

AORN Guideline for Laser Safety
Evidence Table

REFERENCE #	CITATION	EVIDENCE TYPE	SAMPLE SIZE/ POPULATION	INTERVENTION(S)	CONTROL/ COMPARISON	OUTCOME MEASURE(S)	CONCLUSION(S)	CONSENSUS SCORE
1	American National Standards Institute; Laser Institute of America. ANSI Z136.3-2018: American National Standard for Safe Use of Lasers in Health Care. Orlando, FL: Laser Institute of America; 2018.	Consensus	n/a	n/a	n/a	n/a	Provides guidance for the use of medical lasers.	IVC
2	Ripley PM. The physics of diode lasers. Laser Med Sci. 1996;11(2):71-78.	Expert Opinion	n/a	n/a	n/a	n/a	Provides general information about Diode laser	VC
3	Müller A, Marschall S, Jensen OB, et al. Diode laser based light sources for biomedical applications. Laser & Photonics Reviews. 2013;7(5):605-627.	Expert Opinion	n/a	n/a	n/a	n/a	Provides general information about Diode lasers.	VC
4	Mary S. Laser safety: practical measures and latest legislative requirements. J Perioper Pract. 2011;21(9):299-303.	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance for the use of medical lasers.	VB
5	Appendix B: Lasers used in medicine and surgery. In: American National Standards Institute; Laser Institute of America. ANSI Z136.3-2018: American National Standard for Safe Use of Lasers in Health Care. Orlando, FL: Laser Institute of America; 2018:54-60	Expert Opinion	n/a	n/a	n/a	n/a	Provides descriptions of the various types of lasers and their uses.	VC
6	Section III: Chapter 6. Laser hazards. In: OSHA Technical Manual. Occupational Safety and Health Administration. https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_6.html . Accessed March 31, 2020.	Expert Opinion	n/a	n/a	n/a	n/a	A supplement the regulations.	VB
7	Sankaranarayanan G, Resapu RR, Jones DB, Schwaitzberg S, De S. Common uses and cited complications of energy in surgery. Surg Endosc. 2013;27(9):3056-3072.	Literature Review	n/a	n/a	n/a	n/a	Provides information regarding the complications and uses of lasers.	VA
8	Appendix D: Use of lasers in specialties. In: American National Standards Institute; Laser Institute of America. ANSI Z136.3-2018: American National Standard for Safe Use of Lasers in Health Care. Orlando, FL: Laser Institute of America; 2018:72-103	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance for safety precautions by specialty and for documentation.	VC
9	Laser use and safety. ECRI Institute. https://www.ecri.org/components/HRC/Pages/SurgAn17.aspx . Published September 26, 2017. Accessed March 31, 2020.	Expert Opinion	n/a	n/a	n/a	n/a	Provides general guidance on laser safety techniques and procedures	VB
10	Vano-Galvan S, Jaen P. Complications of nonphysician-supervised laser hair removal: case report and literature review. Can Fam Physician. 2009;55(1):50-52.	Case Report	n/a	n/a	n/a	n/a	Laser treatments in dermatological settings can result in various side effects.	VB
11	Plauntz L. Guidelines for staff administering laser therapy in an office setting. Plast Surg Nurs. 2013;33(1):29-35.	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance on the education of personnel involved in laser procedures and documentation.	VA

