REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
1	Siegel JD, Rhinehart E, Jackson M, Chiarello L; the Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings. Centers for Disease Control and Prevention. Updated September 2024. Accessed December 19, 2024. https://www.cdc.gov/infection-control/media/pdfs/Guideline-Isolation-H.pdf	Guideline	n/a	n/a	n/a	n/a	Provides guidance for preventing transmission of infectious agents to patients and healthcare workers in the United States.	IVA
2	Infection control in health care: an overview. Project Firstline. Centers for Disease Control and Prevention. February 7, 2024. Accessed December 19, 2024. https://www.cdc.gov/project-firstline/about/index.html	Expert Opinion	n/a	n/a	n/a	n/a	For an infection to spread in healthcare five elements are necessary: a reservoir, a pathway or mode of transmission, a person to infect, a way to get around the body's defensess and microorganism survival.	VA
3	CDC's Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings. Centers for Disease Control and Prevention. April 12, 2024. Accessed December 19, 2024. https://www.cdc.gov/infection-control/hcp/core-practices/index.html	Guideline	n/a	n/a	n/a	n/a	Provides guidance on core practices to prevent infection in healthcare settings (eg aseptic technique, hand hygiene).	IVA
4	Guideline for hand hygiene. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:277-314.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for hand hygiene in the perioperative setting.	IVA
5	Boyce JM, Pittet D; Healthcare Infection Control Practices Advisory Committee, HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. MMWR Recomm Rep. 2002;51(RR-16):1-45.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for hand hygiene.	IVA
6	WHO Guidelines on Hand Hygiene in Health Care. World Health Organization. January 15, 2009. Accessed December 19, 2024. https://www.who.int/publications/i/item/9789241597906	Guideline	n/a	n/a	n/a	n/a	Provides international guidance for hand hygiene.	IVA
7	Guideline for environmental cleaning. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:197-226.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for environmental cleaning in the perioperative setting.	IVA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
8	Sehulster L, Chinn RYW, Arduino MJ, et al. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Chicago, IL: American Society for Healthcare Engineering/American Hospital Association; 2004. Updated July 2019. Accessed December 19, 2024. https://www.cdc.gov/infection-control/media/pdfs/Guideline-Environmental-H.pdf	Guideline	n/a	n/a	n/a	n/a	Provides guidance for environmental infection control in health care facilities.	IVA
9	Rutala WA, Weber DJ; Healthcare Infection Control Practices Advisory Committee (HICPAC). Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008. Updated December 7, 2023. Accessed December 19, 2024. https://www.cdc.gov/infection-control/hcp/disinfection-and-sterilization/index.html#toc	Guideline	n/a	n/a	n/a	n/a	Provides guidance for disinfection and sterilization in health care facilities in the United States.	IVA
10	Practice Guidance for Health Care Environmental Cleaning. 3rd ed. Association for the Health Care Environment; 2023.	Consensus	n/a	n/a	n/a	n/a	Provides guidance for environmental cleaning in the health care setting.	IVC
11	29 CFR 1910.1030. Bloodborne pathogens. Code of Federal Regulations. Accessed December 19, 2024. https://www.ecfr.gov/current/title-29/subtitle-B/chapter-XVII/part-1910/subpart-Z/section-1910.1030	Regulatory	n/a	n/a	n/a	n/a	Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens standard as amended pursuant to the Needlestick Safety and Prevention Act of 2000, which prescribes safeguards to protect workers against the health hazards caused by bloodborne pathogens.	n/a
12	Dörr T, Güsewell S, Flury D, et al. Association of institutional masking policies with healthcare-associated SARS-CoV-2 infections in Swiss acute care hospitals during the BA.4/5 wave (CH-SUR study): a retrospective observational study. Antimicrob Resist Infect Control. 2024;13(1):64.	Nonexperimental	444 patients with healthcare-associated SARS-CoV-2, 13 hospitals, Switzerland	n/a	n/a	Hospital mask policy at time of patient infection acquisition.	A stringent mask policy may be beneficial for a hospital experiencing an increase in healthcare associated HAI SARS-CoV-2 infections.	IIIA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
13	Kapinos KA, Salley JR, Day A. Brief cost analysis of surgical personal protective equipment during the COVID-19 pandemic. Value Health. 2022;25(8):1317-1320.	Nonexperimental	All inpatient and outpatient surgical procedures performed for 365 days, United States	n/a	Universal use of N95s vs. surgical masks	Direct medical costs of HCP infected with COVID-19 during surgical procedures;quarantine costs	If N95 respirators reduce transmission by 2.8%, prevalence is at 1%, and testing yields 20% false negatives, N95s would incur an additional $0.64 cost per HCP, of which, approximately 11 COVID-19 cases would be averted among HCP per day.	IIIA
14	Guideline for medication safety. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:487-540.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for medication safety.	IVA
15	Guideline for sharps safety. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:935-958.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for sharps safety.	IVA
16	Banned devices; powdered surgeon's gloves, powdered patient examination gloves, and absorbable powder for lubricating a surgeon's glove. Final rule. Fed Regist. 2016;81(243):91722-91731.	Regulatory	n/a	n/a	n/a	n/a	FDA regulation banning powdered gloves.	n/a
17	Guideline for a safe environment of care. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:165-196.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for a safe environment of care related to patients and perioperative personnel and the equipment used in the perioperative environment.	IVA
18	Guidance for Industry and FDA Staff: Medical Glove Guidance Manual. US Food and Drug Administration (FDA); 2008. Accessed December 19, 2024. https://www.fda.gov/media/90612/download	Regulatory	n/a	n/a	n/a	n/a	FDA guidance to manufacturers on medical gloves.	n/a
19	Olsen RJ, Lynch P, Coyle MB, Cummings J, Bokete T, Stamm WE. Examination gloves as barriers to hand contamination in clinical practice. JAMA. 1993;270(3):350-353.	Quasi-experimental	137 procedures	Vinyl gloves	Latex gloves	Glove leaks	Higher microbial contamination of the health care personnel's hands and a higher frequency of leaks were noted with vinyl gloves compared to latex.	IIB
20	Rego A, Roley L. In-use barrier integrity of gloves: latex and nitrile superior to vinyl. Am J Infect Control. 1999;27(5):405-410.	Quasi-experimental	2,000 examination gloves	800 latex, 800 vinyl, 400 nitrile gloves	n/a	Glove failure	Vinyl gloves failed 12% to 61% of the time, whereas latex and nitrile had failure rates of 0% to 4% and 1% to 3%, respectively.	IIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
21	Korniewicz DM, El-Masri M, Broyles JM, Martin CD, O'Connell KP. Performance of latex and nonlatex medical examination gloves during simulated use. Am J Infect Control. 2002;30(2):133-138.	Quasi-experimental	5,510 medical examination gloves	1,464 nitrile, 1,052 latex, 1,006 copolymer, 1,988 vinyl	n/a	Glove failure	Vinyl and copolymer (ie, polyvinyl chloride) gloves were less effective barriers than latex and nitrile. 8.2% failure rates for the vinyl and copolymer gloves compared to 1.3% for nitrile and 2.2% for latex.	IIB
22	Korniewicz DM, Kirwin M, Cresci K, et al. Barrier protection with examination gloves: double versus single. Am J Infect Control. 1994;22(1):12-15.	Quasi-experimental	886 examination gloves	Vinyl gloves	Latex gloves	Glove leaks	Vinyl gloves were much more likely to leak than latex (51.3% vs 19.7%) as demonstrated by a standardized clinical protocol designed to mimic patient care activities.	IIB
23	ASTM D7103-19(2023). Standard Guide for Assessment of Medical Gloves. West Conshohocken, PA: ASTM International; 2023.	Consensus	n/a	n/a	n/a	n/a	Guide incorporating ASTM and associated standards for the assessment, development of specifications, and selection of medical gloves with purpose of maintaining HCP sfety and health.	IVC
24	ASTM D6319-19. Standard Specification for Nitrile Examination Gloves for Medical Application. West Conshohocken, PA: ASTM International; 2019.	Consensus	n/a	n/a	n/a	n/a	Standard specification for performance of materials used in nitrile examination gloves.	IVC
25	ASTM D5250-19. Standard Specification for Poly(vinyl chloride) Gloves for Medical Application. West Conshohocken, PA: ASTM International; 2019.	Consensus	n/a	n/a	n/a	n/a	Standard specification for performance of materials used in Poly(vinyl chloride) Gloves.	IVC
26	ASTM D6977-19. Standard Specification for Polychloroprene Examination Gloves for Medical Application. West Conshohocken, PA: ASTM International (ASTM); 2019.	Consensus	n/a	n/a	n/a	n/a	Standard specification for performance of materials used in polychloroprene examination gloves.	IVC
27	ASTM D3578-19. Standard Specification for Rubber Examination Gloves. West Conshohocken, PA: ASTM International; 2019.	Consensus	n/a	n/a	n/a	n/a	Standard specification for performance of materials used in rubber examination gloves.	IVC
28	ISO 10282:2023. Single-Use Sterile Rubber Surgical Gloves – Specification. 4th ed. Geneva, Switzerland: International Organization for Standardization; 2023.	Consensus	n/a	n/a	n/a	n/a	Standard specification for performance of materials used in rubber surgical gloves.	IVC

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
29	ISO 11193-1:2020. Single-Use Medical Examination Gloves. Part 1: Specification for Gloves Made from Rubber Latex or Rubber Solution. 3rd ed. Geneva, Switzerland: International Organization for Standardization; 2020.	Consensus	n/a	n/a	n/a	n/a	Standard specification for performance of materials used in rubber latex or rubber solution examination gloves.	IVC
30	Bardorf MH, Jäger B, Boeckmans E, Kramer A, Assadian O. Influence of material properties on gloves' bacterial barrier efficacy in the presence of microperforation. Am J Infect Control. 2016;44(12):1645-1649.	Nonexperimental	9 types of medical gloves and 2 types of surgical gloves/ Laboratory, Europe	n/a	n/a	Bacterial passage through gloves, Glove elasticity	Bacterial passage through punctures is correlated with the stiffness or elasticity of the glove material. Gloves made of latex may have an increased protective effect in case of a glove breach. A risk-benefit assessment should be conducted, balancing the risk of allergy against the degree of required protection in case of a glove puncture.	IIIB
31	Guideline for sterile technique. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:1003-1048.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for sterile technique in the perioperative setting, including selection of surgical gowns.	IVA
