-acetylcysteine-functionalized coating avoids bacterial adhesion and biofilm formation. *Sci Rep* 7. <https://doi.org/10.1038/s41598-017-17310-4>
- Dahlan S, 2014. *Langkah-Langkah Membuat Proposal Penelitian Bidang Kedokteran dan Kesehatan Berdasar Prinsip Important, Konsisten, Valid, Etis*, 2nd ed. Sagung Seto, Jakarta.
- de Angelis, M., Mascellino, M.T., Miele, M.C., al Ismail, D., Colone, M., Stringaro, A., Vullo, V., Venditti, M., Mastroianni, C.M., Oliva, A., 2022. High Activity of N-Acetylcysteine in Combination with Beta-Lactams against Carbapenem-Resistant *Klebsiella pneumoniae* and *Acinetobacter baumannii*. *Antibiotics* 11. <https://doi.org/10.3390/antibiotics11020225>
- Diaconu, O., Siriopol, I., Poloşanu, L.I., Grigoraş, I., 2018. Endotracheal Tube Biofilm and its Impact on the Pathogenesis of Ventilator-Associated Pneumonia. *The Journal of Critical Care Medicine* 4, 50–55. <https://doi.org/10.2478/jccm-2018-0011>
- Eroshenko, D., Polyudova, T., Korobov, V., 2017. N-acetylcysteine inhibits growth, adhesion and biofilm formation of Gram-positive skin pathogens. *Microb Pathog* 105, 145–152. <https://doi.org/10.1016/j.micpath.2017.02.030>
- Fernández-Barat, L., Ben-Aicha, S., Motos, A., Vila, J., Marco, F., Rigol, M., Muñoz, L., Li Bassi, G., Ferrer, M., Torres, A., 2018. Assessment of in vivo versus in vitro biofilm formation of clinical methicillin-resistant *Staphylococcus aureus* isolates from endotracheal tubes. *Sci Rep* 8. <https://doi.org/10.1038/s41598-018-30494-7>
- Fu, J., Zhang, Y., Lin, S., Zhang, W., Shu, G., Lin, J., Li, H., Xu, F., Tang, H., Peng, G., Zhao, L., Chen, S., Fu, H., 2021. Strategies for Interfering With Bacterial Early Stage Biofilms. *Front Microbiol*. <https://doi.org/10.3389/fmicb.2021.675843>
- Gil-Perotin, S., Ramirez, P., Marti, V., Sahuquillo, J.M., Gonzalez, E., Calleja, I., Menendez, R., Bonastre, J., 2012. Implications of endotracheal tube biofilm in ventilator-associated pneumonia response: A state of concept. *Crit Care* 16. <https://doi.org/10.1186/cc11357>
- Grasselli, G., Scaravilli, V., Mangioni, D., Scudeller, L., Alagna, L., Bartoletti, M., Bellani, G., Biagioni, E., Bonfanti, P., Bottino, N., Coloretti, I., Cutuli, S.L., de Pascale, G., Ferlicca, D., Fior, G., Forastieri, A.,

Franzetti, M., Greco, M., Guzzardella, A., Linguadoca, S., Meschiari, M., Messina, A., Monti, G., Morelli, P., Muscatello, A., Redaelli, S., Stefanini, F., Tonetti, T., Antonelli, M., Cecconi, M., Foti, G., Fumagalli, R., Girardis, M., Ranieri, M., Viale, P., Raviglione, M., Pesenti, A., Gori, A., Bandera, A., 2021. Hospital-Acquired Infections in Critically Ill Patients With COVID-19. *Chest* 160, 454–465. <https://doi.org/10.1016/j.chest.2021.04.002>

Guerini, M., Condrò, G., Friuli, V., Maggi, L., Perugini, P., 2022. N-acetylcysteine (NAC) and Its Role in Clinical Practice Management of Cystic Fibrosis (CF): A Review. *Pharmaceuticals*. <https://doi.org/10.3390/ph15020217>

Guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia, 2005. . *Am J Respir Crit Care Med*. <https://doi.org/10.1164/rccm.200405-6445T>

Guo, J., Wang, P., Ma, X., 2021. Effect of acetylcysteine solution combined with fiberoptic bronchoscopy alveolar lavage in elderly patients with severe ventilator-associated pneumonia. *Tropical Journal of Pharmaceutical Research* 20, 1061–1066. <https://doi.org/10.4314/tjpr.v20i5.25>

Harun SR, Putra ST, Chair I, Sastroasmoro S, 2014. Uji Klinis, in: Sastroasmoro S, Ismael S (Eds.), *Dasar-Dasar Metodologi Penelitian Klinis*. Sagung Seto, Jakarta, pp. 187–216.

