

DAFTAR PUSTAKA

- Almalki, M.A., & Varghese, R. (2020). Science Prevalence of catheter associated biofilm producing bacteria and their antibiotic sensitivity pattern. *J. King Saud Univ. - Sci.* 32 : 1427–1433.
- Alqarni, M.S. (2021). Catheter-Associated Urinary Tract Infection (CAUTI) in ICU patients. *Middle East J. Nurs.* 15 : 25–33.
- Anggi, A., Wijaya, D.W., & Ramayani, O.R. (2019). Risk factors for catheter-associated urinary tract infection and uropathogen bacterial profile in the intensive care unit in hospitals in Medan, Indonesia. *Open Access Maced. J. Med. Sci.* 7 : 3488–3492.
- Arendrup, M.C., & Patterson, T.F. (2017). Multidrug-resistant candida: Epidemiology, molecular mechanisms, and treatment. *J. Infect. Dis.* 216 : S445–S451.
- Asmarani, D., Sianipar, O., & Windawarti (2022). Hubungan Tindakan Kateterisasi Urin dengan Infeksi Saluran Kemih. Universitas Gadjah Mada.
- Asmare, Z., Awoke, T., Genet, C., Admas, A., Melese, A., & Mulu, W. (2024). Incidence of catheter-associated urinary tract infections by Gram-negative bacilli and their ESBL and carbapenemase production in specialized hospitals of Bahir Dar, northwest Ethiopia. *Antimicrob. Resist. Infect. Control* 13 : 1–12.
- Assefa, M., & Amare, A. (2022). Biofilm-Associated Multi-Drug Resistance in Hospital-Acquired Infections : A Review. *Infect. Drug Resist.* 15 : 5061–5068.
- Azeredo, J., Azevedo, N.F., Briandet, R., Cerca, N., Coenye, T., Costa, A.R., *et al.*

- (2017). Critical review on biofilm methods. *Crit. Rev. Microbiol.* 43 : 313–351.
- Azmy, M., Nawar, N., Mohiedden, M., & Warille, L. (2016). Electron Microscopic Assay Of Bacterial Biofilm Formed On Indwelling Urethral CatheterS. *J. Egypt. Soc. Parasitol.* 46 : 475–484.
- Baidya, S., Sharma, S., Mishra, S.K., Kattel, H.P., Parajuli, K., & Sherchand, J.B. (2021). Biofilm Formation by Pathogens Causing Ventilator-Associated Pneumonia at Intensive Care Units in a Tertiary Care Hospital: An Armor for Refuge. *Biomed Res. Int.* 2021.
- Barford, J.M.T., & Coates, A.R.M. (2009). The pathogenesis of catheter-associated urinary tract infection. *J. Infect. Prev.* 10 : 50–56.
- Becker, K., Heilmann, C., & Peters, G. (2014). Coagulase-negative staphylococci. *Clin. Microbiol. Rev.* 27 : 870–926.
- Ben-Aderet, M., Madhusudhan, M., Grein, J., Drucker, C., Nurok, M., Chan, A., *et al.* (2023). 2414. Pulling the Cord: Removal of Urinary Catheters before Urine Culture in a Cardiothoracic-Surgery ICU. *Open Forum Infect. Dis.*
- Bizuayehu, H., Bitew, A., Abdeta, A., & Ebrahim, S. (2022). Catheter-associated urinary tract infections in adult intensive care units at a selected tertiary hospital, Addis Ababa, Ethiopia. *PLoS One* 17 : 1–15.
- Cámara, M., Green, W., MacPhee, C.E., Rakowska, P.D., Raval, R., Richardson, M.C., *et al.* (2022). Economic significance of biofilms: a multidisciplinary and cross-sectoral challenge. *npj Biofilms Microbiomes* 8 : 1–8.
- CDC (2022). Urinary Tract Infection (Catheter-Associated Urinary Tract Infection

[CAUTI] and Non-Catheter-Associated Urinary Tract Infection [UTI])

Events Definitions : *Centers Dis. Control Prev.* 1–18.