32	Loveday HP, Lynam S, Singleton J, Wilson J. Clinical glove use: healthcare workers' actions and perceptions. J Hosp Infect. 2014;86(2):110-116.	Nonexperimental	125 health care workers/ Academic center, United Kingdom	n/a	n/a	Audit of glove use, semi-structured interview questions about clinical glove use	Glove use was inappropriate in 42% of episodes. In 37% of these episodes, there was a risk for cross-contamination mostly due to failure to remove gloves or with performing hand hygiene after use. The decision to wear gloves were influenced by socialization and emotion.	IIIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
33	Thom KA, Rock C, Robinson GL, et al. Direct gloving vs hand hygiene before donning gloves in adherence to hospital infection control practices: a cluster randomized clinical trial. JAMA Netw Open. 2023;6(10):e2336758.	RCT	3790 HCP caring for patients on contact precautions across 13 units, 4 university hospitals, United States	Direct gloving with no hand hygiene before	Hand hygiene before donning gloves	Adherence at room entry and exit; adherence to glove use upon entry for contact precautions; overall hand hygiene adherence upon entry and exit of any room	Direct gloving led to improved adherence to practice, increased use of gloves, and low bacterial contamination of gloves in units with high hand hygiene compliance. The researchers suggest direct-gloving without prior hand hygiene be considered, but not for the ER or other areas if overall adherence to glove use and hand hygiene is low.	IA
34	Sequence for putting on personal protective equipment. Centers for Disease Control and Prevention. Accessed December 19, 2024. https://www.cdc.gov/infection-control/media/pdfs/Toolkits-PPE-Sequence-P.pdf	Expert Opinion	n/a	n/a	n/a	n/a	CDC expert guidance for PPE donning and removal in health care settings.	VA
35	Kilinc FS. A review of isolation gowns in healthcare: fabric and gown properties. J Eng Fiber Fabr. 2015;10(3):180-190.	Expert Opinion	n/a	n/a	n/a	n/a	Isolation gowns currently available on the marketplace offer varying resistance to blood and other bodily fluids depending on the type of the material, its impermeability, and wear and tear.	VA
36	ANSI/AAMI PB70:2022. Liquid Barrier Performance and Classification of Protective Apparel and Drapes Intended for Use in Health Care Facilities. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2022.	Consensus	n/a	n/a	n/a	n/a	Establishes a system of classification for protective apparel used in health care facilities based on their liquid barrier performance to ultimately assist end-users in determining the type(s) of protective product most appropriate for a particular task or situation.	IVC
37	AAMI TIR11:2005/(R)2021. Selection and Use of Protective Apparel and Surgical Drapes in Health Care Facilities. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2021.	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance for the selection and use of protective apparel.	VB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
38	Premarket Notification Requirements Concerning Gowns Intended for Use in Health Care Settings. US Food and Drug Administration. December 9, 2015. Accessed December 19, 2024. https://www.fda.gov/media/92146/download	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance to industry and FDA staff on the various kinds of gowns intended to provide liquid barrier protection in health care settings.	VA
39	ASTM F3352/F3352M-23b. Standard Specification for Isolation Gowns Intended for Use in Healthcare Facilities. West Conshohocken, PA: ASTM International; 2023.	Consensus	n/a	n/a	n/a	n/a	Standard specification for physical performance of materials used in isolation gowns.	IVB
40	Kilinc-Balci FS. Investigation of the barrier performance of disposable isolation gowns. Am J Infect Control. 2023;51(12):1401-1405.	Nonexperimental	22 disposable isolation gowns from 6 manufacturers, laboratory, United States	n/a	n/a	Liquid and viral penetration (AAMI PB70)	Seven of gowns did not pass testing at claimed manufacturer's level, with majority of failure at seam and/or tie attachment areas. Improved processes and periodic postmarket testing, that may include third party laboratories are needed.	IIIB
41	Kilinc-Balci FS. Evaluation of the physical performance of disposable isolation gowns. Am J Infect Control. 2023;51(11):1201-1207.	Nonexperimental	20 commercial and 2 experimental disposable isolation gowns, laboratory, United States	n/a	n/a	Thickness, weight, tensile strength, seam strength	As a result of how the gowns were constructed, along with multiple types of fiber used, a large variation in tensile, tear, and seam strength was found.	IIIB
42	Hajar Z, Mana TSC, Tomas ME, Alhmidi H, Wilson BM, Donskey CJ. A crossover trial comparing contamination of healthcare personnel during removal of a standard gown versus a modified gown with increased skin coverage at the hands and wrists. Infect Control Hosp Epidemiol. 2019;40(11):1278-1280.	Nonexperimental	HCP simulations of removing standard and alternative design gown and gloves with fluorescing solution, VA hospital, United States	n/a	n/a	Contamination of hands and/or wrists with fluorescing solution	Alternative gown design (ie, increased coverage of hand and wrists) significantly reduced personnel contamination during removal. Education on proper removal further reduced contamination.	IIIB
43	Mana TSC, Tomas ME, Cadnum JL, Jencson AL, Piedrahita CT, Donskey CJ. A randomized trial of two cover gowns comparing contamination of healthcare personnel during removal of personal protective equipment. Infect Control Hosp Epidemiol. 2018;39(1):97-100.	RCT	31 HCP removing gown and gloves with simulated contaminants, VA hospital, United States	Alternative design cover gown	Standard cover gown	Contamination of body (hands, wrist, neck) and clothing during removal	The alternative design gown significantly reduced contamination of HCP during contaminated gown and glove removal.	IB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
44	Shah VP, Breeher LE, Hainy CM, Swift MD. Evaluation of healthcare personnel exposures to patients with severe acute respiratory coronavirus virus 2 (SARS-CoV-2) associated with personal protective equipment. Infect Control Hosp Epidemiol. 2022;43(6):770-774.	Nonexperimental	Reported patient-to-HCP COVID-19 exposure incidents, medical center, United States	n/a	n/a	Lapses in PPE	A lack of eye protection correlated significantly with transmission of SARS-CoV-2. All HCP, both within and outside a COVID-19 unit should be vigilant about wearing PPE, especialy eye protection, to mitigate transmission.	IIIB
45	Hall S, Johnson P, Bailey C, Gould Z, White R, Crook B. Evaluation of face shields, goggles, and safety glasses as a virus transmission control measure to protect the wearer against cough droplets. Ann Work Expo Health. 2023;67(1):36-49.	Nonexperimental	Simulated human cough directed toward breathing manikin head in 7 different positions, laboratory, United Kingdom	n/a	n/a	Facial(eyes, nose, mouth) deposition of fluorescent cough droplets on absorbent paper	Eye protection reduced but did not eliminate droplet exposure to wearer. Protection design and wearer orientation to cough were determinants of protection.	IIIB
46	Roberge RJ. Face shields for infection control: a review. J Occup Environ Hyg. 2016;13(4):235-242.	Expert Opinion	n/a	n/a	n/a	n/a	Guidelines for face shield use vary between governmental agencies and professional societies and little research is available regarding their efficacy. Face shields provide a barrier to body fluids and are commonly used as an alternative to goggles as they confer protection to a larger area of the face.	VB
47	Woodfield MJ, Jones RM, Sleeth DK. Influence of face shields on exposures to respirable aerosol. J Occup Environ Hyg. 2022;19(3):139-144.	Quasi-experimental	Mannequin wearing 3 face shield designs during simulated high and low breathing rates and dust aerosol ($\leq$ 5µm) dispersal, lab, United States	1. Face shield wrapped around face, covered past ears, bucket design 2. Hard shield wrapped around face covered past ears, plastic cross bar	Thin plastic face shield, attached to foam pad	Respirable aerosol concentration in breathing zone of wearer	Face shields decreased aerosol concentration when aerosols were perpendicular to face. A face shield that covered past ears toward head had lowest concentration.	IIB
48	Salimnia H, Meyer MP, Mitchell R, et al. A laboratory model demonstrating the protective effects of surgical masks, face shields, and a combination of both in a speaking simulation. Am J Infect Control. 2021;49(4):409-415.	Nonexperimental	2 mannequins, one generating bacterial suspension, other with mask, faceshield or both, laboratory, United States	n/a	n/a	Number of bacterial colonies on blood agar plates at 0.1524 and 1.8288 meters from source	Surgical masks alone provide more protection than face shield alone. No significant improvement found with combination of mask and face shield when compared to surgical mask alone.	IIIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
49	Lange VR. Eyewear contamination levels in the operating room: infection risk. Am J Infect Control. 2014;42(4):446-447.	Nonexperimental	315 pieces of eyewear worn by operating room personnel participating in 71 surgical cases in 4 OR/ Hospital, United States	n/a	n/a	Microbial growth on disposable and reusable eyewear	Microbial contamination after use was found in 37.7% of disposable and 94.9% of reusable eyewear pieces. After disinfection, 74.4% of reusable eyewear also cultured positive. Disposable eyewear may reduce contamination risk.	IIIB
50	Wendlandt R, Thomas M, Kienast B, Schulz AP. In-vitro evaluation of surgical helmet systems for protecting surgeons from droplets generated during orthopaedic procedures. J Hosp Infect. 2016;94(1):75-79.	Nonexperimental	5 gown types (some toga and some gown/hood combinations)	n/a	n/a	Ultraviolet powder contamination at the gown-glove interface as read by Likert scale from 0-4.	All 5 types of gowns had contamination at the gown-glove interface, one toga style surgical helmet system had more than other types. This interface site is an area of concern for contamination.	IIIB
51	Hirpara KM, O'Halloran E, O'Sullivan M. A quantitative assessment of facial protection systems in elective hip arthroplasty. Acta Orthop Belg. 2011;77(3):375-380.	Quasi-experimental	100 consecutive total hip replacement procedures, random selection of head covering worn.	Head covering of various configurations H	Head covering control - no head covering	Bacterial contamination	Wrap-around gowns worn over surgical attire reduced environmental contamination by 51%	IIIB
52	Putzer D, Lechner R, Coraca-Huber D, Mayr A, Nogler M, Thaler M. The extent of environmental and body contamination through aerosols by hydro-surgical debridement in the lumbar spine. Arch Orthop Trauma Surg. 2017;137(6):743-747.	Quasi-experimental	10 trials for the 2 groups in hip arthroplasty and 10 trials for the 2 groups in knee arthroplasty.	Surgical helmet system toga	Conventional gown	Simulated contamination through fluorescent droplet spray.	The study found that the forehead and neck had a 30% chance of being contaminated with splatter or spray during knee and hip arthroplasty procedures and that the surgical helmet system toga was more protective than the conventional gown.	IIIB