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12	De Felice E. Shedding light: laser physics and mechanism of action. <i>Phlebology</i> . 2010;25(1):11-28.	Expert Opinion	n/a	n/a	n/a	n/a	Summarizes training required and laser precautions.	VB
13	Technology background: surgical lasers. ECRI Institute. https://www.ecri.org/components/HDJournal/Pages/Tech-Background-Surgical-Lasers.aspx# . Published November 30, 2016. Accessed March 31, 2020.	Expert Opinion	n/a	n/a	n/a	n/a	Summary of procedures to perform for safe use of a laser.	VC
14	Jacques SL. Laser-tissue interactions: photochemical, photothermal, and photomechanical. <i>Surg Clin North Am</i> . 1992;72(3):531-558.	Expert Opinion	n/a	n/a	n/a	n/a	Provides definitions of laser-tissue interactions.	VB
15	Bahammam MA. Treatment of a gingival injury from a cosmetic laser burn: a case report. <i>Compend Contin Educ Dent</i> . 2018;39(4):238-243.	Case Report	n/a	n/a	n/a	n/a	Describes a case of a gingival burn	VB
16	Zhang AY, Obagi S. Diagnosis and management of skin resurfacing-related complications. <i>Oral Maxillofac Surg Clin North Am</i> . 2009;21(1):1-12.	Expert Opinion	n/a	n/a	n/a	n/a	Listing of the side effects of dermatological laser treatment.	VB
17	Yan Y, Olszewski AE, Hoffman MR, et al. Use of lasers in laryngeal surgery. <i>J Voice</i> . 2010;24(1):102-109.	Literature Review	n/a	n/a	n/a	n/a	Staff must be educated on laser hazards and prevention, use moist packs around the endotracheal tube and keep them moist. Use a shield as a supplement. Use the highest power for the shortest amount of time.	VB
18	Cao LY, Taylor JS, Vidimos A. Patient safety in dermatology: a review of the literature. <i>Dermatol Online J</i> . 2010;16(1):3.	Literature Review	n/a	n/a	n/a	n/a	Summarizes many of the safety precautions to take during use of a laser	VA
19	Srinivas CR, Kumaresan M. Lasers for vascular lesions: standard guidelines of care. <i>Indian J Dermatol Venereol Leprol</i> . 2011;77(3):349-368.	Guideline	n/a	n/a	n/a	n/a	Guidance on the education required for working with lasers and associated	IVC
20	Tremaine AM, Avram MM. FDA MAUDE data on complications with lasers, light sources, and energy-based devices. <i>Lasers Surg Med</i> . 2015;47(2):133-140.	Literature Review	n/a	n/a	n/a	n/a	Review of the MAUDE database for events related to the dermatological setting including lasers and electrosurgical devices	VA
21	Zelickson Z, Schram S, Zelickson B. Complications in cosmetic laser surgery: a review of 494 Food and Drug Administration Manufacturer and User Facility Device Experience reports. <i>Dermatol Surg</i> . 2014;40(4):378-382	Expert Opinion	n/a	n/a	n/a	n/a	Perform a time out. There were 494 laser connected adverse event in the Maude Data Base between 2006-2007.	VB

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22	Dudelzak J, Goldberg DJ. Laser safety. <i>Curr Probl Dermatol</i> . 2011;42:35-39.	Expert Opinion	n/a	n/a	n/a	n/a	Summarizes precautions to take to prevent injury from laser use.	VC
23	Best C. Anesthesia for laser surgery of the airway in children. <i>Paediatr Anaesth</i> . 2009;19(Suppl 1):155-165.	Expert Opinion	n/a	n/a	n/a	n/a	Describes effect of lasers, and safety precautions.	VB
24	Pierce JS, Lacey SE, Lippert JF, Lopez R, Franke JE, Colvard MD. An assessment of the occupational hazards related to medical lasers. <i>J Occup Environ Med</i> . 2011;53(11):1302-1309.	Literature Review	n/a	n/a	n/a	n/a	Protective eyewear should be worn.	VA
25	American National Standards Institute; Laser Institute of America. ANSI Z136.1: American National Standard for Safe Use of Lasers. Orlando, FL: Laser Institute of America; 2014.	Consensus	n/a	n/a	n/a	n/a	Provides guidance for the use of lasers	IVC
26	Barkana Y, Belkin M. Laser eye injuries. <i>Surv Ophthalmol</i> . 2000;44(6):459-478.	Literature Review	n/a	n/a	n/a	n/a	The type of injury will vary based on the type of laser and the injury usually occurs to the eye.	VB
27	Wöllmer W, Schade G, Kessler G. Endotracheal tube fires still happen—a short overview. <i>Med Laser Appl</i> . 2010;25(2):118-125.	Case Report	n/a	n/a	n/a	n/a	Report of three endotracheal tube fires.	VA
28	Smith LP, Roy S. Operating room fires in otolaryngology: risk factors and prevention. <i>Am J Otolaryngol</i> . 2011;32(2):109-114.	Qualitative	8523 members of the American Academy of Otolaryngology—Head and Neck Surgery	n/a	n/a	Frequency of OR fires	Out of 349 responses to a survey, 88 surgeons experienced an OR fire. Lasers were a source of ignition	IIIB
29	Mehta SP, Bhananker SM, Posner KL, Domino KB. Operating room fires: a closed claims analysis. <i>Anesthesiology</i> . 2013;118(5):1133-1139.	Case Report	103 Surgical fire closed claims	n/a	n/a	n/a	Lasers were found to be the ignition source in 9 of the claims.	VB
30	Guideline for a safe environment of care. In: <i>Guidelines for Perioperative Practice</i> . Denver, CO: AORN, Inc; 2020:115-150.	Guideline	n/a	n/a	n/a	n/a	Provides general fire safety guidance.	IVA
31	Guideline for surgical smoke safety. In: <i>Guidelines for Perioperative Practice</i> . Denver, CO: AORN, Inc; 2020:1007-1038.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for removing surgical smoke.	IVA
32	29 CFR 1926—Safety and health regulations for construction. <i>Electronic Code of Federal Regulations</i> . https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=63ef827aff4a5dca23aaedc7e9e8aa1&ty=HTML&h=L&mc=true&n=pt29.8.1926&r=PART . Accessed March 31, 2020.	Regulatory	n/a	n/a	n/a	n/a	Requirement for sign posting.	n/a
33	Smalley PJ. Laser safety: risks, hazards, and control measures. <i>Laser Ther</i> . 2011;20(2):95-106.	Expert Opinion	n/a	n/a	n/a	n/a	Summary of precautions to take with the use of lasers	VB
34	Thomas G, Isaacs R. Basic principles of lasers. <i>Anaesth Intensive Care Med</i> . 2011;12(12):574-577.	Expert Opinion	n/a	n/a	n/a	n/a	Outlines the precautions to be taken when using a laser	VC