Centers for Disease Control and Prevention (2023). National Healthcare Safety Network (NHSN) Patient Safety Component Manual. *Natl. Healthc. Saf. Netw. Patient Saf. Compon. Man.* 1–39.

Chandra, J., & Mukherjee, P.K. (2015). Candida Biofilms: Development, Architecture, and Resistance . *Microbiol. Spectr.* 3 : 115–134.

Chant, C., Smith, O.M., Marshall, J.C., & Friedrich, J.O. (2011). Relationship of catheter-associated urinary tract infection to mortality and length of stay in critically ill patients: A systematic review and meta-analysis of observational studies. *Crit. Care Med.* 39 : 1167–1173.

Clarke, K., Tong, D., Pan, Y., Easley, K.A., Norrick, B., Ko, C., *et al.* (2013). Reduction in catheter-associated urinary tract infections by bundling interventions. *Int. J. Qual. Heal. Care* 25 : 43–49.

Cortese, Y.J., Wagner, V.E., Tierney, M., Devine, D., & Fogarty, A. (2018). Review of catheter-associated urinary tract infections and in vitro urinary tract models. *J. Healthc. Eng.* 2018.

Davis, K. (2005). Reduction in catheter-associated urinary tract infections (CAUTIs) using a silver-coated 100% silicone Foley catheter verses a silver-coated latex Foley catheter in a Northeastern U.S. acute care hospital. *Am. J. Infect. Control* 33 : e55–e56.

De Campos, P.A., Royer, S., da Fonseca Batistão, D.W., Araújo, B.F., Queiroz, L.L., de Brito, C.S., *et al.* (2016). Multidrug Resistance Related to Biofilm

- Formation in *Acinetobacter baumannii* and *Klebsiella pneumoniae* Clinical Strains from Different Pulsotypes. *Curr. Microbiol.* 72 : 617–627.
- De Oliveira, A., Pereira, V.C., Pinheiro, L., Riboli, D.F.M., Martins, K.B., & de Lourdes Ribeiro de Souza da Cunha, M. (2016). Antimicrobial resistance profile of planktonic and biofilm cells of *Staphylococcus aureus* and coagulase-negative staphylococci. *Int. J. Mol. Sci.* 17 : 1–12.
- De Souza, P.R., De Andrade, D., Cabral, D.B., & Watanabe, E. (2014). Endotracheal tube biofilm and ventilator-associated pneumonia with mechanical ventilation. *Microsc. Res. Tech.* 77 : 305–312.
- Deorukhkar, S. (2016). Catheter Associated Urinary Tract Candida Infections in Intensive Care Unit Patients. *J. Clin. Microbiol. Biochem. Technol.* 2 : 015–017.
- Di Domenico, E.G., Oliva, A., & Guembe, M. (2022). The Current Knowledge on the Pathogenesis of Tissue and Medical Device-Related Biofilm Infections. *Microorganisms* 10.
- Dijkshoorn, L., Nemec, A., & Seifert, H. (2007). An increasing threat in hospitals: Multidrug-resistant *Acinetobacter baumannii*. *Nat. Rev. Microbiol.* 5 : 939–951.
- Divakar, S., Lama, M., & Asad U., K. (2019). Antibiotics versus biofilm: an emerging battleground in microbial communities. *Antimicrob. Resist. Infect. Control* 8 : 76.
- Djeribi, R., Bouchloukh, W., Jouenne, T., & Menaa, B. (2012). Characterization of bacterial biofilms formed on urinary catheters. *Am. J. Infect. Control* 40 : 854–

859.

Donlan, R.M. (2002). Biofilms: Microbial Life on Surfaces. *Emerg. Infect. Dis.* 8.

Donlan, R.M. (2001). Biofilm Formation: A Clinically Relevant Microbiological Process, Clinical Infectious Diseases.