53	Temmesfeld MJ, Jakobsen RB, Grant P. Does a surgical helmet provide protection against aerosol transmitted disease? Acta Orthop. 2020;91(5):538-542.	Nonexperimental	Mannequin wearing surgical helmet and surgical gown next to aerosol generator, OR, university hospital, Sweden	n/a	n/a	Filtration efficiency for 0.3, 0.5.,and 5µm particles	The helmet did not filter aerosol size particles, and an accumulation of 0.3 µm sized particles were found inside the helmet. The researchers concluded that the surgical helmet should not be used for respiratory protection from aerosol containing virus.	IIIC

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
54	Lakhani R, Loh Y, Zhang TT, Kothari P. A prospective study of blood splatter in ENT. Eur Arch Otorhinolaryngol. 2015;272(7):1809-1812.	Nonexperimental	102 ENT procedures/ United Kingdom	n/a	n/a	Macroscopic and microscopic blood and saliva splash marks	54% of otolaryngology procedures resulted in splash mask contamination. Tonsillectomy, the most common operation, had a splash rate of 76.9 %.	IIIB
55	Ogo N, Foran P. The effectiveness and compliance of surgical face mask wearing in the operating suite environment: an integrated review. J Perioper Nurs. 2020;33(4):Article2.	Systematic Review	n/a	n/a	n/a	n/a	Significant association between the wearing of surgical face masks and lower environmental biological load within the OR. Surgical masks also contributed to protection of surgical team from blood and bodily fluid splatter.	IIIA
56	Surgical Masks: Premarket Notification	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance to industry and FDA staff on surgical masks and other masks including isolation and procedure masks used by health care personnel to protect the patient and healthcare personnel.	VA
57	ASTM F2100-21. Standard Specification for Performance of Materials Used in Medical Face Masks. West Conshohocken, PA: ASTM International; 2021.	Consensus	n/a	n/a	n/a	n/a	Standard specification for performance of materials used in medical face masks.	IVC
58	Chughtai AA, Stelzer-Braid S, Rawlinson W, et al. Contamination by respiratory viruses on outer surface of medical masks used by hospital healthcare workers. BMC Infect Dis. 2019;19(1):491.	Nonexperimental	148 doctors and nurses wearing medical masks during 6-8 hour shift, 3 hospitals, China	n/a	n/a	Virus presence on surface of medical masks	Overall virus positivity was 10.1% (15/148) with positivity rate higher if masks worn for >6 h and if examined >25 patients per day. Ten percent of positive samples from upper portion of mask.	IIIA
59	Jensen PA, Lambert LA, Iademarco MF, Ridzon R; CDC. Guidelines for preventing the transmission of Mycobacterium tuberculosis in health-care settings, 2005. MMWR Recomm Rep. 2005;54(RR-17):1-141.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for preventing the transmission of Mycobacterium tuberculosis (TB) in health care settings.	IVA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
60	Hospital Respiratory Protection Program Toolkit: Resources for Respirator Program Administrators. DHHS (NIOSH) Publication Number 2015-117. Atlanta, GA: Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health; 2022.	Expert Opinion	n/a	n/a	n/a	n/a	Provides information to assist hospitals in development of effective respiratory protection programs to prevent transmission of aerosol transmissible diseases to health care personnel.	VA
61	29 CFR 1910.134. Respiratory Protection. Code of Federal Regulations. Accessed December 19, 2024. https://www.ecfr.gov/current/title-29/subtitle-B/chapter-XVII/part-1910/subpart-I/section-1910.134	Regulatory	n/a	n/a	n/a	n/a	OSHA requirements for respiratory protection	n/a
62	The Respiratory Protection Information Trusted Source. The National Personal Protective Technology Library (NPPTL). Centers for Disease Control and Prevention. Accessed December 19, 2024. https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/respsource3healthcare.html	Expert Opinion	n/a	n/a	n/a	n/a	Provides information on the types of respirators used in the workplace, including a listing of all NIOSH-approved and FDA-cleared surgical N95 respirators.	VA
63	Medical Devices; Exemption from Premarket Notification: Class II Devices; Surgical Apparel. Final order. Fed Regist. 2018;83(96):22846-22848.	Regulatory	n/a	n/a	n/a	n/a	FDA final order that exempts N95 respirators from premarket notification requirements, including the 510(k) process. To qualify for this exemption, N95 manufacturers are required to have NIOSH approval, flammability testing, and testing to demonstrate the ability to resist penetration by blood and body fluids at a velocity consistent with the intended use of the device.	n/a
64	ASTM F1862/F1862M-24. Standard Test Method for Resistance of Medical Face Masks to Penetration by Synthetic Blood (Horizontal Projection of Fixed Volume at a Known Velocity). West Conshohocken, PA: ASTM International; 2024.	Consensus	n/a	n/a	n/a	n/a	Test for resistance of mask to blood penetration at 80mmHg, 120 mmHg, and 160 Hg	IVB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
65	Smith JD, MacDougall CC, Johnstone J, Copes RA, Schwartz B, Garber GE. Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis. CMAJ. 2016;188(8):567-574.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	Although N95 respirators appeared to have a protective advantage over surgical masks in laboratory settings, this metaanalysis showed that there were insufficient data to determine definitively whether N95 respirators are superior to surgical masks in protecting health care workers against transmissible acute respiratory infections in clinical settings.	IIIA
66	MacIntyre CR, Chughtai AA, Rahman B, et al. The efficacy of medical masks and respirators against respiratory infection in healthcare workers. Influenza Other Respir Viruses. 2017;11(6):511-517.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	Respirators provide superior protection against droplet-transmitted infections. To ensure health care worker safety, respirator use should be considered when developing infection control guidelines.	IB
67	Loeb M, Bartholomew A, Hashmi M, et al. Medical masks versus N95 respirators for preventing COVID-19 among health care workers: a randomized trial. Ann Intern Med. 2022;175(12):1629-1638.	RCT	1009 HCP caring for suspected or confirmed COVID-19 patients, 29 facilities, 4 countries (Canada, Israel, Pakistan, Egypt).	Fit tested N95 respirator, universal masking for 10 weeks	Medical mask, universal masking for 10 weeks	Confirmed COVID-19 on reverse transcriptase polymerase chain reaction (RT-PCR)	Positivity in medical mask group was 52 of 497 (10.46%) and 47 of 507 (9.27%) in N95 group. However, the subgroup results varied by country possibly limiting individual country applicability due to treatment effect hetrogeneity.	IB
68	Guideline for surgical smoke safety. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:1099-1142.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for surgical smoke safety.	IVA
69	Suen LKP, Yang L, Ho SSK, et al. Reliability of N95 respirators for respiratory protection before, during, and after nursing procedures. Am J Infect Control. 2017;45(9):974-978.	Quasi-experimental	120 nursing students/ Hong Kong	Performance of nursing procedures for 10 minutes while wearing fitted N95 respirator	n/a	Quantitative fit test method	Body movements during nursing procedures may increase the risk of face seal leakage.	IIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
70	O'Kelly E, Arora A, Pirog S, Ward J, Clarkson PJ. Experimental measurement of the size of gaps required to compromise fit of an N95 respirator. Disaster Med Public Health Prep. 2022;17:e118.	Nonexperimental	2 NIOSH certified N95 respirators with resin spacers, 2 volunteers, laboratory, United States	n/a	n/a	Quantitative testing (QNFT) to determine leak size that compromises performance/fit	The minimum gap size to compromise N95 performance was between 1.5 mm^2 and 3 mm^2 which can be difficult to see, supporting value of routine quantitive fit testing	IIIC
71	Appendix A to 29 CFR 1910.134 – Fit Testing Procedures (Mandatory). Code of Federal Regulations. Accessed December 19, 2024. https://www.ecfr.gov/current/title-29/subtitle-B/chapter-XVII/part-1910/subpart-I/section-1910.134	Regulatory	n/a	n/a	n/a	n/a	Descriptions of required fit testing methods, both qualitative and quantitiative.	n/a
72	Bhatia DDS, Bhatia KS, Saluja T, et al. Under-mask beard covers achieve an adequate seal with tight-fitting disposable respirators using quantitative fit testing. J Hosp Infect. 2022;128:8-12.	Nonexperimental	30 Sikh males wearing elastic resistance band under filtering facepiece respirator, lab, Australia	n/a	n/a	Quantitative fit testing (QNFT)	In HCP with facial hair who can not shave, the under-mask beard cover technique may be used to achieve satisfactory seal with P2/N95 respirators.	IIIC
73	Williams DL, Kave B, Bodas C, Begg F, Roberts M, Ng I. Prospective comprehensive evaluation of an elastic-band beard cover for filtering facepiece respirators in healthcare workers. Infect Control Hosp Epidemiol. 2024;45(1):89-95.	Quasi-experimental	87 HCP who could not shave for religious, cultural, or medical reasons, Royal Melbourne Hospital, Australia	2 different types of FFRs each with elastic-band beard cover following on-line application education and face-to-face training	2 different types of FFRs with no elastic-band beard cover	Consecutive quantitative fit testing (QNFT), skill and usability assessment	With standardized education and training elastic-band beard cover technique can provide a smooth surface and respirator seal safe for bearded HCP. Further research and evaluation of technique is recommended with broader implementation and use of different FFRs.	IIB
74	Guideline for surgical attire. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:1083-1098.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for surgical attire in the perioperative setting.	IVA
75	Global Technical Consultation Report on Proposed Terminology for Pathogens that Transmit Through the Air. Geneva, Switzerland: World Health Organization; 2024.	Consensus	n/a	n/a	n/a	n/a	Agreement reached by WHO and 4 global public health agencies on terminology for pathogens that transmit through the air.	IVA
76	Talbot TR, May AK, Obremskey WT, Wright PW, Daniels TL. Intraoperative patient-to-healthcare-worker transmission of invasive group A streptococcal infection. Infect Control Hosp Epidemiol. 2011;32(9):924-926.	Case Report	Group A *Streptococcus* infection transmitted from patient to surgeon, United States	n/a	n/a	n/a	Adherence to standard precautions is important, including the removal of contaminated clothing as soon as possible after exposure and the cleaning of contaminated skin.	VB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