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35	Dhepe N. Minimum standard guidelines of care on requirements for setting up a laser room. Indian J Dermatol Venereol Leprol. 2009;75(Suppl S2):101-110.	Guideline	n/a	n/a	n/a	n/a	Provide guidance for setting up a laser room and precautions to take during laser use.	IVC
36	AST Standards of Practice for Laser Safety. Littleton, CO: Association of Surgical Technologists; 2019.	Guideline	n/a	n/a	n/a	n/a	Overall guideline for handling lasers for the surgical technologist	IVC
37	Adelman MR, Tsai LJ, Tangchitnob EP, Kahn BS. Laser technology and applications in gynaecology. J Obstet Gynaecol. 2013;33(3):225-231.	Expert Opinion	n/a	n/a	n/a	n/a	Provides general safety precautions for use during procedures involving lasers	VC
38	Dhar P, Malik A. Anesthesia for laser surgery in ENT and the various ventilatory techniques. Trends in Anaesthesia and Critical Care. 2011;1(2):60-66.	Expert Opinion	n/a	n/a	n/a	n/a	Provides recommendations for use of a laser in ENT surgery	VB
39	Seifert PC, Peterson E, Graham K. Crisis management of fire in the OR. AORN J. 2015;101(2):250-263.	Expert Opinion	n/a	n/a	n/a	n/a	Describes actions to take to prevent and fight an OR fire	VA
40	Kaneko S. Safety guidelines for diagnostic and therapeutic laser applications in the neurosurgical field. Laser Ther. 2012;21(2):129-136.	Guideline	n/a	n/a	n/a	n/a	Japanese guidelines for use of laser	IVC
41	National Fire Protection Association Technical Committee on Laser Fire Protection. NFPA 115: Standard for Laser Fire Protection. Quincy, MA: NFPA; 2020.	Guideline	n/a	n/a	n/a	n/a	Provides guidance on prevention of fires related to laser use.	IVC
42	Fukuda TY, Jesus JF, Santos MG, Cazarini Junior C, Tanji MM, Plapler H. Calibration of low-level laser therapy equipment. Rev Bras Fisioter. 2010;14(4):303-308.	Nonexperimental	60 devices	n/a	n/a	Real average power	Lasers should be calibrated because the power delivered can become inaccurate.	IIIB
43	Grant DG, Tierney PA, Hinni ML. Custom thermoplastic mouth guard for endoscopic laser surgery. Clin Otolaryngol. 2009;34(5):499-500.	Case Report	n/a	n/a	n/a	n/a	Describes one type of tooth protector.	VC
44	Alidina S, Hur HC, Berry WR, et al. Narrative feedback from OR personnel about the safety of their surgical practice before and after a surgical safety checklist intervention. Int J Qual Health Care. 2017;29(4):461-469.	Qualitative	54 respondents before and 50 after. Respondents came from 11 facilities.	n/a	n/a	Opinion of the respondents on improvements after instituting a Surgery Safety Checklist.	The surgery safety checklist helped decrease surgical complications and averted other problems.	IIIB
45	29 CFR 1910.133 - Eye and face protection. Occupational Safety and Health Administration. https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.133 . Accessed March 31, 2020.	Regulatory	n/a	n/a	n/a	n/a	Law covering wearing of PPE	n/a