Dudeck, M.A., Edwards, J.R., Allen-Bridson, K., Gross, C., Malpiedi, P.J., Peterson, K.D., *et al.* (2015). National healthcare safety network report, data summary for 2013, device-associated module. *Am. J. Infect. Control* 43 : 206–221.

El-hamid, M.I.A., Toka, M., Hegazy, W.A.H., El-Naenaeey, E.-S.Y., Mosbah, R.A., & Nassar, M.S. (2020). Promising Antibiofilm Agents: Recent Breakthrough against Biofilm Producing Methicillin-Resistant *Staphylococcus aureus*. *Antibi* 9.

El Abed, S., Ibnsouda, S.K., Latrache, H., & Hamadi, F. (2016). Scanning Electron Microscopy (SEM) and Environmental SEM: Suitable Tools for Study of Adhesion Stage and Biofilm Formation Soumya. *Intechopen*.

Fahy, S., O'Connor, J.A., Lucey, B., & Sleator, R.D. (2023). Hospital Reservoirs of Multidrug Resistant *Acinetobacter* Species—The Elephant in the Room! *Br. J. Biomed. Sci.* 80 : 1–7.

Flores-mireles, A., Hreha, T.N., & Hunstad, D.A. (2019). Pathophysiology, Treatment, and Prevention of Catheter-Associated Urinary Tract Infection. *Top Spinal Cord Inj Rehabil* 25 : 228–240.

Flores-Mireles, A.L., Walker, J.N., Caparon, M., & Hultgren, S.J. (2015). Urinary tract infections: Epidemiology, mechanisms of infection and treatment

options. *Nat. Rev. Microbiol.* 13 : 269–284.

Foxman, B. (2010). The epidemiology of urinary tract infection. *Nat. Rev. Urol.* 7 : 653–660.

Gajdács, M., Baráth, Z., Kárpáti, K., Szabó, D., Usai, D., Zanetti, S., *et al.* (2021).

No correlation between biofilm formation, virulence factors, and antibiotic resistance in *pseudomonas aeruginosa*: Results from a laboratory-based in vitro study. *Antibiotics* 10 : 1–16.

Gajdács, M., Dóczi, I., Ábrók, M., Lázár, A., & Burián, K. (2019). Epidemiology of candiduria and *Candida* urinary tract infections in inpatients and outpatients: Results from a 10-year retrospective survey. *Cent. Eur. J. Urol.* 72 : 209–214.

Galié, S., García-Gutiérrez, C., Miguélez, E.M., Villar, C.J., & Lombó, F. (2018). Biofilms in the food industry: Health aspects and control methods. *Front. Microbiol.* 9 : 1–18.

Gallant, C. V., Daniels, C., Leung, J.M., Ghosh, A.S., Young, K.D., Kotra, L.P., *et al.* (2005). Common β -lactamases inhibit bacterial biofilm formation. *Mol. Microbiol.* 58 : 1012–1024.

Gould, C., Umscheid, C.A., Agarwal, R., Kuntz, G., Pegues, D.A., & HICPAC (2019). Guidelines for prevention of catheter-associated urinary tract infections 2009. *Healthc. Infect. Control Pract. Advis. Committe.*

Govindarajan, D.K., & Kandaswamy, K. (2022). Virulence factors of uropathogens and their role in host pathogen interactions. *Cell Surf.* 8 : 100075.