77	Siegel JD, Rhinehart E, Jackson M, Chiarello L; Healthcare Infection Control Practices Advisory Committee. Management of multidrug-resistant organisms in healthcare settings, 2006. Am J Infect Control. 2007;35(10 Suppl 2):S165-S193.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for management of MRSA, VRE, and other MDROs in health care organizations in the United States.	IVA
78	Popovich KJ, Aureden K, Ham DC, et al. SHEA/IDSA/APIC Practice Recommendation: Strategies to prevent methicillin-resistant Staphylococcus aureus transmission and infection in acute-care hospitals: 2022 update. Infect Control Hosp Epidemiol. 2023;44(7):1039-1067.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for management of MRSA in health care organizations.	IVB
79	Kociolek LK, Gerding DN, Carrico R, et al. Strategies to prevent Clostridioides difficile infections in acute-care hospitals: 2022 update. Infect Control Hosp Epidemiol. 2023;44(4):527-549.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for prevention and management of *C difficile* in health care organizations.	IVA
80	McDonald LC, Gerding DN, Johnson S, et al. Clinical practice guidelines for Clostridium difficile infection in adults and children: 2017 update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA). Clin Infect Dis. 2018;66(7):e1-e48.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for management of MRSA, VRE, and other MDROs in health care organizations in the United States.	IVA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
81	Abad C, Fearday A, Safdar N. Adverse effects of isolation in hospitalised patients: a systematic review. J Hosp Infect. 2010;76(2):97-102.	Systematic Review	16 studies	n/a	n/a	n/a	Contact isolation may negatively impact several dimensions of patient care. The evidence showed a negative impact on patient mental well-being and behavior, including higher scores for depression, anxiety and anger among isolated patients. A few studies also found that healthcare workers spent less time with patients in isolation. Patient satisfaction was adversely affected by isolation if patients were kept uninformed of their healthcare. Patient safety was also negatively affected, leading to an eight-fold increase in adverse events related to supportive care failures. Patient education may be an important step to mitigate the adverse psychological effects of isolation and is recommended.	IIIB
82	Morgan DJ, Diekema DJ, Sepkowitz K, Perencevich EN. Adverse outcomes associated with contact precautions: a review of the literature. Am J Infect Control. 2009;37(2):85-93.	Literature Review	n/a	n/a	n/a	n/a	Patients in contact precautions may experience adverse outcomes: less patient-to-health care provider contact, changes to systems of care that produce delays and more noninfectious adverse events, increased symptoms of depression and anxiety, and decreased satisfaction with care.	VA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
83	Findik UY, Ozbaş A, Cavdar I, Erkan T, Topcu SY. Effects of the contact isolation application on anxiety and depression levels of the patients. Int J Nurs Pract. 2012;18(4):340-346.	Quasi-experimental	60 isolated and 57 non-isolated patients with hospital infection/ University medical center, Turkey	Contact precautions	Not in contact precautions	Anxiety and Depression as measured by the Hospital Anxiety and Depression Scale	There was no statistically significant difference between the anxiety and depression levels of the isolated and non-isolated patients. Of the patients, 86.4% of them told that they were happy to be in the isolation room. Personal attributes increased the development of depression. In contact isolated patients, personal attributes should be taken into consideration in nursing care planning to prevent development of depression.	IIC
84	Day HR, Perencevich EN, Harris AD, et al. Depression, anxiety, and moods of hospitalized patients under contact precautions. Infect Control Hosp Epidemiol. 2013;34(3):251-258.	Quasi-experimental	1,876 medical and surgical patients/ Tertiary care hospital, United States	Contact precautions	Not in contact precautions	Anxiety and depression as measured by the Hospital Anxiety and Depression Scale	Patients under contact precautions have more symptoms of depression and anxiety at hospital admission but do not appear to be more likely to develop depression, anxiety, or negative moods while under contact precautions. The use of contact precautions should not be restricted by the belief that contact precautions will produce more depression or anxiety.	IIA
85	Munoz-Price LS, Banach DB, Bearman G, et al. Isolation precautions for visitors. Infect Control Hosp Epidemiol. 2015;36(7):747-758.	Expert Opinion	n/a	n/a	n/a	n/a	SHEA expert guidance for use of isolation precautions by visitors.	VA
86	Popovic M, Beathe J, Gbaje E, Sharp M, Memtsoudis SG. Effect of portable negative pressure units on expelled aerosols in the operating room environment. Reg Anesth Pain Med. 2022;47(7):426-429.	Nonexperimental	Mannequin with endotracheal tube connected to saline aerosol generator, empty OR with portable negative pressure (PNP) unit, United States	n/a	n/a	Aerosol concentration and particle size at 10 & 30 cm from aerosol generation site	PNP unit significantly reduced particle sizes of 0.5 μm, 0.7 μm, and 1.0 μm, suggesting PNP units may be useful in reducing risk to anesthesia providers.	IIIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
87	Olmsted RN. Pilot study of directional airflow and containment of airborne particles in the size of Mycobacterium tuberculosis in an operating room. Am J Infect Control. 2008;36(4):260-267.	Quasi-experimental	Laboratory, One OR over a 2-day period	Novel portable anteroom system (PAS)-high-efficiency particulate air (HEPA) combination unit	Freestanding portable HEPA filter units	Removal of smoke plume	The PAS-HEPA unit achieved a downward evacuation of plume, away and toward the main entry door from the sterile field. Comparatively, the portable freestanding HEPA unit inside the OR moved the plume vertically upward and directly into the breathing zone where the surgical team would be during a procedure.	IIC
88	Infection Prevention and Control of Epidemic- and Pandemic-Prone Acute Respiratory Infections. Geneva, Switzerland: World Health Organization; 2014.	Guideline	n/a	n/a	n/a	n/a	Recommendations on infection prevention and control measures for acute respiratory infections that have potential for rapid spread, possibly leading to a epidemic or pandemic.	IVA
89	Hamilton F, Arnold D, Bzdek BR, et al. Aerosol generating procedures: are they of relevance for transmission of SARS-CoV-2? Lancet Respir Med. 2021;9(7):687-689.	Expert Opinion	n/a	n/a	n/a	n/a	Emerging evidence indicates currently defined AGPS are unlikely to generate infectious aerosols posing risk to staff. Propose instead consideation of close, physical exposure to those with respiratory virus for prolonged time or in poor ventilation.	VB
90	Klompas M, Baker M, Rhee C. What is an aerosol-generating procedure? JAMA Surg. 2021;156(2):113-114.	Expert Opinion	n/a	n/a	n/a	n/a	When considering the transmission potential of respiratory viruses during medical procedures it is important to evaluate the amount of forced air that will be expelled, the symptom and disease severity, the distance from patient and duration of procedure.	VA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
91	Silvers A, Brewster DJ, Ford A, Licina A, Andrews C, Adams M. Re-evaluating our language when reducing risk of SARS-CoV-2 transmission to healthcare workers: time to rethink the term, "aerosol-generating procedures." Virol J. 2022;19(1):189.	Literature Review	n/a	n/a	n/a	n/a	Aerosol-generating procedures should not be an independent risk factor for transmission of SARS-CoV2. Instead an individual risk assessment of the clinical context of exposure should be used as basis for infection prevention practices. .	VB
92	Sanmark E, Oksanen LAH, Rantanen N, et al. Aerosol generation during coughing: an observational study. J Laryngol Otol. 2023;137(4):442-447.	Nonexperimental	306 volitional coughs from 37 volunteers and involuntary coughs from 15 elective surgery patients, 2 laminar flow ORs, university hospital, Finland	n/a	n/a	Particle generation (concentration, size)	No statistical difference was found in aerosol production between an intentional or involuntary cough. Research authors suggest study results could be used to assess and compare the risk of aerosol generation during surgery to that of coughing (lower risk, similar risk, higher risk).	IIIB
93	Dhillon RS, Rowin WA, Humphries RS, et al. Aerosolisation during tracheal intubation and extubation in an operating theatre setting. Anaesthesia. 2021;76(2):182-188.	Nonexperimental	Three patients undergoing endonasal pituitary surgery, OR with normal ventilation, Austraila	n/a	n/a	Aerosal production; aerosal characterization	Small particles (< 5μm) were generated from facemask ventilation, intubation, and cuff inflation at a rate 30-300 times greater than normal activity. Particles remained suspended and spread from patient nose toward air exhaust in direction of patient's feet.	IIIB
94	Brown J, Gregson FKA, Shrimpton A, et al. A quantitative evaluation of aerosol generation during tracheal intubation and extubation. Anaesthesia. 2021;76(2):174-181.	Nonexperimental	19 intubations and 14 extubations,orthopedic and neurological emergency surgeries, 4 ultraclean ventilated ORs, United Kingdom	n/a	Volitional coughs (n=38)	Airborne particle size distribution; airborne paticle concentration	Less aerosol is produced by intubation (1.4 particles/L) and extubation (21 particles/L) than is produced by voluntary coughing (732 particles/L). When comparing intubation to extubation, more aerosal is produced with extubation.	IIIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
95	Shrimpton AJ, Gregson FKA, Brown JM, et al. A quantitative evaluation of aerosol generation during supraglottic airway insertion and removal. Anaesthesia. 2021;76(12):1577-1584.	Nonexperimental	12 supraglotic airway insertion and removal, surgical patients, ultraclean OR, hospital, United Kingdom	n/a	n/a	Aerosol particle (0.3–10-µm diameter) generation and distribution	Supraglotic airway insertion and removal produced no more aerosol than breathing and far less aerosol than a volitional cough. Researchers concluded supraglotic airways do not meet criterian to be an AGP.	IIIB
96	Zietsman M, Phan LT, Jones RM. Potential for occupational exposures to pathogens during bronchoscopy procedures. J Occup Environ Hyg. 2019;16(10):707-716.	Nonexperimental	7 pulmonologists performing 18 bronchoscopy procedures,procedure room, hospital, United States	n/a	n/a	Number of ultrafine and respirable aerosols near head of patient; Determinants of exposure (contact patterns, PPE use, PPE removal)	Bronchoscopy was not associated with elevated mean ultrafine and respirable aerosols, although peak exposures of short-duration were found. Participants had frequent contact with environmental surfaces and removal of PPE was not consistent with CDC recommendations.	IIIB
