



MICROBIOLOGY

Year 2 — Bachelor of Dental Surgery (BDS)
Reference & Resource List · Chapters 1–13

Disclaimer

Questions in this bank were generated with the assistance of artificial intelligence and reviewed against the references listed. They are provided for educational revision only, are not a substitute for prescribed textbooks, clinical guidelines or supervised clinical training, and no warranty is given as to their accuracy or completeness.

This list supports the MCQ, SBA, SAQ and flashcard question banks for Microbiology (Year 2 BDS). It is organised in two parts:

- Part 1 — Core references: the standard texts, guidelines and resources that underpin every chapter (1–13). Cite these once on the subject landing page; there is no need to repeat them chapter by chapter.
- Part 2 — Chapter-specific references: the exact chapter mapping within the core texts, plus additional targeted sources unique to that topic.

PART 1 — CORE REFERENCES (Chapters 1–13)

1.1 Primary microbiology textbooks

These texts between them cover the entire Year 2 Microbiology syllabus. Students in different programmes will be prescribed different ones, so the main options are included.

1. Riedel S, Morse SA, editors. Jawetz, Melnick & Adelberg's Medical Microbiology. 29th ed. New York: McGraw Hill; 2025. — *the international reference standard; bacteriology, virology, mycology, parasitology and immunology in one volume*
2. Murray PR, Rosenthal KS, Pfaller MA. Medical Microbiology. 9th ed. Philadelphia: Elsevier; 2021. — *strongly mechanism- and summary-table based; excellent for SBA writing*
3. Barer MR, Irving WL, Swann A, Perera N, editors. Medical Microbiology: A Guide to Microbial Infections. 19th ed. Edinburgh: Elsevier; 2018. — *organised by organism and by clinical syndrome*
4. Saxena S, editor. Ananthanarayan and Paniker's Textbook of Microbiology. 13th ed. Hyderabad: Universities Press; 2024. — *long-established undergraduate text written for MBBS and BDS courses*
5. Sastry AS, Bhat S. Essentials of Medical Microbiology. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023. — *heavily illustrated, flowchart-driven; useful for flashcard content*
6. Levinson W, Chin-Hong P, Joyce EA, Nussbaum J, Schwartz B. Review of Medical Microbiology and Immunology: A Guide to Clinical Infectious Diseases. 18th ed. New York: McGraw Hill; 2024. — *concise revision-style text with extensive self-assessment*

7. Ryan KJ, editor. Sherris & Ryan's Medical Microbiology: An Introduction to Infectious Diseases. 8th ed. New York: McGraw Hill; 2022. — *clear treatment of pathogenesis and host response*
8. Willey JM, Sandman KM, Wood DH. Prescott's Microbiology. 12th ed. New York: McGraw Hill; 2023. — *general microbiology depth for growth, nutrition and genetics (Chapters 3 and 4)*

1.2 Dental and oral microbiology texts

Used throughout to establish the dental relevance of each general microbiology concept — essential for a BDS-specific question bank, and the primary sources for Chapters 5, 6, 7 and 9.

9. Samaranayake L. Samaranayake's Essential Microbiology for Dentistry. 6th ed. Edinburgh: Elsevier; 2024. — *the single most closely aligned text to this syllabus; structured as General Microbiology, Basic Immunology, Microbes of Relevance to Dentistry, and Infections of Relevance to Dentistry*
10. Lewis MAO, Marsh PD, Rogers H, Williams D, Wilson M. Marsh and Martin's Oral Microbiology. 7th ed. Edinburgh: Elsevier; 2026. — *the standard reference for oral microbial ecology, plaque biofilms and orofacial infection*
11. Lamont RJ, Hajishengallis GN, Koo H, Jenkinson HF, editors. Oral Microbiology and Immunology. 3rd ed. Washington DC: ASM Press; 2019. — *mechanism-level treatment of the oral microbiome and host response*
12. Bagg J, MacFarlane TW, Poxton IR, Smith AJ. Essentials of Microbiology for Dental Students. 2nd ed. Oxford: Oxford University Press; 2006. — *concise classic still in wide undergraduate use*
13. Odell EW. Cawson's Essentials of Oral Pathology and Oral Medicine. 10th ed. Edinburgh: Elsevier; 2024. — *clinical correlation for oral infections and their presentation*
14. Chapple ILC, Papapanou PN, editors. Periodontitis: Understanding a Complex Disease. Cham: Springer; 2024. — *contemporary account of periodontal microbiology and dysbiosis*

1.3 Supporting texts — immunology, infection and clinical context

15. Abbas AK, Lichtman AH, Pillai S. Basic Immunology: Functions and Disorders of the Immune System. 7th ed. Philadelphia: Elsevier; 2024. — *for host defence content in Chapter 6*
16. Delves PJ, Martin SJ, Burton DR, Roitt IM. Roitt's Essential Immunology. 13th ed. Oxford: Wiley-Blackwell; 2017.
17. Bennett JE, Dolin R, Blaser MJ, editors. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Philadelphia: Elsevier; 2020. — *reference-level organism and syndrome detail for Chapter 8*
18. Howley PM, Knipe DM, editors. Fields Virology. 7th ed. Philadelphia: Wolters Kluwer; 2021. — *reference-level virology for Chapter 10*
19. Scully C. Scully's Medical Problems in Dentistry. 7th ed. Edinburgh: Elsevier; 2014. — *systemic infection and its dental implications*
20. Ralston SH, Penman ID, Strachan MWJ, Hobson RP, editors. Davidson's Principles and Practice of Medicine. 24th ed. Edinburgh: Elsevier; 2022. — *clinical presentation of the systemic infections referenced in Chapters 8, 10 and 12*

1.4 Guidelines and official body publications

Cited by chapter in Part 2. All are freely accessible from the issuing body.