Hassan, A., Usman, J., Kaleem, F., Omair, M., Khalid, A., Iqbal, M., 2011. Evaluation of different detection methods of biofilm formation in the clinical isolates. *The Brazilian Journal of Infectious Diseases* 15, 305–311. [https://doi.org/10.1016/s1413-8670\(11\)70197-0](https://doi.org/10.1016/s1413-8670(11)70197-0)

Idrees, M., Sawant, S., Karodia, N., Rahman, A., 2021. Staphylococcus aureus biofilm: Morphology, genetics, pathogenesis and treatment strategies. *Int J Environ Res Public Health*. <https://doi.org/10.3390/ijerph18147602>

Jamal, M., Ahmad, W., Andleeb, S., Jalil, F., Imran, M., Nawaz, M.A., Hussain, T., Ali, M., Rafiq, M., Kamil, M.A., 2018. Bacterial biofilm and associated infections. *Journal of the Chinese Medical Association*. <https://doi.org/10.1016/j.jcma.2017.07.012>

Jefferson, K.K., 2004. What drives bacteria to produce a biofilm? *FEMS Microbiol Lett*. <https://doi.org/10.1016/j.femsle.2004.06.005>

Kharel, S., Bist, A., Mishra, S.K., 2021. Ventilator-associated pneumonia among ICU patients in WHO Southeast Asian region: A systematic review. *PLoS One* 16. <https://doi.org/10.1371/journal.pone.0247832>

Lebeaux, D., Ghigo, J.-M., Beloin, C., 2014. Biofilm-Related Infections: Bridging the Gap between Clinical Management and Fundamental Aspects of Recalcitrance toward Antibiotics. *Microbiology and Molecular Biology Reviews* 78, 510–543. <https://doi.org/10.1128/mmb.00013-14>

Leone, M., Bouadma, L., Bouhemad, B., Brissaud, O., Dager, S., Gibot, S., Hraiech, S., Jung, B., Kipnis, E., Launey, Y., Luyt, C.E., Margetis, D., Michel, F., Mokart, D., Montravers, P., Monsel, A., Nseir, S., Pugin, J., Roquilly, A., Velly, L., Zahar, J.R., Bruyère, R., Chanques, G., 2018. Hospital-acquired pneumonia in ICU. *Anaesth Crit Care Pain Med* 37, 83–98. <https://doi.org/10.1016/j.accpm.2017.11.006>

Muhammad, M.H., Idris, A.L., Fan, X., Guo, Y., Yu, Y., Jin, X., Qiu, J., Guan, X., Huang, T., 2020. Beyond Risk: Bacterial Biofilms and Their Regulating Approaches. *Front Microbiol*. <https://doi.org/10.3389/fmicb.2020.00928>

Murray PR, Rosenthal KS, Michael AP, 2016. *Medical Microbiology*, 9th ed. Elsevier, Philadelphia.



Nair B Gritish, Niederman S Michael, 2014. Pneumonia : Considerations for the critically Ill Patient , in: Parillo E Joseph, Dellinger Phillip R (Eds.), Critical Care Medicine Principles of Diagnosis and Management in Adult. Elsevier Saunders, Philadelphia, pp. 708–712.

Olofsson, A.C., Hermansson, M., Elwing, H., 2003. N-acetyl-L-cysteine affects growth, extracellular polysaccharide production, and bacterial biofilm formation on solid surfaces. Appl Environ Microbiol 69, 4814–4822. <https://doi.org/10.1128/AEM.69.8.4814-4822.2003>

Pedre, B., Barayeu, U., Ezeriņa, D., Dick, T.P., 2021. The mechanism of action of N-acetylcysteine (NAC): The emerging role of H<sub>2</sub>S and sulfane sulfur species. Pharmacol Ther. <https://doi.org/10.1016/j.pharmthera.2021.107916>

Qu D, Ren XX, Guo LY, Liang JX, Xu WJ, Han YH, Zhu YM, 2016. Effect of N-acetylcysteine inhalation on ventilator-associated pneumonia caused by biofilm in endotracheal tubes. Zhonghua Er Ke Za Zhi 54, 278–282.

Qvortrup, K., Hultqvist, L.D., Nilsson, M., Jakobsen, T.H., Jansen, C.U., Uhd, J., Andersen, J.B., Nielsen, T.E., Givskov, M., Tolker-Nielsen, T., 2019. Small Molecule Anti-biofilm Agents Developed on the Basis of Mechanistic Understanding of Biofilm Formation. Front Chem. <https://doi.org/10.3389/fchem.2019.00742>

Sharafkhah, M., Abdolrazaghnejad, A., Zarinfar, N., Mohammadbeigi, A., Massoudifar, A., Abaszadeh, S., 2018. Safety and efficacy of N-acetyl-cysteine for prophylaxis of ventilator-associated pneumonia: A randomized, double blind, placebo-controlled clinical trial. Med Gas Res 8, 19–23. <https://doi.org/10.4103/2045-9912.229599>

Thorarinsdottir, H.R., Kander, T., Holmberg, A., Petronis, S., Klarin, B., 2020. Biofilm formation on three different endotracheal tubes: A prospective clinical trial. Crit Care. <https://doi.org/10.1186/s13054-020-03092-1>

Yin, S., Jiang, B., Huang, G., Zhang, Y., You, B., Chen, Y., Gong, Y., Chen, J., Yuan, Z., Zhao, Y., Li, M., Hu, F., Yang, Z., Peng, Y., 2018. The Interaction of N-Acetylcysteine and Serum Transferrin Promotes Bacterial Biofilm Formation. Cellular Physiology and Biochemistry 45, 1399–1409. <https://doi.org/10.1159/000487566>

Zhao, T., Liu, Y., 2010. N-acetylcysteine inhibit biofilms produced by Pseudomonas aeruginosa.