97	State Operations Manual. Appendix Z – Emergency Preparedness for All Provider and Certified Supplier Types. Interpretive Guidance. Rev 204, 04-16-21. Centers for Medicare and Medicaid Services. Accessed December 19, 2024. https://www.cms.gov/files/document/r204soma.pdf	Regulatory	n/a	n/a	n/a	n/a	Interpretive guidance for emergency preparedness condition of participation	n/a
98	ANSI/ ASHRAE/ ASHE Standard 170-2021: Ventilation of Health Care Facilities. American Society for Healthcare Engineering of the American Hospital Association; 2021:50. Accessed December 19, 2024. https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards	Consensus	n/a	n/a	n/a	n/a	Recommendations for the HVAC system in health care facilities.	IVC
99	Newsom RB, Amara A, Hicks A, et al. Comparison of droplet spread in standard and laminar flow operating theatres: SPRAY study group. J Hosp Infect. 2021;110:194-200.	Nonexperimental	Extubation cough model on OR bed, laminar and non-laminar flow OR, United Kingdom	n/a	n/a	Droplet splatter size and spread	Substantial droplet spread beyond 2m (6 feet) was seen in both ventilation types. However, the distance traveled by smaller droplets (~120µm) was reduced in laminar flow. More research is needed on droplet spread and AGPs.	IIIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
100	Murr A, Lenze NR, Brown WC, et al. Quantification of aerosol particle concentrations during endoscopic sinonasal surgery in the operating room. Am J Rhinol Allergy. 2021;35(4):426-431.	Nonexperimental	COVID-19 negative patients undergoing 5 endoscopic nasal and skull base surgeries, OR, university hospital, United States	n/a	n/a	Airborne (1-10µm in diameter) particle concentrations using optical particle counter	Endonasal drilling and microdebrider use significantly increased airborne particle (0.3-10µm) concentrations. Concentration was limited to area of surgeon, with no increase noted in other OR positions.	IIIB
101	Russo F, Valentini M, Sabatino D, et al. Aerosolization risk during endoscopic transnasal surgery: a prospective qualitative and quantitative microscopic analysis of particles spreading in the operating room. J Neurosurg. 2022;136(3):822-830.	Nonexperimental	Ten endoscopic endonasal surgical procedures, laminar flow operating room, university hospital, Italy	n/a	n/a	Droplet contamination on surgical masks; splatter patterns using fluorescence microscopy	Significant number of contaminants (ie, liquid droplets, bone, tissue) found in OR, some of which were >5µm. High degree of HCP contamination found at all distancea from patient. Researchers recommend all perioperative personnel wear N95 masks and protective goggles or face shields.	IIIB
102	Williams SP, Leong SC. One year into the COVID-19 pandemic: what do we know so far from studies assessing risk and mitigation of droplet aerosolisation during endonasal surgery? A systematic review. Clin Otolaryngol. 2021;46(6):1368-1378.	Systematic Review	n/a	n/a	n/a	n/a	Endonasal surgery carries significant risk for aerosolization of droplets and smaller particles. Strict adherence and appropriate use of PPE is necessary for preventing COVID-19 transmission.	IIIA
103	Gomez Serrano M, Santiago-Saez A, Moreno Rodriguez R, et al. Analysis of aerosol production and aerosol dispersion during otologic surgery. Eur Arch Otorhinolaryngol. 2022;279(7):3363-3369.	Nonexperimental	Drilling with continuous tinted irrigation on cadaver mastoid bone, autopsy room, Germany	n/a	n/a	Droplet dispersion and size on semi-absorbant paper at different heights near head and 150 cm	Drilling increased amount of aerosols produced. Droplets ranged from 2 µm to 2.6 cm reaching a distance of 150 cm.	IIIC
104	Khamar P, Shetty R, Balakrishnan N, et al. Quantitative shadowgraphy of aerosol and droplet creation during oscillatory motion of the microkeratome amid COVID-19 and other infectious diseases. J Cataract Refract Surg. 2020;46(10):1416-1421.	Nonexperimental	Flap creation using microkeratome on 8 goat eyes, laboratory, India	n/a	n/a	Aerosol and droplet generation	Droplets generated during flap cut with microkeratome were large (> 90µm) and traveled up to 1.8 m. Researchers advise precautions during flap cut to avoid contact with settled droplets.	IIIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
105	McGhee CNJ, Dean S, Freundlich SEN, et al. Microdroplet and spatter contamination during phacoemulsification cataract surgery in the era of COVID-19. Clin Exp Ophthalmol. 2020;48(9):1168-1174.	Nonexperimental	Two opthalmic teams performing 5 phacoemulsifications of porcine eyes in OR, academic hospital, New Zealand	n/a	n/a	Microdroplet generation and splatter distribution of fluorescein irrigation fluid	Splatter is produced but with only minimal micro-droplet generation, supportingt use of standard surgical PPE during phacoemulsification.	IIIC
106	Sharma S, John R, Patel S, Neradi D, Kishore K, Dhillon MS. Bioaerosols in orthopedic surgical procedures and implications for clinical practice in the times of COVID-19: a systematic review and meta-analysis. J Clin Orthop Trauma. 2021;17:239-253.	Systematic Review w/ Meta-Analysis	n/a	n/a	n/a	n/a	Orthopedic instruments and power tools generate aerosals of different sizes with marjority less than 5µm in size. However, evidence on the infection transmission from these devices is lacking high-quality evidence making it questionable.	IIIA
107	Hardy N, Dalli J, Khan MF, Nolan K, Cahill RA. Aerosols, airflow, and airspace contamination during laparoscopy. Br J Surg. 2021;108(9):1022-1025.	Nonexperimental	6 elective laparoscopic procedures, university hospital, Ireland	n/a	n/a	Particle count before incision and during procedure at 10 cm from target area	Counts increased after surgery began, reaching excess of 1 x 10^6 particles per m^3. The majority of particle sizes were 0.3-0.5µm, except for cholecystectomy which was 5-10µm.	IIIB
108	Bogani G, Ditto A, De Cecco L, et al. Transmission of SARS-CoV-2 in surgical smoke during laparoscopy: a prospective, proof-of-concept study. J Minim Invasive Gynecol. 2021;28(8):1519-1525.	Nonexperimental	17 laparoscopic surgery patients, cancer center, Italy	n/a	n/a	Reverse transcription-polymerase chain reaction (RT-PCR) for presence of SARS-Co-V-2 in endotracheal tube & trocar valve filter	Researchers concluded SARS-CoV-2 might be transmitted through surgical smoke and aerosolized abdominal fluid, indicating PPE is necessary.	IIIB
109	Romero-Velez G, Rodriguez Quintero JH, Pereira X, Nussbaum JE, McAuliffe JC. SARS-CoV-2 during abdominal operations: are surgeons at risk? Surg Laparosc Endosc Percutan Tech. 2021;31(6):674-678.	Nonexperimental	6 COVID-19 positive adult patients undergoing abdominal surgery (4 laparoscopic, 2 open), medical center, United States	n/a	n/a	Presence of SARS-CoV-2 in peritoneal samples for all procedures; presence of SARS-CoV-2 in surgical smoke in laparoscopic procedures	SARS-CoV-2 was not found in patients' peritoneal cavity or surgical plume. However the risk of transmission during surgery is still unclear, therefore N95 wear, avoiding droplet spatter and specific operative techniques with laparoscopy are recommended.	IIIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
110	Sowerby LJ, Nichols AC, Gibson R, et al. Assessing the risk of SARS-CoV-2 transmission via surgical electrocautery plume. JAMA Surg. 2021;156(9):883-885.	Nonexperimental	3 electrocautery methods (cut, coagulate, bipolar) performed on raw chicken breast with infectious dose of SARS-CoV-2 for 1 minute at 25 W, laboratory, Canada	n/a	n/a	Live SARS-CoV-2 virus in electrocautery plume	SARS-CoV-2 virus was not detected in any aerosol cautery plume. Researchers suggest further studies are needed in patients undergoing airway surgery who are postiive for SARS-CoV-2 virus.	IIIB
111	Lee PE, Kozak R, Alavi N, et al. Detection of SARS-CoV-2 contamination in the operating room and birthing room setting: a cross-sectional study. CMAJ Open. 2022;10(2):E450-E459.	Nonexperimental	32 patients with positive RT-PCR nasal swab for SARS-CoV2 undergoing urgent surgeries (n = 23) and obstetric deliveries (n=9), 2 academic hospitals, Canada	n/a	n/a	SARS-CoV2 RNA PCR-positive samples on inner surface of HCP masks, surgical site, surgical instruments or equipment used, air, and floor.	Small number of SARS-CoV2 virus were present in the surgical and obstetric environment, instruments and equipment, reinforcing need for proper cleaning. However, no detectable virus was found inside HCP masks (0 of 143), suggesting the risk for infections is low when proper PPE is worn.	IIIB
112	Cheruiyot I, Sehmi P, Ngure B, et al. Laparoscopic surgery during the COVID-19 pandemic: detection of SARS-COV-2 in abdominal tissues, fluids, and surgical smoke. Langenbecks Arch Surg. 2021;406(4):1007-1014.	Systematic Review	n/a	n/a	n/a	n/a	Available evidence does not indicate SARS-COV-2 can be aerosolized and transmitted through surgical smoke. Conflicting evidence exists on SARS-COV-2 presence in abdominal tissue and fluids.	IIIA
113	Mintz Y, Arezzo A, Boni L, et al. The risk of COVID-19 transmission by laparoscopic smoke may be lower than for laparotomy: a narrative review. Surg Endosc. 2020;34(8):3298-3305.	Literature Review	n/a	n/a	n/a	n/a	When performed in closed cavity with smoke evacuation and if not contraindicated for the patient, laparoscopy may be safer for surgical team than laparotomy.	VA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
114	Zakka K, Erridge S, Chidambaram S, et al. Electrocautery, diathermy, and surgical energy devices: are surgical teams at risk during the COVID-19 pandemic? Ann Surg. 2020;272(3):e257-e262.	Literature Review	n/a	n/a	n/a	n/a	No definitive evidence was found on SARS-CoV-2 transmission through aerosolized surgical smoke. However, other viruses have been identified from energy device aerosolization, so protective measures for the surgical team when caring for positive or suspected COVID-19 patients undergoing laparoscopic surgery is plausible.	VA
115	Ionescu AC, Cagetti MG, Ferracane JL, Garcia-Godoy F, Brambilla E. Topographic aspects of airborne contamination caused by the use of dental handpieces in the operative environment. J Am Dent Assoc. 2020;151(9):660-667.	Nonexperimental	3 standardized dental procedures on manikin mouth infused with *Streptococcus mutans* , dental clinic, Italy	n/a	n/a	Mapping and quantification of *Streptococcus mutans* on instruments and surrounding surfaces	Minimize or avoid use of rotary and oscillating handpieces when concern for airborne spread of pandemic disease agents is present. When using, disinfection of all surfaces within 360 cm of patient's oral category is necessary.	IIIB
116	Zheng M, Lui C, O'Dell K, M Johns M, Ference EH, Hur K. Aerosol generation during laryngology procedures in the operating room. Laryngoscope. 2021;131(12):2759-2765.	Nonexperimental	10 patients undergoing laryngology surgery, outpatient surgery center, United States	n/a	n/a	Number of airborne particles (0.3-25µm) using optical particle counter for 15 seconds	Greater than 99% of measured particles were 0.3 to 1.0µm in diameter. Larger particles measuring 1.0 to 2.5µm in diameter significantly decreased compared to baseline. The researchers concluded that judicious use of PPE is necessary during laryngology procedures.	IIIB