21. National Institute for Health and Care Excellence. Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use. NICE guideline NG15. London: NICE; 2015. Available from: <https://www.nice.org.uk/guidance/ng15>

22. National Institute for Health and Care Excellence. Prophylaxis against infective endocarditis. Clinical guideline CG64. London: NICE; 2008 (updated 2016). Available from: <https://www.nice.org.uk/guidance/cg64>
23. Scottish Dental Clinical Effectiveness Programme. Drug Prescribing for Dentistry: Dental Clinical Guidance. 3rd ed. Dundee: SDCEP; 2016. Available from: <https://www.sdcep.org.uk>
24. Department of Health. Health Technical Memorandum 01-05: Decontamination in primary care dental practices. London: Department of Health; 2013. Available from: <https://www.gov.uk>
25. Centers for Disease Control and Prevention. Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care. Atlanta: CDC; 2016. Available from: <https://www.cdc.gov>
26. Rutala WA, Weber DJ; Healthcare Infection Control Practices Advisory Committee. Guideline for Disinfection and Sterilization in Healthcare Facilities. Atlanta: CDC; 2008 (updated 2019). Available from: <https://www.cdc.gov>
27. World Health Organization. Guidelines on Hand Hygiene in Health Care. Geneva: WHO; 2009. Available from: <https://www.who.int>
28. World Health Organization. Decontamination and Reprocessing of Medical Devices for Health-Care Facilities. Geneva: WHO; 2016.
29. World Health Organization. WHO Bacterial Priority Pathogens List, 2024: bacterial pathogens of public health importance to guide research, development and strategies to prevent and control antimicrobial resistance. Geneva: WHO; 2024.
30. World Health Organization. The WHO AWaRe (Access, Watch, Reserve) Antibiotic Book. Geneva: WHO; 2022.
31. World Health Organization. WHO Fungal Priority Pathogens List to Guide Research, Development and Public Health Action. Geneva: WHO; 2022.
32. UK Health Security Agency. UK Standards for Microbiology Investigations (UK SMI). Available from: <https://www.gov.uk/government/collections/standards-for-microbiology-investigations-smi> — *specimen collection, staining, culture and identification protocols*
33. European Committee on Antimicrobial Susceptibility Testing. Breakpoint tables for interpretation of MICs and zone diameters. Available from: <https://www.eucast.org>
34. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing. Wayne (PA): CLSI. Available from: <https://clsi.org>
35. Royal College of Surgeons of England, Faculty of Dental Surgery. Clinical guidelines and standards. London: RCS England. Available from: <https://www.rcseng.ac.uk>

1.5 Open-access and citable online reference sources

36. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430685/> — *free, peer-reviewed and citable*
37. Chen T, Yu WH, Izard J, Baranova OV, Lakshmanan A, Dewhirst FE. The Human Oral Microbiome Database: a web accessible resource for investigating oral microbe taxonomic and genomic information. Database (Oxford). 2010;2010:baq013. Available from: <https://www.homd.org>
38. Parte AC, Sardà Carbasse J, Meier-Kolthoff JP, Reimer LC, Göker M. List of Prokaryotic names with Standing in Nomenclature (LPSN) moves to the DSMZ. Int J Syst Evol Microbiol. 2020;70(11):5607–5612. Available from: <https://lpsn.dsmz.de> — *authoritative bacterial nomenclature*
39. International Committee on Taxonomy of Viruses. Virus Taxonomy: current ICTV release. Available from: <https://ictv.global> — *authoritative virus nomenclature*

1.6 Key journals for currency

Clinical Microbiology Reviews · Nature Reviews Microbiology · Journal of Clinical Microbiology · Journal of Antimicrobial Chemotherapy · Journal of Hospital Infection · Journal of Dental Research · Journal of Oral Microbiology · Molecular Oral Microbiology · Journal of Clinical Periodontology · Periodontology 2000 · Caries Research · International Endodontic Journal · Journal of Endodontics · Oral Diseases · British Dental Journal · International Dental Journal

PART 2 — CHAPTER-SPECIFIC REFERENCES

Numbers in square brackets refer to the core list in Part 1. Sources listed under "Additional" are specific to that chapter. Chapter numbers given within a core text are indicative and should be checked against the edition held.

Chapter 1 — Introduction to Microbiology

1.1 Scope and branches (bacteriology, virology, mycology, parasitology; normal flora vs pathogens; opportunistic and nosocomial infection) · 1.2 Microbial classification and nomenclature (prokaryotes vs eukaryotes; viruses as obligate intracellular agents; genus, species and strain; sterile vs colonised sites) · 1.3 Host–microbe interaction (colonisation vs infection vs disease; virulence and pathogenicity; carrier states; biofilms)

Core reading: [1] Ch. 1–3 · [2] Ch. 1 · [4] Ch. 1 · [5] Section 1 · [7] Ch. 1 · [9] Ch. 1–2 · [10] Ch. 1 · [12] Ch. 1