Guliciuc, M., Porav-Hodade, D., Mihailov, R., Rebegea, L.F., Voidazan, S.T.,

- Ghirca, V.M., *et al.* (2023). Exploring the Dynamic Role of Bacterial Etiology in Complicated Urinary Tract Infections. *Med.* 59 : 1–12.
- Gunardi, W.D., Karuniawati, A., Umbas, R., Bardosono, S., Lydia, A., Soebandrio, A., *et al.* (2021). Biofilm-Producing Bacteria and Risk Factors (Gender and Duration of Catheterization) Characterized as Catheter-Associated Biofilm Formation. *Int. J. Microbiol.* 2021.
- Hollenbeak, C.S., & Schilling, A.L. (2018). The attributable cost of catheter-associated urinary tract infections in the United States: A systematic review. *Am. J. Infect. Control* 46 : 751–757.
- Hooton, T.M. (2014). Nosocomial Urinary Tract Infections, Eighth Edi. ed, Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. Elsevier Inc.
- Hooton, Thomas M, Bradley, S.F., Cardenas, D.D., Colgan, R., Geerlings, S.E., Rice, J.C., *et al.* (2010). Diagnosis , Prevention , and Treatment of Catheter-Associated Urinary Tract Infection in Adults : 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clin. Infect. Dis.* 50 : 625–663.
- Jain, M., Dogra, V., Mishra, B., Thakur, A., Loomba, P.S., & Bhargava, A. (2011). Candiduria in catheterized intensive care unit patients: emerging microbiological trends. *Indian J. Pathol. Microbiol.* 54 : 552–555.
- Jain, S., Khatri, S., Kumar, M., Bharara, T., & Yadav, A. (2024). Identification and Antifungal Susceptibility Pattern of Candida Isolates Recovered from Urine and Blood Specimens from Patients Admitted in Wards of a Tertiary Care

Hospital, North Delhi. *J. Epidemiol. Public Heal.* 9 : 216–226.

Kaistha, S.D. (2018). Multiple antibiotic resistance and biofilm formation of catheter associated urinary tract infection (CAUTI) causing microorganisms.

J. Bacteriol. Mycol. Open Access 6 : 217–221.

Karuniawati, A., Gunardi, W.D., Anggraini, D., Santosaningsih, D., Saptawati, L., Cahyarini, *et al.* (2024). Pola Patogen dan Antibiogram di Indonesia Tahun 2023. Jakarta : PAMKI.

Kauffman, C.A. (2005). Candiduria. *Clin. Infect. Dis.* 41 : S371–S376.

Kauffman, C.A., Fisher, J.F., Sobel, J.D., & Newman, C.A. (2011). Candida urinary tract infections - Diagnosis. *Clin. Infect. Dis.* 52.

Kelly, T., Ai, C.E., Jung, M., & Yu, K. (2024). Catheter-associated urinary tract infections (CAUTIs) and non-CAUTI hospital-onset urinary tract infections: Relative burden, cost, outcomes and related hospital-onset bacteremia and fungemia infections. *Infect. Control Hosp. Epidemiol.* 864–871.

Kementrian Kesehatan Republik Indonesia (2016). Profil Kesehatan Indonesia 2015, Revista CENIC. Ciencias Biológicas. Jakarta : Kementerian Kesehatan Republik Indonesia.

Khabipova, N., Valeeva, L., Shaidullina, E., Kabanov, D., Vorobev, V., Gimadeev, Z., *et al.* (2023). Antibiotic Resistance of Biofilm-Related Catheter-Associated Urinary Tract Isolates of *Pseudomonas aeruginosa*. *Bionanoscience* 13 : 1012–1021.

Kitagawa, K., Shigemura, K., Yamamichi, F., Alimsardjono, L., Rahardjo, D., Kuntaman, K., *et al.* (2018). International comparison of causative bacteria