117	Welsh Surgical Research Initiative (WSRI) Collaborative. Recommended operating room practice during the COVID-19 pandemic: systematic review. BJS Open. 2020;4(5):748-756.	Systematic Review	n/a	n/a	n/a	n/a	Recommendations focused on room design, appropriate PPE, patient and personnel screening, delay of elective procedures,and minimizing intraoperative aerosol generation is recommended when proceeding with surgery.	IIIA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
118	Brant-Zawadzki GM, Ockerse P, Brunson JR, et al. An aerosol containment and filtration tent for intubation during the COVID-19 pandemic. Surg Innov. 2021;28(2):226-230.	Nonexperimental	Particle generation inside intubation tent with and without vacuum fan, simulation lab, United States	n/a	n/a	Particle count inside and outside tent	Intubation tent has potential to decrease HCPs' exposure to infectious droplets and aerosal particles	IIIB
119	Chen JX, Workman AD, Chari DA, et al. Demonstration and mitigation of aerosol and particle dispersion during mastoidectomy relevant to the COVID-19 era. Otol Neurotol. 2020;41(9):1230-1239.	Nonexperimental	Cadaveric heads with fluorescein solution, high-speed drill used for 1-minute, lab, United States	n/a	n/a	Dispersed particulate matter	A simple barrier drape significantly reduced particulate dispersion	IIIB
120	Cottrell J, Lui J, Le T, Chen J. An operative barrier system for skull base and mastoid surgery: creating a safe operative theatre in the era of COVID-19. J Otolaryngol Head Neck Surg. 2020;49(1):71.	Nonexperimental	3D printed temporal bone, irrigation with fluorescein dye, high-speed drill for 5-minutes, lab, United States	n/a	n/a	Bone dust contamination; droplet contamination	Barrier system provided near complete bone dust and droplet containment within the surgical field. Bone dust and droplets found on gloved hands of surgeon and assistant, but not on other HCP.	IIIC
121	Hara T, Zachariah MA, Li R, Martinez-Perez R, Carrau RL, Prevedello DM. Suction mask device: a simple, inexpensive, and effective method of reducing spread of aerosolized particles during endoscopic endonasal surgery in the era of COVID-19. J Neurosurg. 2021;135(5):1328-1334.	Nonexperimental	Drilling on cadaver frontotemporal bone and sphenoid bone, clinical laboratory, United States	n/a	n/a	Particle count 12 cm from drilling region	The suction mask device significantly reduced particle aerosolization compared to no suction and with suction during both simulations.	IIIB
122	Jones HAS, Salib RJ, Harries PG. Reducing aerosolized particles and droplet spread in endoscopic sinus surgery during COVID-19. Laryngoscope. 2021;131(5):956-960.	Quasi-experimental	Endoscopic sinus surgery (ESS) using microdebrider and drill on cadaver, laboratory, United Kingdom	Mask with suction	Mask with no suction	Droplet spread (fluorescein); fine nuclei aerosol spread (wood smoke)	Negative-pressure mask resulted in 98% fine particulate aerosol reduction and eliminated the spread of larger particles during powered instrument use.	IIB
123	Gaszyński T, Fedorczak M, Pondel J. A proposal of a cheap and simple method of medical personnel protection for endotracheal intubation of patients with a suspected or confirmed COVID-19 infection. Int J Occup Med Environ Health. 2021;34(2):301-305.	Organizational Experience	Patients undergoing intubation, operating room, university hospital, Poland	n/a	n/a	n/a	A barrier made with disposable material and anesthesia screen frame can prevent spread of aerosol around intubation area in confirmed or suspected COVID-19 patients.	VB
124	Nilson J, Bugaev N, Sekhar P, Hojman H, Gonzalez-Ciccarelli L, Quraishi SA. Portable negative pressure environment to protect staff during aerosol-generating procedures in patients with COVID-19. BMJ Open Respir Res. 2020;7(1):e000653.	Case Report	Patient with COVID-19 undergoing open tracheostomy in OR, medical center, United States	n/a	n/a	n/a	An easy-to-assemble, low-cost, single-use device was developed that enhanced HCP safety during intubation, extubation, and patient transport.	VB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
125	Zago M, Uranues S, Chiarelli ME, et al. Enhancing safety of laparoscopic surgery in COVID-19 era: clinical experience with low-cost filtration devices. Eur J Trauma Emerg Surg. 2020;46(4):731-735.	Organizational Experience	49 patients undergoing laparoscopic surgery with 1 of 2 filter systems, hospitals, Italy and Austria	n/a	n/a	n/a	Two constructed filter systems were effective in evacuation of smoke without affecting laparoscopic visualization. No incident of personnel illness or positive test for COVID-19 have been reported.	VA
126	Zoabi T, Ronen O. A novel technique for protecting staff during microlaryngoscopy procedures. J Laryngol Otol. 2021;135(1):83-85.	Case Report	Microlaryngoscopy procedure, operating room, hospital, Israel	n/a	n/a	n/a	Microscope drape used as a cover for patient head and torso and with binocular holes for surgeon's hands can minimize droplet and aerosal exposure.	VB
127	Temmesfeld MJ, Gorzkowska-Sobas AA, Hedlund K, et al. Surgical helmets can be converted into efficient disinfectable powered air-purifying respirators. Am J Infect Control. 2022;50(6):624-630.	Nonexperimental	Modified surgical helmets worn by volunteers, simulation OR, Norway	n/a	n/a	Total inward leakage; CO_2 concentration; Positive intra-helmet differential pressure	With 3D printed filter adaptor, surgical helmets can be safe, efficient, and disinfectable PAPRs for OR use when caring for patients with droplet and/or airborne infection.	IIIC
128	42 CFR 482.15. Condition of participation: Emergency preparedness. Code of Federal Regulations. Accessed December 19, 2024. https://www.ecfr.gov/current/title-42/chapter-IV/subchapter-G/part-482/subpart-B/section-482.15	Regulatory	n/a	n/a	n/a	n/a	Requirement for developing and maintaining a comprehensive emergency preparedness program to include an emerging infectious disease plan.	n/a
129	R3 Report Issue 41: New and Revised Requirements for Infection Prevention and Control for Critical Access Hospitals and Hospitals. The Joint Commission. Accessed December 19, 2024. https://www.jointcommission.org/standards/r3-report/r3-report-issue-41-new-and-revised-requirements-for-infection-prevention-and-control-for/	Accreditation	n/a	n/a	n/a	n/a	Accrediting body standard for implementation of processes to support preparednes for high-consequence infectious diseases.	n/a
130	Kuhar DT, Carrico R, Cox K, et al. Infection Control in Healthcare Personnel: Infrastructure and Routine Practices for Occupational Infection Prevention and Control Services. Centers for Disease Control and Prevention. 2019. Accessed December 19, 2024. https://www.cdc.gov/infection-control/media/pdfs/Guideline-Infection-Control-HCP-H.pdf	Guideline	n/a	n/a	n/a	n/a	Provides guidance on providing occupational infection prevention and control serves to health care personel.	IVA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
131	Lindsley WG, Beezhold DH, Coyle J, et al. Efficacy of universal masking for source control and personal protection from simulated cough and exhaled aerosols in a room. J Occup Environ Hyg. 2021;18(8):409-422.	Quasi-experimental	Simulated source and receipient of cough or continuous breath, laboratory, United States	Cloth mask	No mask	Mean aerosol concentration at recipient's simulator mouth	Regardless of orientation or distance, when both source and recipient were masked a consistent and significant reduction of aerosol exposure to receipent occurred.	IIB
132	Heffernan DS, Evans HL, Huston JM, et al. Surgical Infection Society guidance for operative and peri-operative care of adult patients infected by the severe acute respiratory syndrome Coronavirus-2 (SARS-CoV-2). Surg Infect (Larchmt). 2020;21(4):301-308.	Consensus	n/a	n/a	n/a	n/a	Provides guidance for care of suspected or confirmed COVID-19 positive patient undergoing urgent or emergent surgery.	IVB
133	Garbey M, Joerger G, Furr S. A systems approach to assess transport and diffusion of hazardous airborne particles in a large surgical suite: potential impacts on viral airborne transmission. Int J Environ Res Public Health. 2020;17(15):5404.	Nonexperimental	Simulation of 3 surgeries with CO_2 emission, large empty OR, United States	n/a	n/a	Pollutant transmission between the OR and hallway	The OR doors showed air leaks, contributing to transport of particles throughout OR suite. The effect of door opening on particle transport depends on door motion and temperature difference between room and hallway.	IIIB
134	Evans HL, Thomas CS, Bell LH, et al. Development of a sterile personal protective equipment donning and doffing procedure to protect surgical teams from SARS-CoV-2 exposure during the COVID-19 pandemic. Surg Infect (Larchmt). 2020;21(8):671-676.	Organizational Experience	2 surgeons, 1 anesthesioligist, 1 infection preventionist, university hospital, United States	n/a	n/a	n/a	A 1-page checklist with corresponding pictures, laminated posters and video for donning and doffing of PPE can contribute to personnel and patient safety.	VB
135	Muret-Wagstaff SL, Collins JS, Mashman DL, et al. In situ simulation enables operating room agility in the COVID-19 pandemic. Ann Surg. 2020;272(2):e148-e150.	Organizational Experience	Interdiscplinary team (surgery, anesthesia, nursing), university hospital, United States	n/a	n/a	n/a	Through an iterative, collaborative approach integrating in situ simulation and rapid cycle quality improvement , processes were outlined for care of the COVID-19-positive patient in the OR.	VA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
136	Theodorou C, Simpson GS, Walsh CJ. Theatre ventilation. Ann R Coll Surg Engl. 2021;103(3):151-154.	Literature Review	n/a	n/a	n/a	n/a	Limited evidence found for conversion of ORs to negative pressure ventilation to minimize viral exposure of perioperative team members. However, a dedicated negative pressure room or unit for AGPs and high risk patients may be beneficial.	VB
137	Park J, Yoo SY, Ko JH, et al. Infection prevention measures for surgical procedures during a Middle East respiratory syndrome outbreak in a tertiary care hospital in South Korea. Sci Rep. 2020;10(1):325.	Organizational Experience	6 MERS-related patients (4 exposed, 2 confirmed) undergoing emergency surgery, tertiary care hospital, South Korea	n/a	n/a	n/a	Temporary negative-pressure operating rooms with separate ventilation and controls, along with MERS infection prevention guidelines resulted in no adverse events or perioperative transmission.	VA
138	Kennedy C, Doyle NM, Pedigo R, Toy S, Stoner A. A novel approach to operating room readiness for airborne precautions using simulation-based clinical systems testing. Paediatr Anaesth. 2022;32(3):462-470.	Nonexperimental	14 anesthesia professionals, simulated children's hospital OR, United States	n/a	n/a	Latent safety threats; feasibility and utlity of approach	17 safety threats identified which were used to correct protocol. Participants felt program worth time. At 4-month follow-up 57% of participants were using protocol.	IIIB