Additional

- Casadevall A, Pirofski LA. Host-pathogen interactions: basic concepts of microbial commensalism, colonization, infection, and disease. *Infect Immun.* 2000;68(12):6511–6518. — *the definitive framework for the colonisation/infection/disease distinction in 1.3*
- Casadevall A, Pirofski LA. The damage-response framework of microbial pathogenesis. *Nat Rev Microbiol.* 2003;1(1):17–24.
- Human Microbiome Project Consortium. Structure, function and diversity of the healthy human microbiome. *Nature.* 2012;486(7402):207–214.
- Dewhirst FE, Chen T, Izard J, Paster BJ, Tanner ACR, Yu WH, et al. The human oral microbiome. *J Bacteriol.* 2010;192(19):5002–5017.
- Marchesi JR, Ravel J. The vocabulary of microbiome research: a proposal. *Microbiome.* 2015;3:31. — *precise use of microbiota, microbiome, flora and metagenome*
- Berg G, Rybakova D, Fischer D, Cernava T, Vergès MC, Charles T, et al. Microbiome definition re-visited: old concepts and new challenges. *Microbiome.* 2020;8(1):103.
- World Health Organization. Global Report on Infection Prevention and Control. Geneva: WHO; 2022. — *scale and definition of healthcare-associated infection for 1.1*
- Sartelli M, Bartoli S, Borghi F, Busani S, Cortese F, Coccolini F, et al. Nosocomial infections: a global perspective. *Antibiotics (Basel).* 2024;13(12):1112.
- Woese CR, Kandler O, Wheelis ML. Towards a natural system of organisms: proposal for the domains Archaea, Bacteria, and Eucarya. *Proc Natl Acad Sci USA.* 1990;87(12):4576–4579. — *the basis of the three-domain classification in 1.2*
- Parte AC, Sardà Carbasse J, Meier-Kolthoff JP, Reimer LC, Göker M. List of Prokaryotic names with Standing in Nomenclature (LPSN). *Int J Syst Evol Microbiol.* 2020;70(11):5607–5612. Available from: <https://lpsn.dsmz.de>
- International Committee on Taxonomy of Viruses. The new scope of virus taxonomy: partitioning the virosphere into 15 hierarchical ranks. *Nat Microbiol.* 2020;5(5):668–674. Available from: <https://ictv.global>

Chapter 2 — Microscopy and Staining

2.1 Microscopy (bright field, dark field, phase contrast, fluorescence) · 2.2 Staining techniques (simple, differential, Gram stain principle, steps, interpretation and errors; acid-fast/Ziehl–Neelsen staining and its significance for mycobacteria; spore, capsule and flagella stains; interpreting smear reports)

Core reading: [1] Ch. 2 · [2] Ch. 3 and Ch. 16 · [4] Ch. 2 · [5] Section 1 · [7] Ch. 4 · [9] Ch. 2 · [32] TP 39 and related staining protocols

Additional — microscopy

- Murphy DB, Davidson MW. Fundamentals of Light Microscopy and Electronic Imaging. 2nd ed. Hoboken: Wiley-Blackwell; 2012. — *resolution, numerical aperture, and the optical basis of each modality*
- Thorn K. A quick guide to light microscopy in cell biology. Mol Biol Cell. 2016;27(2):219–222.
- Steingart KR, Henry M, Ng V, Hopewell PC, Ramsay A, Cunningham J, et al. Fluorescence versus conventional sputum smear microscopy for tuberculosis: a systematic review. Lancet Infect Dis. 2006;6(9):570–581. — *evidence base for fluorescence microscopy in 2.1*

Additional — staining

- Beveridge TJ. Use of the Gram stain in microbiology. Biotech Histochem. 2001;76(3):111–118. — *why the stain works, and the wall ultrastructure behind it*
- Beveridge TJ, Davies JA. Cellular responses of Bacillus subtilis and Escherichia coli to the Gram stain. J Bacteriol. 1983;156(2):846–858.
- Coico R. Gram staining. Curr Protoc Microbiol. 2005;Appendix 3:Appendix 3C.
- Tripathi N, Sapra A. Gram Staining. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK562156/>
- World Health Organization. Laboratory Services in Tuberculosis Control, Part II: Microscopy. Geneva: WHO. — *Ziehl–Neelsen method, reading and reporting conventions*
- World Health Organization. WHO Consolidated Guidelines on Tuberculosis, Module 3: Diagnosis — *Rapid Diagnostics for Tuberculosis Detection*. Geneva: WHO; 2021.
- Hendrickson DA, Krenz MM. Reagents and stains. In: Manual of Clinical Microbiology. Washington DC: ASM Press. — *reference formulations for spore, capsule and flagella stains*
- UK Health Security Agency. UK Standards for Microbiology Investigations: Bacteriology — *staining procedures and interpretation of smears*. Available from: <https://www.gov.uk/government/collections/standards-for-microbiology-investigations-smi>

Chapter 3 — Bacterial Cell Structure and Function

3.1 Bacterial anatomy (cell wall; Gram-positive peptidoglycan and teichoic acids; Gram-negative outer membrane, LPS and porins; cell membrane; cytoplasm, 70S ribosomes and inclusions; nucleoid and plasmids) · 3.2 External structures (capsule and slime layer; flagella and motility; pili and fimbriae) · 3.3 Spore formation (Bacillus and Clostridium endospores; spore resistance and its sterilization implications)

Core reading: [1] Ch. 2 · [2] Ch. 2 · [4] Ch. 2 · [5] Section 1 · [8] Ch. 2–3 · [9] Ch. 2 · [10] Ch. 2 · [12] Ch. 2

Additional — cell envelope

- Silhavy TJ, Kahne D, Walker S. The bacterial cell envelope. Cold Spring Harb Perspect Biol. 2010;2(5):a000414. — *the single best overview for 3.1*
- Vollmer W, Blanot D, de Pedro MA. Peptidoglycan structure and architecture. FEMS Microbiol Rev. 2008;32(2):149–167.
- Brown S, Santa Maria JP Jr, Walker S. Wall teichoic acids of Gram-positive bacteria. Annu Rev Microbiol. 2013;67:313–336.
- Whitfield C, Trent MS. Biosynthesis and export of bacterial lipopolysaccharide. Annu Rev Biochem. 2014;83:99–128.
- Nikaido H. Molecular basis of bacterial outer membrane permeability revisited. Microbiol Mol Biol Rev. 2003;67(4):593–656. — *porins, permeability and its relevance to antimicrobial entry*
- Sun J, Rutherford ST, Silhavy TJ, Huang KC. Physical properties of the bacterial outer membrane. Nat Rev Microbiol. 2022;20(4):236–248.