- and antimicrobial susceptibilities of urinary tract infections between Kobe, Japan, and Surabaya, Indonesia. *Jpn. J. Infect. Dis.* 71 : 8–13.
- Kırmusaoğlu, S. (2019). The Methods for Detection of Biofilm and Screening Antibiofilm Activity of Agents. *Antimicrob. Antibiot. Resist. Antibiofilm Strateg. Act. Methods.*
- Lee, K.H., Park, S.J., Choi, S.J., Uh, Y., Park, J.Y., & Han, K.H. (2017). The influence of urinary catheter materials on forming biofilms of microorganisms. *J. Bacteriol. Virol.* 47 : 32–40.
- Ling, M.L., Apisarnthanarak, A., & Madriaga, G. (2015). The burden of healthcare-associated infections in southeast Asia: A systematic literature review and meta-analysis. *Clin. Infect. Dis.* 60 : 1690–1699.
- Ling, M.L., Ching, P., Apisamthanarak, A., Jaggi, N., Harrington, G., & Fong, S.M. (2022). Apsic Guide For Prevention Of Catheter Associated Urinary Tract. *Asia Pasific Soc. Infect. Control* 1–47.
- Magiorakos, A., Srinivasan, A., Carey, R.B., Carmeli, Y., Falagas, M.E., Giske, C.G., *et al.* (2011). Bacteria : an International Expert Proposal for Interim Standard Definitions for Acquired Resistance.
- Mah, T. (2012). Biofilm-specific antibiotic resistance 1061–1072.
- Mahon, C.R., & Lehman, D. c. (2023). Textbook of Diagnostic Microbiology, Seventh ed. ed. St. Louis : Elsevier Inc.
- Malinovská, Z., Čonková, E., & Váczi, P. (2023). Biofilm Formation in Medically Important Candida Species. *J. Fungi* 9.
- Mancuso, G., Midiri, A., Gerace, E., Marra, M., Zummo, S., & Biondo, C. (2023).

Urinary Tract Infections: The Current Scenario and Future Prospects.

Pathogens 12.

Megged, O. (2022). Coagulase-negative Staphylococci: a rare cause of urinary tract infections in children with consequences on clinical practice. *Eur. J. Pediatr.* 181 : 1099–1104.

Mirghani, R., Saba, T., Khaliq, H., Mitchell, J., Do, L., Chambi, L., *et al.* (2022). Biofilms: Formation, drug resistance and alternatives to conventional approaches. *AIMS Microbiol.* 8 : 240–278.

Mittal, S., Sharma, M., & Chaudhary, U. (2015). Biofilm and multidrug resistance in uropathogenic *Escherichia coli*. *Pathog. Glob. Health* 109 : 26–29.

Mlugu, E.M., Mohamedi, J.A., Sangeda, R.Z., & Mwambete, K.D. (2023). Prevalence of urinary tract infection and antimicrobial resistance patterns of uropathogens with biofilm forming capacity among outpatients in morogoro, Tanzania: a cross-sectional study. *BMC Infect. Dis.* 23 : 1–9.

Mohamed, A.H., Omar, N.M.S., Osman, M.M., Mohamud, H.A., Eraslan, A., & Gur, M. (2022). Antimicrobial Resistance and Predisposing Factors Associated with Catheter-Associated UTI Caused by Uropathogens Exhibiting Multidrug-Resistant Patterns: A 3-Year Retrospective Study at a Tertiary Hospital in Mogadishu, Somalia. *Trop. Med. Infect. Dis.* 7 : 1–9.

Mota, É.C., & Oliveira, A.C. (2019). Catheter-associated urinary tract infection: Why do not we control this adverse event? *Rev. da Esc. Enferm.* 53 : 1–7.

Muhammad, M.H., Idris, A.L., Fan, X., Guo, Y., Yu, Y., Jin, X., *et al.* (2020). Beyond Risk: Bacterial Biofilms and Their Regulating Approaches. *Front.*

Microbiol. 11 : 1–20.

Murugesan, R.C., Subbiah, G., Lansingh, G.P., & Santhanakumarasamy, P. (2024).

Catheter - associated urinary tract infection and biofilms : Dreaded duo in health settings 1–6.

Nacey, J.N., Tulloch, A.G.S., & Ferguson, A.F. (1985). Catheter-induced

Urethritis: a Comparison Between Latex and Silicone Catheters in a Prospective Clinical Trial. *Br. J. Urol.* 57 : 325–328.

Nicolle, L.E. (2014). Infections associated with urinary catheters. *Nicolle*

Antimicrob. Resist. Infect. Control 722–727.

Nicolle, L.E., Bradley, S., Colgan, R., Rice, J.C., Schaeffer, A., & Hooton, T.M.

(2005). Erratum: Infectious diseases society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults (Clinical Infections Diseases (2005) 40 (643-654)). *Clin. Infect. Dis.* 40 : 1556.