139	Bolyard EA, Tablan OC, Williams WW, Pearson ML, Shapiro CN, Deitchman SD. Guideline for infection control in health care personnel, 1998. Hospital Infection Control Practices Advisory Committee. Infect Control Hosp Epidemiol. 1998;19(6):407-463.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for prevention of infections in health care personnel	IVA
140	Kuhar DT, Babcock H, Mays Brown V, et al. Infection Control in Healthcare Personnel: Epidemiology and Control of Selected Infections Transmitted Among Healthcare Personnel and Patients. Diphtheria, Group A Streptococcus, Measles, Meningococcal Disease, Mumps, Pertussis, Rabies, Rubella, Varicella, and Special Populations: Pregnant Healthcare Personnel. Centers for Disease Control and Prevention. March 28, 2024. Accessed December 19, 2024. https://www.cdc.gov/infection-control/media/pdfs/Guideline-IC-HCP-H.pdf	Guideline	n/a	n/a	n/a	n/a	Guidance on management and control of exposed or potentially infectious HCP for 10 listed infections.	IVA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
141	Danzmann L, Gastmeier P, Schwab F, Vonberg RP. Health care workers causing large nosocomial outbreaks: a systematic review. BMC Infect Dis. 2013;13:98.	Systematic Review	1,449 patients in 152 outbreaks caused by health care workers/ International (mainly US, UK, France), 1958-2006	n/a	n/a	n/a	Outbreaks cause by health care workers are rare (<10%); screening of personnel should not be performed regularly. Awareness of carrier status significantly decreased the risk of causing large outbreaks; if certain species of microorganisms (e.g. S. aureus, HBV, S. pyogenes) are involved, the possibility of a carrier should be taken into account.	IIIA
142	Sosa LE, Njie GJ, Lobato MN, et al. Tuberculosis screening, testing, and treatment of U.S. health care personnel: recommendations from the National Tuberculosis Controllers Association and CDC, 2019. MMWR Morb Mortal Wkly Rep. 2019;68(19):439-443.	Consensus	n/a	n/a	n/a	n/a	Provides guidance on the screening, testing, and treatment for tuberculosis of health care personnel for tuberculosis.	IVB
143	Advisory Committee on Immunization Practices; Centers for Disease Control and Prevention (CDC). Immunization of health-care personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2011;60(RR-7):1-45.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for immunization of health care workers.	IVA
144	Liang JL, Tiwari T, Moro P, et al. Prevention of pertussis, tetanus, and diphtheria with vaccines in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2018;67(2):1-44.	Consensus	n/a	n/a	n/a	n/a	Recommendations for prevention and control of tetanus, diptheria, and pertussis in the United States.	IVC
145	Havers FP, Moro PL, Hunter P, Hariri S, Bernstein H. Use of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccines: updated recommendations of the Advisory Committee on Immunization Practices – United States, 2019. MMWR Morb Mortal Wkly Rep. 2020;69(3):77-83.	Consensus	n/a	n/a	n/a	n/a	Update on recommendations for prevention and control of tetanus, diptheria, and pertussis in the United States.	IVC
146	Derkay CH. Occupational exposure to human papilloma virus (HPV) and prophylactic vaccination. ClinicalTrials.gov. Accessed December 19, 2024. https://clinicaltrials.gov/study/NCT03350698	Regulatory	n/a	n/a	n/a	n/a	Clinical trial registry investigating occupational HPV vaccination.	n/a

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
147	2024 SPS Annual Meeting highlights. American Medical Association. November 15, 2024. Accessed December 19, 2024. https://www.ama-assn.org/member-groups-sections/senior-physicians/2024-sps-annual-meeting-highlights	Consensus	n/a	n/a	n/a	n/a	Report of actions taken by the American Medical Association House of Delegates at the 2024 Annual Meeting on proposed recommendations.	IVC
148	Kang J, Kim EJ, Choi JH, et al. Minimizing contamination in the use of personal protective equipment: simulation results through tracking contamination and enhanced protocols. Am J Infect Control. 2021;49(6):713-720.	Nonexperimental	30 volunteer health care workers donning/doffing PPE, simulation lab, Korea	n/a	n/a	Areas of body contamination after 1 minute of simulated patient care using fluorescent powder and ultraviolet lamps; Perceived barriers to compliance	With identical PPE kits, significant reduction in doffing occurred wih the enhanced protocol compared to simple method.	IIIB
149	Chasco EE, Pereira da Silva J, Dukes K, et al. Unfamiliar personal protective equipment: the role of routine practice and other factors affecting healthcare personnel doffing strategies. Infect Control Hosp Epidemiol. 2023;44; 2023/04/12(12):1979-1986.	Qualitative	Four doffing simulations of PPE by 70 HCP, 2 university hospitals, United States	n/a	n/a	Open-ended questions on doffing approach and thoughts at each step of process	Different PPE designs may not be interchangeable and their use may not be intuitive. HCP used their routine practices, experience with familiar PPE, and training to adapt.	IIIB
150	Herron JBT, Kuht JA, Hussain AZ, Gens KK, Gilliam AD. Do theatre staff use face masks in accordance with the manufacturers' guidelines of use? J Infect Prev. 2019;20(2):99-106.	Nonexperimental	1034 scrubbed personnel, 9 hospitals, United Kingdom	n/a	n/a	Surgical face mask application according to CDC guidelines	Full guideline compliance only noted in 18% of staff (190/1034). Staff were not aware of exisitng CDC guidelines for mask donning.	IIIA
151	Neo F, Edward KL, Mills C. Current evidence regarding non-compliance with personal protective equipment – an integrative review to illuminate implications for nursing practice. J Perioper Nurs Aust. 2012;25(4):22-30.	Literature Review	n/a	n/a	n/a	n/a	Implications for clinical practice include the promotion of an environment that fosters teamwork and PPE use, continued commitment from managers to ensure availability and access of equipment, and the provision of sustainable in-service education related to PPE and standard precautions.	VB

AORN SAFE SURGERY TOGETHER

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
152	Phan LT, Maita D, Mortiz DC, et al. Personal protective equipment doffing practices of healthcare workers. J Occup Environ Hyg. 2019;16(8):575-581.	Nonexperimental	162 observations of HCP caring for 52 patients with viral respiratory infections, 9 hospital units, United States	n/a	n/a	Compliance with wearing correct PPE and removal practices	90% of observed practices were incorrect, indicating a need to change the approach to HCP training on removal practices.	IIIA
153	Verbeek JH, Rajamaki B, Ijaz S, et al. Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff. Cochrane Database Syst Rev. 2020;4(4):CD011621.	Systematic Review	n/a	n/a	n/a	n/a	It is unclear which type of PPE protects best, what is the best way to remove PPE, and how to make sure HCP use PPE as instructed.	IIA
154	Baloh J, Reisinger HS, Dukes K, et al. Healthcare workers' strategies for doffing personal protective equipment. Clin Infect Dis. 2019;69(Suppl 3):S192-S198.	Qualitative	Doffing of PPE by 30 HCP, medical and nursing students, simulation lab, United States	n/a	n/a	Open-ended questions on doffing approach and thoughts at each step of process	Doffing strategies included doffing safely, expediently, or improvising based on prior experience or similar PPE design. PPE design, glasses and long hair identifed as barriers.	IIIB
155	Tomas ME, Cadnum JL, Mana TS, et al. Utility of a novel reflective marker visualized by flash photography for assessment of personnel contamination during removal of personal protective equipment. Infect Control Hosp Epidemiol. 2016;37(6):711-713.	Quasi-experimental	50 simulations/ Laboratory, United States	Novel reflective marker visualized using flash photography	Bacteriophage MS2	Contamination of hands and/or wrists with the reflective marker and with bacteriophage MS2	A novel reflective marker visualized using flash photography could be a useful tool to visualize and document personnel contamination during PPE removal.	IIC
156	Drew JL, Turner J, Mugele J, et al. Beating the spread: developing a simulation analog for contagious body fluids. Simul Healthc. 2016;11(2):100-105.	Quasi-experimental	3 simulations with computerized mannequins/ Laboratory, United States	UV tracer to simulate contamination	No tracer	Spread of UV tracer	The UV tracer seems to be a useful analog of contaminated bodily fluids because it spread easily and its spread decreased with the use of barrier methods. This model could be used in future studies to measure the effectiveness of different forms of PPE and to study the effectiveness of provider education on appropriately donning and doffing PPE.	IIB

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
157	Frauenfelder C, Hall A, Walsh B, et al. Use of simulation to visualize healthcare worker exposure to aerosol in the operating room. Simul Healthc. 2022;17(1):66-67.	Organizational Experience	Simulation of airway manipulation on child mannequin, children's OR, United Kingdom	n/a	n/a	n/a	Video recordings of aerosol-generating procedures demonstrated aerosol dispersion and potential health care worker exposure, emphasizing the need for correct PPE.	VB
158	Muhsen WS, Marshall-Roberts R. Simulation-guided preparations for the management of suspected or confirmed COVID-19 cases in the obstetric emergency theater. J Matern Fetal Neonatal Med. 2022;35(9):1801-1804.	Organizational Experience	Neonatal, maternity, and anesthesia health care workers undergoing simulation training, university hospital, United Kingdom	n/a	n/a	n/a	3 different simulations identified areas needed to enhance staff performance that included floor plan adjustment, communication, staffing, and development of neonatal care pathway.	VB
159	Soma M, Jacobson I, Brewer J, Blondin A, Davidson G, Singham S. Operative team checklist for aerosol generating procedures to minimise exposure of healthcare workers to SARS-CoV-2. Int J Pediatr Otorhinolaryngol. 2020;134:110075.	Case Report	Otolaryngologist, anesthetists, and nursing staff, children's hospital, Australia	n/a	n/a	n/a	An operative team checklist that details all phases of care when caring for confirmed or suspected COVID-19 patients can help perioperative personnel reduce transmission and provide focus during high-risk AGPs.	VA
160	Wu Q, Jiang HJ, Chen HQ. Establishment of infection prevention and control strategy in nursing managements during surgical operations in COVID-19 patients based on Delphi method. Nurs Open. 2023;10(6):3906-3913.	Qualitative	34 nursing and physician professionals with 5-10 experience , university hospital, China	n/a	n/a	Importance, member variation, and expert opinions of proposed COVID-19 infection control strategies	Consensus on 34-item infection prevention and control protocol for COVID-19 patient undergoing surgery. The Delphi method can be used to provide scientific guidance for clinical staff.	IIIA