Additional — external structures and cytoplasmic contents

- Berg HC. The rotary motor of bacterial flagella. *Annu Rev Biochem.* 2003;72:19–54.
- Nakamura S, Minamino T. Flagella-driven motility of bacteria. *Biomolecules.* 2019;9(7):279. — *monotrichous, lophotrichous, amphitrichous and peritrichous arrangements*
- Proft T, Baker EN. Pili in Gram-negative and Gram-positive bacteria: structure, assembly and their role in disease. *Cell Mol Life Sci.* 2009;66(4):613–635.
- Roberts IS. The biochemistry and genetics of capsular polysaccharide production in bacteria. *Annu Rev Microbiol.* 1996;50:285–315.
- Shively JM, editor. *Inclusions in Prokaryotes.* Berlin: Springer; 2006. — *cytoplasmic inclusions, storage granules and metachromatic volutin*
- Wang JD, Levin PA. Metabolism, cell growth and the bacterial cell cycle. *Nat Rev Microbiol.* 2009;7(11):822–827. — *nucleoid organisation and replication*

Additional — endospores

- Setlow P. Spores of *Bacillus subtilis*: their resistance to and killing by radiation, heat and chemicals. *J Appl Microbiol.* 2006;101(3):514–525. — *the mechanistic basis of the sterilization link in 3.3*
- Setlow P. Spore resistance properties. *Microbiol Spectr.* 2014;2(5):TBS-0003-2012.
- Talukdar PK, Olguín-Araneda V, Alnoman M, Paredes-Sabja D, Sarker MR. Updates on the sporulation process in *Clostridium* species. *Res Microbiol.* 2015;166(4):225–235.
- Tan IS, Ramamurthi KS. Spore formation in *Bacillus subtilis*. *Environ Microbiol Rep.* 2014;6(3):212–225.

Chapter 4 — Bacterial Growth, Nutrition and Genetics

4.1 Growth requirements (obligate aerobes and anaerobes, facultative anaerobes, microaerophiles; temperature, pH and osmotic needs) · 4.2 Growth curve and replication (lag, log, stationary and decline phases; binary fission) · 4.3 Culture media (basic, enriched, selective and differential media; blood, chocolate, MacConkey and Sabouraud agars; anaerobic culture) · 4.4 Bacterial genetics (mutation; transformation, transduction and conjugation; plasmids and antibiotic resistance; transposons)

Core reading: [1] Ch. 5–7 · [2] Ch. 2–3 · [4] Ch. 3–7 · [5] Section 1 · [8] Ch. 5–7 and Ch. 16 · [9] Ch. 3 · [12] Ch. 3

Additional — growth and nutrition

- Monod J. The growth of bacterial cultures. *Annu Rev Microbiol.* 1949;3:371–394. — *the original description of the growth curve and of continuous culture*
- Imlay JA. Cellular defenses against superoxide and hydrogen peroxide. *Annu Rev Biochem.* 2008;77:755–776. — *superoxide dismutase and catalase as the true basis of the aerotolerance classification in 4.1*
- Lu Z, Imlay JA. When anaerobes encounter oxygen: mechanisms of oxygen toxicity, tolerance and defence. *Nat Rev Microbiol.* 2021;19(12):774–785.
- Jaishankar J, Srivastava P. Molecular basis of stationary phase survival and applications. *Front Microbiol.* 2017;8:2000.
- Oliver JD. Recent findings on the viable but nonculturable state in pathogenic bacteria. *FEMS Microbiol Rev.* 2010;34(4):415–425. — *why colony counts and microscopic counts can diverge*
- Wood TK, Knabel SJ, Kwan BW. Bacterial persister cell formation and dormancy. *Appl Environ Microbiol.* 2013;79(23):7116–7121.

Additional — culture media and anaerobic culture

- Atlas RM. Handbook of Microbiological Media. 4th ed. Boca Raton: CRC Press; 2010. — *reference formulations and intended use of each medium*
- Sanders ER. Aseptic laboratory techniques: plating methods. J Vis Exp. 2012;(63):e3064.
- Wadsworth-KTL Anaerobic Bacteriology Manual. 6th ed. Belmont (CA): Star Publishing. — *anaerobic transport, culture and identification methods*
- UK Health Security Agency. UK Standards for Microbiology Investigations: culture media and their applications. Available from: <https://www.gov.uk/government/collections/standards-for-microbiology-investigations-smi>

Additional — bacterial genetics and horizontal gene transfer

- Griffith F. The significance of pneumococcal types. J Hyg (Lond). 1928;27(2):113–159. — *the original transformation experiment*
- Lederberg J, Tatum EL. Gene recombination in Escherichia coli. Nature. 1946;158:558. — *the discovery of conjugation*
- Zinder ND, Lederberg J. Genetic exchange in Salmonella. J Bacteriol. 1952;64(5):679–699. — *the discovery of transduction*
- Thomas CM, Nielsen KM. Mechanisms of, and barriers to, horizontal gene transfer between bacteria. Nat Rev Microbiol. 2005;3(9):711–721.
- von Wintersdorff CJH, Penders J, van Niekerk JM, Mills ND, Majumder S, van Alphen LB, et al. Dissemination of antimicrobial resistance in microbial ecosystems through horizontal gene transfer. Front Microbiol. 2016;7:173.
- Partridge SR, Kwong SM, Firth N, Jensen SO. Mobile genetic elements associated with antimicrobial resistance. Clin Microbiol Rev. 2018;31(4):e00088-17. — *plasmids, transposons, integrons and ICEs, with the distinctions the question bank turns on*
- Johnston C, Martin B, Fichant G, Polard P, Claverys JP. Bacterial transformation: distribution, shared mechanisms and divergent control. Nat Rev Microbiol. 2014;12(3):181–196.
- Roberts AP, Mullany P. Oral biofilms: a reservoir of transferable, bacterial, antimicrobial resistance. Expert Rev Anti Infect Ther. 2010;8(12):1441–1450. — *the dental relevance of gene transfer*
- Woodford N, Ellington MJ. The emergence of antibiotic resistance by mutation. Clin Microbiol Infect. 2007;13(1):5–18.