Nirwati, H., Sinanjung, K., Fahrurissa, F., Wijaya, F., Napitupulu, S., Hati, V.P.,

et al. (2019). Biofilm formation and antibiotic resistance of *Klebsiella pneumoniae* isolated from clinical samples in a tertiary care hospital, Klaten, Indonesia. *BMC Proc.* 13 : 1–8.

Nuryastuti, T. (2014). Current in vitro assay to determine bacterial biofilm

formation of clinical isolates. *J. the Med. Sci. (Berkala Ilmu Kedokteran)* 46 : 142–152.

Nye, T.M., Zou, Z., Obernuefemann, C.L.P., Pinkner, J.S., Lowry, E.,

Kleinschmidt, K., *et al.* (2024). Microbial co-occurrences on catheters from long-term catheterized patients. *Nat. Commun.* 15 : 1–13.

- O'Toole, G.A. (2010). Microtiter dish Biofilm formation assay. *J. Vis. Exp.* 3–5.
- Obaid, N.A., Almarzoky Abuhussain, S., Mulibari, K.K., Alshanqiti, F., Malibari, S.A., Althobaiti, S.S., *et al.* (2023). Antimicrobial-resistant pathogens related to catheter-associated urinary tract infections in intensive care units: A multi-center retrospective study in the Western region of Saudi Arabia. *Clin. Epidemiol. Glob. Heal.* 21 : 101291.
- Pappas, P.G., Kauffman, C.A., Andes, D.R., Clancy, C.J., Marr, K.A., Ostrosky-Zeichner, L., *et al.* (2015). Clinical Practice Guideline for the Management of Candidiasis: 2016 Update by the Infectious Diseases Society of America. *Clin. Infect. Dis.* 62 : e1–e50.
- Patel, P.K., Advani, S.D., Kofman, A.D., Lo, E., Maragakis, L.L., Pegues, D.A., *et al.* (2023). Strategies to prevent catheter-associated urinary tract infections in acute-care hospitals: 2022 Update. *Infect. Control Hosp. Epidemiol.* 44 : 1209–1231.
- Pelling, H., Nzakizwanayo, J., Milo, S., Denham, E.L., MacFarlane, W.M., Bock, L.J., *et al.* (2019). Bacterial biofilm formation on indwelling urethral catheters. *Lett. Appl. Microbiol.* 68 : 277–293.
- Peng, D., Li, X., Liu, P., Luo, M., Chen, S., Su, K., *et al.* (2018). Epidemiology of pathogens and antimicrobial resistance of catheter-associated urinary tract infections in intensive care units: A systematic review and meta-analysis. *Am. J. Infect. Control* 46 : e81–e90.
- Qi, L., Li, H., Zhang, C., Liang, B., Li, J., Wang, L., *et al.* (2016). Relationship between antibiotic resistance, biofilm formation, and biofilm-specific

resistance in *Acinetobacter baumannii*. *Front. Microbiol.* 7 : 1–10.

Rajaramon, S., Shanmugam, K., Dandela, R., & Solomon, A.P. (2023). Emerging evidence-based innovative approaches to control catheter-associated urinary tract infection: a review. *Front. Cell. Infect. Microbiol.* 13 : 1–22.

Ramadan, R., Omar, N., Dawaba, M., & Moemen, D. (2021). Bacterial biofilm dependent catheter associated urinary tract infections: Characterization, antibiotic resistance pattern and risk factors. *Egypt. J. Basic Appl. Sci.* 8 : 64–74.

Relucenti, M., Familiari, G., Donfrancesco, O., Taurino, M., Li, X., Chen, R., *et al.* (2021). Microscopy methods for biofilm imaging: Focus on sem and VP-SEM pros and cons. *Biology (Basel)*. 10 : 1–17.

Rishpana, M.S., & Kabbin, J.S. (2015). Candiduria in catheter associated urinary tract infection with special reference to biofilm production. *J. Clin. Diagnostic Res.* 9 : DC11–DC13.