161	Prakash G, Shetty P, Thiagarajan S, et al. Compliance and perception about personal protective equipment among health care workers involved in the surgery of COVID-19 negative cancer patients during the pandemic. J Surg Oncol. 2020;122(6):1013-1019.	Nonexperimental	Health care workers participating in 183 surgeries, hospital, India	n/a	n/a	PPE compliance; Reasons for noncompliance	A 96.3% compliance with PPE was found, with eye protection having the greatest noncompliance (45/567). Discomfort, poor visibility, and frequent fogging identified as reasons for not using eye protection.	IIIA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
162	Herlihey TA, Gelmi S, Flewwelling CJ, et al. Personal protective equipment for infectious disease preparedness: a human factors evaluation. Infect Control Hosp Epidemiol. 2016;37(9):1022-1028.	Nonexperimental	82 health care workers/ Canada	n/a	n/a	PPE Usability testing, Participant feedback	Healthcare institutions are encouraged to use human factors methods to identify risk and failure points with the usage of their selected PPE, and to modify on the basis of iterative evaluations with representative end users.	IIIB
163	Krein SL, Mayer J, Harrod M, et al. Identification and characterization of failures in infectious agent transmission precaution practices in hospitals: a qualitative study. JAMA Intern Med. 2018;178(8):1016-1057.	Nonexperimental	325 observations inside and outside of patient rooms on contact and droplet precautions, 2 hospitals, United States	n/a	n/a	Number and type of transmission-based precaution failures	283 failures in PPE use and transmission-based precautions were observed, including 102 violations (deviations from safe operating practices or procedures),144 process or procedural mistakes (failures of intention), and 37 slips (failures of execution).	IIIB
164	Phan LT, Sweeney D, Maita D, et al. Respiratory viruses on personal protective equipment and bodies of healthcare workers. Infect Control Hosp Epidemiol. 2019;40(12):1356-1360.	Nonexperimental	59 health care workers caring for patients with viral respiratory infections during a 3-hour period, academic hospital, United States	n/a	n/a	Virus presence on PPE, hand, face, and scrubs; Observed self-contact during patient encounter	Contamination with respiratory virus after patient care occurs routinely indicating need for hand hygiene and PPE to prevent virus dissemination. Modification of self-contact behaviors may decrease presence of virus on HCP.	IIIB
165	Zimmerman PA, Byrne JH, Gillespie BM, Macbeth D. Investigation of the selection and use of “other” personal protective equipment to prevent mucous membrane exposure in nurses: a cross-sectional study. Infect Dis Health. 2023;28(3):211-220.	Qualitative	Survey completed by 165 nurses on 3 high-risk units (ER, ICU, Renal) university hospital, Austrailia	n/a	n/a	Compliance with Standard Precautions Scale (CSPS); Factors Influencing Adherence to Standard Precautions Scale (FIASPS)	Selection and use of PPE for standard precautions is inadequate, although knowledge on need for performance of a risk assessment is present. Differences were found in safety culture between units.	IIIA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
166	Kang J, O'Donnell JM, Colaianne B, Bircher N, Ren D, Smith KJ. Use of personal protective equipment among health care personnel: results of clinical observations and simulations. Am J Infect Control. 2017;45(1):17-23.	Nonexperimental	130 sessions with 65 health care personnel/ Academic medical center, United States	n/a	n/a	Contamination when doffing PPE, Survey questions about PPE use	PPE contamination occurred in 79.2% of the simulations. Health care personnel reported that PPE use was time consuming and cumbersome, and reported concerns about PPE effectiveness.	IIIB
167	Figi CE, Herstein JJ, Beam EL, et al. Literature review of physiological strain of personal protective equipment on personnel in the high-consequence infectious disease isolation environment. Am J Infect Control. 2023;51(12):1384-1391.	Literature Review	n/a	n/a	n/a	n/a	PPE limits the natural physiological cooling process and can induce heat strain and cognitive impairment. Innovation in PPE engineering is necessay to allow cooling and improve well-being.	VB
168	Hampton T, Sharma S, Dunham M, Okonkwo I. We still cannot hear: staff perceptions of personal protective equipment impact on speech and communication in the operating theater during pediatric airway surgery. Paediatr Anaesth. 2021;31(4):494-496.	Qualitative	Perioperative staff involved in pediatric airway surgery, Children's Hospital, United Kindgom	n/a	n/a	The understanding of others who wore AGP PPE (filtering facepiece respirator or hood, eye protection); being understood while wearing AGP PPE	All respondents had difficulty understanding others and being understood by others (25/25). Eight staff said PAPRs had worse impact than masks and visors.	IIIB
169	Hampton T, Crunkhorn R, Lowe N, et al. The negative impact of wearing personal protective equipment on communication during coronavirus disease 2019. J Laryngol Otol. 2020;134(7):577-581.	Quasi-experimental	5 volunteer health care workers, one researcher, 4 different background noise levels, simulation lab , United Kingdom	1. No PPE, normal voice level 2. PPE (fit-tested filtering facepiece mask, head visor), normal voice level 3. PPE (fit-tested filtering facepiece mask, head visor), raised voice level	n/a	Interpretation of speech recognition using Bamford-Kowal-Bench testing.	Significant difference in speech discrimination between normal and PPE wearing participants in OR simulated background noise. Researchers concluded that this can result in reduced staff understanding and conventional communication.	IIC
170	Nguyen DL, Kay-Rivest E, Tewfik MA, Hier M, Lehmann A. Association of in-ear device use with communication quality among individuals wearing personal protective equipment in a simulated operating room. JAMA Netw Open. 2021;4(4):e216857.	Nonexperimental	12 surgical residents donning 3 different facial respirators, simulated OR, Canada	n/a	n/a	Speech intelligibility and listening effort with and without an in-ear radio device	The in-ear device was associated with improved communication and decreased listening effort when used with half-face elastomeric respirator and PAPR.	IIIC

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
171	Drysdale HRE, Downie E, Lau S, et al. Did operating theatre staff understand the COVID-19 guidelines for surgery during Victoria's second wave? ANZ J Surg. 2021;91(4):515-518.	Qualitative	188 perioperative personnel, 3 hospitals, Australia	n/a	n/a	Knowledge of PPE requirements	Actions to improve sdherence to new protocols included making information shared consistent between facilities, conveying in weekly communication, displaying in posters, and reviewing at start of shift.	IIIA
172	Karels EM, Voss J, Arends R, Horsley L, Andree E. Impact of infection control education on gastrointestinal endoscopy procedural staff. Gastroenterol Nurs. 2022;45(2):91-100.	Organizational Experience	32 HCP, GI endoscopy suite, hospital, United States	n/a	n/a	Knowledge, skills, and attitudes (KSA) of HCP before and after hands-on education regarding PPE donning and doffing	10.88% increase noted in attitude and knowledge scores. RN & MDs showed a positive improvement when observed, but technicians remained relatively the same.	VC
173	Trivedi KK, Schaffzin JK, Deloney VM, et al. Implementing strategies to prevent infections in acute-care settings. Infect Control Hosp Epidemiol. 2023;44(8):1232-1246.	Consensus	n/a	n/a	n/a	n/a	Provides concepts, frameworks, and models relevant to implementation of prevention and control of health care associated infection.	IVA
174	Johnson CT, Hessels AJ. Associations between negative patient safety climate and infection prevention practices. Am J Infect Control. 2024;52(9):1102-1104.	Qualitative	Direct care nurses, 13 hospitals, United States	n/a	n/a	Survey of patient safety climate and self-reported Standard Precautions (SP) adherence; observation of SP adherence	Negative perceptions of safety climate are correlated with lower levels of observed SP performance.	IIIA
175	Guideline for team communication. In: Guidelines for Perioperative Practice. Denver, CO: AORN, Inc; 2025:1143-1178.	Guideline	n/a	n/a	n/a	n/a	This document provides guidance for improving perioperative team communication through a culture of safety that incorporates team training, simulation training, standardized transfer of patient information (commonly referred to as hand overs or hand offs), briefings, time outs, surgical safety checklists, and debriefings.	IVA

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
176	Moore C, Edward KL, King K, Giandinoto JA. Using the team to reduce risk of blood and body fluid exposure in the perioperative setting. ORNAC J. 2015;33(4):37-46, 28-36.	Quasi-experimental	31 completed surveys from RNs/ Private hospital, Australia	Educational program	No education provided	Survey questions regarding PPE use	Team support and good leadership were identified as essential to ongoing professional knowledge and support with regards to risk minimization in the perioperative setting. The findings of this study suggest leadership was essential to PPE compliance enhancement.	IIC
177	21 CFR 803. Medical Device Reporting. Code of Federal Regulations. Accessed December 19, 2024. https://www.ecfr.gov/current/title-21/chapter-I/subchapter-H/part-803	Regulatory	n/a	n/a	n/a	n/a	Requirements for medical device reporting.	n/a
178	MAUDE: Manufacturer and User Facility Device Experience. US Food and Drug Administration. Accessed December 19, 2024. https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfMAUDE/search.CFM	Regulatory	n/a	n/a	n/a	n/a	FDA MAUDE database.	n/a
179	Medical Device Reporting (MDR): How to Report Medical Device Problems. US Food and Drug Administration. Accessed December 19, 2024. https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems	Regulatory	n/a	n/a	n/a	n/a	Requirements for medical device reporting.	n/a
180	Exhibit 351: Ambulatory Surgical Center (ASC) Infection Control Surveyor Worksheet. Rev 206; 06-21-22. Centers for Medicare and Medicaid Services. Accessed December 19, 2024. https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107_exhibit_351.pdf	Regulatory	n/a	n/a	n/a	n/a	CMS surveyor worksheet that lists items to be assessed during the on-site visit.	n/a
181	416.51(b)(3). In: State Operations Manual Appendix L – Guidance for Surveyors: Ambulatory Surgical Centers. Rev. 215, 07-21-23. Centers for Medicare and Medicaid Services. Accessed December 19, 2024. https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107ap_l_ambulatory.pdf	Regulatory	n/a	n/a	n/a	n/a	Requirements for Infection Control in an ASC	n/a

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
182	416.51(b)(1). In: State Operations Manual Appendix L – Guidance for Surveyors: Ambulatory Surgical Centers. Rev 215, 07-21-23. Centers for Medicare and Medicaid Services. Accessed December 19, 2024. https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107ap_l_ambulatory.pdf	Regulatory	n/a	n/a	n/a	n/a	Requirements for Infection Control in an ASC	n/a