Chapter 5 — Sterilization, Disinfection and Infection Control

5.1 Definitions (sterilization vs disinfection vs antisepsis; decontamination; asepsis) · 5.2 Physical methods (moist heat and autoclave principles, cycle parameters and validation; dry heat; filtration; ultraviolet and gamma radiation) · 5.3 Chemical methods (alcohols, aldehydes, halogens, phenolics, chlorhexidine; oxidising agents; surface vs high-level disinfectants) · 5.4 Dental infection control (instrument processing workflow; chemical and biological indicators; hand hygiene, PPE and sharps safety; biomedical waste; post-exposure prophylaxis)

Core reading: [1] Ch. 5 · [2] Ch. 4 · [4] Ch. 3 · [5] Section 1 · [9] Ch. 36–38 · [10] Ch. 15 · [24] · [25] · [26] · [27] · [28]

Additional — principles and mechanisms

- Spaulding EH. Chemical disinfection of medical and surgical materials. In: Lawrence CA, Block SS, editors. Disinfection, Sterilization and Preservation. Philadelphia: Lea & Febiger; 1968. — *the critical/semi-critical/non-critical classification, best accessed through [26]*
- McDonnell G, Russell AD. Antiseptics and disinfectants: activity, action, and resistance. Clin Microbiol Rev. 1999;12(1):147–179. — *mechanism of action of every agent group in 5.3*

- Russell AD. Bacterial resistance to disinfectants: present knowledge and future problems. *J Hosp Infect.* 1999;43 Suppl:S57–S68.
- Maillard JY, Pascoe M. Disinfectants and antiseptics: mechanisms of action and resistance. *Nat Rev Microbiol.* 2024;22(1):4–17.
- Setlow P. Spores of *Bacillus subtilis*: their resistance to and killing by radiation, heat and chemicals. *J Appl Microbiol.* 2006;101(3):514–525. — *why spores define sterilization endpoints*

Additional — dental decontamination and infection control

- Department of Health. Health Technical Memorandum 01-05: Decontamination in primary care dental practices. London: Department of Health; 2013.
- NHS Scotland. Scottish Health Technical Memorandum 01-05: Decontamination in dental care facilities. Available from: <https://www.nss.nhs.scot>
- Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM. Guidelines for infection control in dental health-care settings — 2003. *MMWR Recomm Rep.* 2003;52(RR-17):1–61. — *the underlying evidence base for [25]*
- Centers for Disease Control and Prevention. Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care. Atlanta: CDC; 2016.
- Laheij AMGA, Kistler JO, Belibasakis GN, Välimaa H, de Soet JJ; European Oral Microbiology Workshop. Healthcare-associated viral and bacterial infections in dentistry. *J Oral Microbiol.* 2012;4:17659.
- World Health Organization. Guidelines on Hand Hygiene in Health Care. Geneva: WHO; 2009.
- World Health Organization. Safe Management of Wastes from Health-Care Activities. 2nd ed. Geneva: WHO; 2014.
- World Health Organization. Decontamination and Reprocessing of Medical Devices for Health-Care Facilities. Geneva: WHO; 2016.
- Kuhar DT, Henderson DK, Struble KA, Heneine W, Thomas V, Cheever LW, et al. Updated US Public Health Service guidelines for the management of occupational exposures to human immunodeficiency virus and recommendations for postexposure prophylaxis. *Infect Control Hosp Epidemiol.* 2013;34(9):875–892.
- British Standards Institution. BS EN 13060: Small steam sterilizers; BS EN 285: Sterilization — steam sterilizers. London: BSI. — *cycle parameters and validation referenced in 5.2*

Chapter 6 — Microbial Pathogenesis

6.1 Virulence factors (adhesins and colonisation factors; invasins and enzymes; exotoxins — cytotoxic, neurotoxic and enterotoxic; endotoxin/LPS, fever and shock) · 6.2 Biofilms (formation stages; quorum sensing; biofilm resistance to antimicrobials and host defences; dental plaque as a biofilm) · 6.3 Host defences (innate vs adaptive; inflammation; saliva and mucosal immunity)

Core reading: [1] Ch. 9 · [2] Ch. 6 and Ch. 8 · [4] Ch. 10 · [5] Section 1 · [9] Ch. 5 and Ch. 8–10 · [10] Ch. 5–7 · [11] · [15] Ch. 2–4

Additional — virulence factors and toxins

- Ribet D, Cossart P. How bacterial pathogens colonize their hosts and invade deeper tissues. *Microbes Infect.* 2015;17(3):173–183.
- Casadevall A, Pirofski LA. Virulence factors and their mechanisms of action: the view from a damage-response framework. *J Water Health.* 2009;7 Suppl 1:S2–S18.
- Raetz CRH, Whitfield C. Lipopolysaccharide endotoxins. *Annu Rev Biochem.* 2002;71:635–700.
- Park BS, Lee JO. Recognition of lipopolysaccharide pattern by TLR4 complexes. *Exp Mol Med.* 2013;45(12):e66. — *the TLR4/MD-2 mechanism behind fever and shock*

- Odumosu O, Nicholas D, Yano H, Langridge W. AB toxins: a paradigm switch from deadly to desirable. *Toxins (Basel)*. 2010;2(7):1612–1645.
- Krakauer T. Staphylococcal superantigens: pyrogenic toxins induce toxic shock. *Toxins (Basel)*. 2019;11(3):178.
- Hase CC, Finkelstein RA. Bacterial extracellular zinc-containing metalloproteases. *Microbiol Rev*. 1993;57(4):823–837. — *the enzymatic spreading factors of 6.1*