Roberts, M.E., & Stewart, P.S. (2004). Modeling Antibiotic Tolerance in Biofilms by Accounting for Nutrient Limitation. *Antimicrob. Agents Chemother.* 48 : 48–52.

Römling, U., & Balsalobre, C. (2012). Biofilm infections, their resilience to therapy and innovative treatment strategies. *J. Intern. Med.* 272 : 541–561.

S.A, K., M.O, R., & M.H, R. (2020). Phenotypic and Genotypic Detection Of Efflux Pump Mediated Meropenem Resistance in *Pseudomonas aeruginosa* Isolates From Catheter Associated Urinary Tract Infection. *Egypt. J. Med. Microbiol.* 29 : 2537–0979.

Sabir, N., Ikram, A., Zaman, G., Satti, L., Gardezi, A., Ahmed, A., *et al.* (2017).

Bacterial biofilm-based catheter-associated urinary tract infections: Causative pathogens and antibiotic resistance. *Am. J. Infect. Control* 45 : 1101–1105.

Saint, S. (2000). Clinical and economic consequences of nosocomial catheter-related bacteriuria. *Am. J. Infect. Control* 28 : 68–75.

Salman, N.A.M., Mohamed, M.F., Abu Elwafa, W.A., & Goda, A.M. (2023).

Isolation of Gram-Negative Organisms Causing Nosocomial Catheter Associated Urinary Tract Infection and Detection of Fosfomycin Effect on Multi-Drug Resistant Strains in Sohag University Hospital. *Egypt. J. Med. Microbiol.* 32 : 99–108.

Schaudinn, C., Stoodley, P., Kainović, A., O’Keeffe, T., Costerton, B., Robinson, D., *et al.* (2007). Bacterial biofilms, other structures seen as mainstream concepts. *Microbe* 2 : 231–237.

Scott II, R.D. (2009). The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention.

Scruggs-Wodkowski, E., Kidder, I., Meddings, J., & Patel, P.K. (2024). Urinary Catheter-Associated Infections. *Infect. Dis. Clin. North Am.* 38 : 713–729.

Shadkam, S., Goli, H.R., Mirzaei, B., Gholami, M., & Ahanjan, M. (2021). Correlation between antimicrobial resistance and biofilm formation capability among *Klebsiella pneumoniae* strains isolated from hospitalized patients in Iran. *Ann. Clin. Microbiol. Antimicrob.* 20 : 1–7.

Shahriar, A., Faijanur, M., Siddiquee, R., Ahmed, H., Mahmud, A.R., Ahmed, T., *et al.* (2022). Catheter-associated urinary tract infections : Etiological analysis

, biofilm formation , antibiotic resistance , and a novel therapeutic era of phage.

Sharma, S., Mohler, J., Mahajan, S.D., Schwartz, S.A., Bruggemann, L., &

Aalinkeel, R. (2023). Microbial Biofilm: A Review on Formation, Infection, Antibiotic Resistance, Control Measures, and Innovative Treatment, Microorganisms.

Shirtliff, M., Leid, J.G., & Costerton, W.J. (2009). The Role of Biofilms in Device-Related Infections, The Role of Biofilms in Device-Related Infections. Berlin : Springer-Verlag Berlin Heidelberg.

Silva, A., Silva, V., López, M., Rojo-Bezares, B., Carvalho, J.A., Castro, A.P., *et al.* (2023). Antimicrobial Resistance, Genetic Lineages, and Biofilm Formation in *Pseudomonas aeruginosa* Isolated from Human Infections: An Emerging One Health Concern. *Antibiotics* 12 : 1–12.

Singhal, E., Singh, R., Bhardwaj, P., & Kumari, M. (2024). Candida species in catheter associated urinary tract infection in ICU patients at a tertiary care hospital in North India: An observational study. *J. Med. Sci. Res.* 12 : 11–15.

Sobel, J.D., Fisher, J.F., Kauffman, C.A., & Newman, C.A. (2011). Candida urinary tract infections - Epidemiology. *Clin. Infect. Dis.* 52 : 433–436.

Stepanovic, S., Vukovic, D., Hola, V., Bonaventura, G. DI, Djukic, S., Ruzicka, F., *et al.* (2007). Quantification of biofilm in microtiter plates: overview of testing conditions and practical recommendations for assessment of biofilm production by staphylococci. *APMIS* 891 : 891–900.

Stickler, D.J. (2008). Bacterial biofilms in patients with indwelling urinary catheters. *Nat. Clin. Pract. Urol.* 5 : 598–608.

Stoodley, P., Hall-Stoodley, L., Costerton, B., DeMeo, P., Shirtliff, M., Gawalt, E.,
et al. (2013). Biofilms, Biomaterials, and Device-Related Infections,
Handbook of Polymer Applications in Medicine and Medical Devices.
Elsevier Inc.

Storme, O., Saucedo, J.T., Garcia-mora, A., Dehesa-Davila, M., & Naber, kurt G.
(2019). Risk factors and predisposing conditions for urinary tract infection.
Ther. Adv. Urol. 11 : 19–28.

Suryawati, B., Aman, A.T., & Nuryastuti, T. (2023). Studi Bakteri Penyebab Isk
Pada Pasien Dengan Kateter Urin Di Rsud Dr. Moewardi Surakarta: Jenis
Bakteri, Kepekaan Antibiotik, Kemampuan Membentuk Biofilm Dan
Identifikasi Gen Adhesin. Universitas Gadjah Mada.

Trautner, Barbara W, & Darouiche, R.O. (2004). Role of biofilm in catheter-
associated urinary tract infection. *AJIC Am. J. Infect. Control* 23 : 177–183.

Trautner, Barbara W., & Darouiche, R.O. (2004). Catheter-Associated Infections.
Arch Intern Med 164 : 842–850.

Tsai, C.T., Lai, C.-H., Chiu, C.-T., Hsu, C.-K., Liang, S.-Y., & Kuo, Y.L. (2024).
Validity of Urinary Catheter Specimens for Diagnosis of Urinary Tract
Infection in Patients with Short-Term Catheterization. *Diagn. Microbiol.*
Infect. Dis. 110 : 116536.

Vysakh, A., Midhun, S.J., Jayesh, K., Jyothis, M., & Latha, M.S. (2018). Studies
on biofilm formation and virulence factors associated with uropathogenic
Escherichia coli isolated from patient with acute pyelonephritis.
Pathophysiology 25 : 381–387.

- Wang, S., Zhang, Y., Zhang, X., & Li, J. (2020). An evaluation of multidrug-resistant (MDR) bacteria in patients with urinary stone disease: data from a high-volume stone management center. *World J. Urol.* 38 : 425–432.
- Werneburg, Glenn T (2022). Catheter-Associated Urinary Tract Infections : Current Challenges and Future Prospects. *Res. Reports Urol.* 14 : 109–133.
- Werneburg, G.T., Nguyen, A., Henderson, N.S., Raymond, R., Shoskes, D.A., Sueur, A.L. Le, *et al.* (2021). The natural history and composition of urinary catheter biofilms: early uropathogen colonization with intraluminal and distal predominance. *J Urol* 203 : 357–364.
- WHO (2024). WHO bacterial priority pathogens list, 2024, Bacterial pathogens of public health importance to guide research, development and strategies to prevent and control antimicrobial resistance.
- Yang, X., Chen, H., Zheng, Y., Qu, S., Wang, H., & Yi, F. (2022). Disease burden and long-term trends of urinary tract infections: A worldwide report. *Front. Public Heal.* 10.
- Zeng, Z., Zhan, J., Zhang, K., Chen, H., & Cheng, S. (2022). Global, regional, and national burden of urinary tract infections from 1990 to 2019: an analysis of the global burden of disease study 2019. *World J. Urol.* 40 : 755–763.