Additional — biofilms and quorum sensing

- Costerton JW, Stewart PS, Greenberg EP. Bacterial biofilms: a common cause of persistent infections. *Science*. 1999;284(5418):1318–1322.
- Flemming HC, Wingender J, Szewzyk U, Steinberg P, Rice SA, Kjelleberg S. Biofilms: an emergent form of bacterial life. *Nat Rev Microbiol*. 2016;14(9):563–575.
- Flemming HC, Wingender J. The biofilm matrix. *Nat Rev Microbiol*. 2010;8(9):623–633.
- Rutherford ST, Bassler BL. Bacterial quorum sensing: its role in virulence and possibilities for its control. *Cold Spring Harb Perspect Med*. 2012;2(11):a012427.
- Ciofu O, Moser C, Jensen PØ, Høiby N. Tolerance and resistance of microbial biofilms. *Nat Rev Microbiol*. 2022;20(10):621–635. — *the distinction between tolerance and genetic resistance*
- Marsh PD. Dental plaque as a biofilm and a microbial community — *implications for health and disease*. *BMC Oral Health*. 2006;6 Suppl 1:S14.
- Bowen WH, Burne RA, Wu H, Koo H. Oral biofilms: pathogens, matrix, and polymicrobial interactions in microenvironments. *Trends Microbiol*. 2018;26(3):229–242.

Additional — host defences

- Medzhitov R. Recognition of microorganisms and activation of the immune response. *Nature*. 2007;449(7164):819–826. — *pattern recognition receptors for 6.3*
- Takeuchi O, Akira S. Pattern recognition receptors and inflammation. *Cell*. 2010;140(6):805–820.
- Fábíán TK, Hermann P, Beck A, Fejérdy P, Fábíán G. Salivary defense proteins: their network and role in innate and acquired oral immunity. *Int J Mol Sci*. 2012;13(4):4295–4320.
- Lyng Pedersen AM, Belstrøm D. The role of natural salivary defences in maintaining a healthy oral microbiota. *J Dent*. 2019;80 Suppl 1:S3–S12.
- Moutsopoulos NM, Konkel JE. Tissue-specific immunity at the oral mucosal barrier. *Trends Immunol*. 2018;39(4):276–287.
- Brinkmann V, Zychlinsky A. Neutrophil extracellular traps: is immunity the second function of chromatin? *J Cell Biol*. 2012;198(5):773–783.

Chapter 7 — Introduction to Antimicrobials and Resistance

7.1 Antimicrobial principles (narrow vs broad spectrum; bactericidal vs bacteriostatic; the MIC concept) · 7.2 Mechanisms of resistance (enzymatic inactivation and beta-lactamases; target modification; efflux pumps; reduced permeability; biofilm-mediated resistance) · 7.3 Rational antibiotic use in dentistry (indications vs non-indications; prophylaxis; stewardship)

Core reading: [1] Ch. 28 · [2] Ch. 17 · [4] Ch. 9 · [5] Section 1 · [7] Ch. 23 · [9] Ch. 7 and Ch. 36 · [10] Ch. 16 · [21] · [22] · [23] · [29] · [30] · [33]

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Chapter 8 — Systemic Bacteriology (Organism-Based Study)

8.1 Gram-positive cocci (*Staphylococcus*, *Streptococcus*, *viridans streptococci*) · 8.2 Gram-negative cocci (*Neisseria*) · 8.3 Gram-positive bacilli (*Corynebacterium diphtheriae*, *Bacillus*, *Clostridium*) · 8.4 Gram-negative bacilli (*Escherichia coli*, *Pseudomonas*, *Klebsiella*, *Proteus*) · 8.5 Anaerobes (*Bacteroides*, *Prevotella*, *Porphyromonas*, *Fusobacterium*, *Actinomyces*) · 8.6 *Spirochaetes* (*Treponema*; oral *spirochaetes* in periodontal disease)

Core reading: [1] Ch. 13–24 · [2] Ch. 18–36 · [3] organism chapters throughout · [4] Sections 3–4 · [5] Section 2 · [9] Ch. 11–16 · [10] Ch. 3 and Ch. 9–14 · [17] for reference-level detail

Additional — Gram-positive cocci

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Additional — Gram-negative cocci and bacilli

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Additional — Gram-positive bacilli and spore formers

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Additional — anaerobes and oral organisms

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Additional — spirochaetes

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Chapter 9 — Oral Microbiology

9.1 Normal oral flora (resident vs transient; age-related change; effect of saliva, diet, hygiene and antibiotics) · 9.2 Dental plaque biofilm ecology (pellicle formation; early and late colonisers; plaque maturation and calculus) · 9.3 Caries microbiology (Streptococcus mutans group, lactobacilli, Actinomyces; the ecological plaque hypothesis) · 9.4 Periodontal microbiology (gingivitis vs periodontitis flora; the red complex) · 9.5 Endodontic infections (primary vs secondary; anaerobe predominance; Enterococcus faecalis) · 9.6 Oral opportunistic infections (Candida; oral viral infections)

Core reading: [9] Ch. 17–33 · [10] Ch. 3–5 and Ch. 8–14 · [11] throughout · [12] Ch. 5–8 · [13] for clinical correlation · [14] for periodontal microbiology

Additional — the oral microbiome and normal flora

- Dewhirst FE, Chen T, Izard J, Paster BJ, Tanner ACR, Yu WH, et al. The human oral microbiome. J Bacteriol. 2010;192(19):5002–5017.
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Additional — plaque biofilm ecology

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Additional — caries microbiology

- Marsh PD. Are dental diseases examples of ecological catastrophes? *Microbiology*. 2003;149(Pt 2):279–294. — *the original statement of the ecological plaque hypothesis*
- Takahashi N, Nyvad B. The role of bacteria in the caries process: ecological perspectives. *J Dent Res*. 2011;90(3):294–303. — *the extended caries ecological hypothesis*
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Additional — periodontal microbiology

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Additional — endodontic and opportunistic oral infections

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- Siqueira JF Jr, Rôças IN. Diversity of endodontic microbiota revisited. *J Dent Res.* 2009;88(11):969–981.
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- Ricucci D, Siqueira JF Jr. Biofilms and apical periodontitis: study of prevalence and association with clinical and histopathologic findings. *J Endod.* 2010;36(8):1277–1288.
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Chapter 10 — Virology (Core Concepts and Dental Relevance)

10.1 Basics of viruses (capsid, envelope and genome; the replication cycle from attachment to release; cytopathic effects) · 10.2 Clinically important viruses (HSV-1/2 and primary herpetic gingivostomatitis; VZV; EBV, infectious mononucleosis and oral hairy leukoplakia; HPV and its cancer association; HBV and HCV; HIV and opportunistic infection) · 10.3 Viral infection control in dentistry (standard precautions; post-exposure management)

Core reading: [1] Ch. 29–46 · [2] Ch. 37–56 · [4] Section 5 · [5] Section 1 and 2 · [9] Ch. 14 and Ch. 30 · [10] Ch. 12 · [13] for oral presentation · [18] for reference-level detail

Additional — virus structure and replication

- Louten J. *Essential Human Virology*. 2nd ed. London: Academic Press; 2022. — *undergraduate-level treatment of structure and the replication cycle*
- Dimitrov DS. Virus entry: molecular mechanisms and biomedical applications. *Nat Rev Microbiol.* 2004;2(2):109–122.
- Grove J, Marsh M. The cell biology of receptor-mediated virus entry. *J Cell Biol.* 2011;195(7):1071–1082.
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- Whitley RJ, Roizman B. Herpes simplex virus infections. *Lancet.* 2001;357(9267):1513–1518.
- Arduino PG, Porter SR. Herpes simplex virus type 1 infection: overview on relevant clinico-pathological features. *J Oral Pathol Med.* 2008;37(2):107–121.
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- World Health Organization. Guidelines for the Prevention, Diagnosis, Care and Treatment for People with Chronic Hepatitis B Infection. Geneva: WHO; 2024.
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- Reznik DA. Oral manifestations of HIV disease. *Top HIV Med.* 2005;13(5):143–148.
- Patton LL. Oral lesions associated with human immunodeficiency virus disease. *Dent Clin North Am.* 2013;57(4):673–698.

Additional — viral cross-infection control in dentistry

- Centers for Disease Control and Prevention. Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care. Atlanta: CDC; 2016.
- Kuhar DT, Henderson DK, Struble KA, Heneine W, Thomas V, Cheever LW, et al. Updated US Public Health Service guidelines for the management of occupational exposures to human immunodeficiency virus and recommendations for postexposure prophylaxis. *Infect Control Hosp Epidemiol.* 2013;34(9):875–892.
- Schillie S, Murphy TV, Sawyer M, Ly K, Hughes E, Jiles R, et al. CDC guidance for evaluating health-care personnel for hepatitis B virus protection and for administering postexposure management. *MMWR Recomm Rep.* 2013;62(RR-10):1–19.
- Laheij AMGA, Kistler JO, Belibasakis GN, Välimaa H, de Soet JJ. Healthcare-associated viral and bacterial infections in dentistry. *J Oral Microbiol.* 2012;4:17659.
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- World Health Organization. Guidelines on Post-Exposure Prophylaxis for HIV and the Use of Co-trimoxazole Prophylaxis for HIV-related Infections. Geneva: WHO.

Chapter 11 — Mycology

11.1 Basic fungal morphology (yeasts vs moulds; dimorphic fungi) · 11.2 Oral fungal infections (Candida albicans; predisposing factors including antibiotics, diabetes, immunosuppression and dentures; pseudomembranous, erythematous and hyperplastic candidosis, angular cheilitis and denture stomatitis; basic laboratory diagnosis by smear and culture)

Core reading: [1] Ch. 45 · [2] Ch. 57–65 · [4] Section 6 · [5] Section 1 and 2 · [9] Ch. 15 and Ch. 31 · [10] Ch. 13 · [13] for clinical presentation · [31]

Additional — fungal biology and morphology

- Gow NAR, Latge JP, Munro CA. The fungal cell wall: structure, biosynthesis, and function. *Microbiol Spectr.* 2017;5(3):FUNK-0035-2016. — *chitin, glucans, mannoproteins and ergosterol as drug targets*
- Sudbery PE. Growth of *Candida albicans* hyphae. *Nat Rev Microbiol.* 2011;9(10):737–748. — *germ tube, pseudohypha and true hypha, and how they differ*
- Gauthier GM. Dimorphism in fungal pathogens: a coming of age. *PLoS Pathog.* 2015;11(2):e1004608.
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Additional — oral candidosis

- Williams DW, Lewis MAO. Pathogenesis and treatment of oral candidosis. *J Oral Microbiol.* 2011;3:5771. — *the reference article for 11.2*
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- Salerno C, Pascale M, Contaldo M, Esposito V, Busciolano M, Milillo L, et al. *Candida*-associated denture stomatitis. *Med Oral Patol Oral Cir Bucal.* 2011;16(2):e139–e143.
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Additional — antifungal therapy and other fungal infections

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- Nett JE, Andes DR. Antifungal agents: spectrum of activity, pharmacology, and clinical indications. *Infect Dis Clin North Am.* 2016;30(1):51–83.
- Pemán J, Cantón E, Espinel-Ingroff A. Antifungal drug resistance mechanisms. *Expert Rev Anti Infect Ther.* 2009;7(4):453–460. — *including intrinsic fluconazole resistance in *Candida krusei**
- Skiada A, Pavleas I, Drogari-Apiranthitou M. Epidemiology and diagnosis of mucormycosis: an update. *J Fungi (Basel).* 2020;6(4):265.
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- World Health Organization. WHO Fungal Priority Pathogens List to Guide Research, Development and Public Health Action. Geneva: WHO; 2022.

Chapter 12 — Parasitology (Introduction)

12.1 Protozoa (*Entamoeba* and *Giardia*) · 12.2 Helminths (nematodes, cestodes and trematodes — terminology, life cycles and transmission)

Core reading: [1] Ch. 46 · [2] Ch. 66–79 · [4] Section 7 · [5] Section 3 · [17] for reference-level detail · [20] for clinical presentation

Additional — protozoa

- Haque R, Huston CD, Hughes M, Houpt E, Petri WA Jr. Amebiasis. *N Engl J Med*. 2003;348(16):1565–1573.
- Shirley DT, Farr L, Watanabe K, Moonah S. A review of the global burden, new diagnostics, and current therapeutics for amebiasis. *Open Forum Infect Dis*. 2018;5(7):ofy161.
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Additional — helminths

- Jourdan PM, Lamberton PHL, Fenwick A, Addiss DG. Soil-transmitted helminth infections. *Lancet*. 2018;391(10117):252–265.
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- World Health Organization. Ending the Neglect to Attain the Sustainable Development Goals: a road map for neglected tropical diseases 2021–2030. Geneva: WHO; 2020.
- World Health Organization. Guideline: Preventive Chemotherapy to Control Soil-Transmitted Helminth Infections in At-Risk Population Groups. Geneva: WHO; 2017.

Chapter 13 — Diagnostic Microbiology (Practical Orientation)

13.1 Specimen collection and transport (swabs, pus aspirates, sputum, blood; aseptic technique, timing and transport media) · 13.2 Laboratory methods (smear microscopy including Gram and acid-fast stains; culture and sensitivity; serology; rapid tests and PCR) · 13.3 Interpreting reports (colonisation vs infection; contaminant vs pathogen; reading a sensitivity report)

Core reading: [1] Ch. 47 · [2] Ch. 5 and Ch. 16–17 · [4] Ch. 8 · [5] Section 1 · [9] Ch. 6 · [10] Ch. 4 · [32] · [33] · [34]

Additional — specimen collection and laboratory utilisation

- Miller JM, Binnicker MJ, Campbell S, Carroll KC, Chapin KC, Gilligan PH, et al. A guide to utilization of the microbiology laboratory for diagnosis of infectious diseases: 2018 update by the

Infectious Diseases Society of America and the American Society for Microbiology. Clin Infect Dis. 2018;67(6):e1–e94. — *the single most useful reference for 13.1 and 13.3*

- UK Health Security Agency. UK Standards for Microbiology Investigations: specimen collection, transport and processing. Available from: <https://www.gov.uk/government/collections/standards-for-microbiology-investigations-smi>
- Lamy B, Dargère S, Arendrup MC, Parienti JJ, Tattevin P. How to optimize the use of blood cultures for the diagnosis of bloodstream infections? A state-of-the-art. Front Microbiol. 2016;7:697.
- Doern GV, Carroll KC, Diekema DJ, Garey KW, Rupp ME, Weinstein MP, et al. Practical guidance for clinical microbiology laboratories: a comprehensive update on the problem of blood culture contamination. Clin Microbiol Rev. 2019;33(1):e00009-19. — *the basis of the contaminant vs pathogen judgement in 13.3*

Additional — identification, susceptibility testing and molecular methods

- Bauer AW, Kirby WMM, Sherris JC, Turck M. Antibiotic susceptibility testing by a standardized single disk method. Am J Clin Pathol. 1966;45(4):493–496. — *the original disc diffusion method*
- European Committee on Antimicrobial Susceptibility Testing. Breakpoint tables for interpretation of MICs and zone diameters. Available from: <https://www.eucast.org> — *the source of the S/I/R categories in a sensitivity report*
- Kahlmeter G, Giske CG, Kirn TJ, Sharp SE. Point-counterpoint: differences between the European Committee on Antimicrobial Susceptibility Testing and Clinical and Laboratory Standards Institute recommendations for reporting antimicrobial susceptibility results. J Clin Microbiol. 2019;57(9):e01129-19.
- Singhal N, Kumar M, Kanaujia PK, Viridi JS. MALDI-TOF mass spectrometry: an emerging technology for microbial identification and diagnosis. Front Microbiol. 2015;6:791.
- Kozel TR, Burnham-Marusich AR. Point-of-care testing for infectious diseases: past, present, and future. J Clin Microbiol. 2017;55(8):2313–2320.
- Yang S, Rothman RE. PCR-based diagnostics for infectious diseases: uses, limitations, and future applications in acute-care settings. Lancet Infect Dis. 2004;4(6):337–348.
- Siqueira JF Jr, Rôças IN. Exploiting molecular methods to explore endodontic infections: Part 1 — current molecular technologies for microbiological diagnosis. J Endod. 2005;31(6):411–423. — *the dental application of 13.2*
- World Health Organization. Diagnostic Stewardship: a guide to implementation in antimicrobial resistance surveillance sites. Geneva: WHO; 2016.

Notes for website publication

- Placement: publish Part 1 once on the Microbiology subject landing page, and attach only the relevant Part 2 block to each chapter's question set. This avoids repeating thirty-plus citations on every chapter page.
- Editions: textbook editions were current as at August 2026. Jawetz (29th ed.), Marsh and Martin's Oral Microbiology (7th ed.), Samaranayake's Essential Microbiology for Dentistry (6th ed.) and Ananthanarayan and Paniker's (13th ed.) are all recent releases — *review the list annually, and confirm edition and year against the publisher before publication.*
- Chapter mapping: the chapter numbers quoted in each "Core reading" line are indicative of where the material sits and will shift between editions. Verify them against the edition your students are prescribed before the mapping is published.
- Journal citations: volume, issue and page details should be confirmed against PubMed before publication, and DOIs added where your platform supports them.
- Guidelines: NICE, SDCEP, CDC, WHO and EUCAST documents are revised on their own cycles. Link to the landing page for each rather than to a versioned PDF, so students always reach the current release.
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