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46	29 CFR 1910.132 - General requirements. Occupational Safety and Health Administration. https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.132 . Accessed March 31, 2020.	Regulatory	n/a	n/a	n/a	n/a	Law covering general PPE requirements	n/a
47	Kontadakis GA, Karagiannis D, Kandarakis AS. Macular injury with rapid onset of choroidal neovascularization from laser epilation. JAMA Ophthalmol. 2015;133(4):488-490.	Case Report	n/a	n/a	n/a	n/a	The laser fires at a rate that is faster than the blink reflex.	VB
48	Paulausky C. Laser safety: the eyes have it! Occup Health Saf. 2014;83(8):10-12	Expert Opinion	n/a	n/a	n/a	n/a	Protective eyewear should be worn.	VC
49	Thach AB, Lopez PF, Snady-McCoy LC, Golub BM, Frambach DA. Accidental Nd:YAG laser injuries to the macula. Am J Ophthalmol. 1995;119(6):767-773.	Case Report	n/a	n/a	n/a	n/a	Eye injury location varies with the type of laser	VB
50	Lin LT, Liang CM, Chiang SY, Yang HM, Chang CJ. Traumatic macular hole secondary to a Q-switch alexandrite laser. Retina. 2005;25(5):662-665.	Case Report	n/a	n/a	n/a	n/a	Damage to the eye is different with different types of lasers.	VB
51	van As G. The diode laser—the importance of laser eye safety. Dent Today. 2011;30(6):128.	Expert Opinion	n/a	n/a	n/a	n/a	Lists responsibilities of the LSO and eye protection requirements for a dental setting.	VC
52	Guidelines for office-based laser procedures. American Society for Laser Medicine and Surgery, Inc. https://www.aslms.org/professionals/professional-resources/standards-of-practice/guidelines-for-office-based-laser-procedures . Published August 2, 2012. Accessed March 31, 2020.	Guideline	n/a	n/a	n/a	n/a	Guideline for office based laser procedures including education and PPE	IVC
53	Minkis K, Whittington A, Alam M. Dermatologic surgery emergencies: complications caused by systemic reactions, high-energy systems, and trauma. J Am Acad Dermatol. 2016;75(2):265-284.	Expert Opinion	n/a	n/a	n/a	n/a	Overall guidance for laser use.	VB
54	Althunayan AM, Elkoushy MA, Elhilali MM, Andonian S. Adverse events resulting from lasers used in urology. J Endourol. 2014;28(2):256-260.	Literature Review	n/a	n/a	n/a	n/a	Recommends use of eye wear during urological laser procedures and provides data on the frequency of adverse events.	VC

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55	PL 91-596: Occupational Safety and Health Act of 1970, as amended January 1, 2004. Occupational Safety and Health Administration. https://www.osha.gov/laws-regs/oshact/completeoshact . Accessed March 31, 2020.	Regulatory	n/a	n/a	n/a	n/a	Regulatory requirement for providing a safe work environment.	n/a
56	Park JC, Herbert EN. Laser goggles alter the perceived colour of drug labels, increasing the risk for drug errors. <i>Can J Ophthalmol</i> . 2013;48(2):e27-e28.	Expert Opinion	n/a	n/a	n/a	n/a	Provides examples of the discoloration caused by laser goggles.	VC
57	Lin CC, Tseng PC, Chen CC, Woung LC, Liou SW. Iritis and pupillary distortion after periorbital cosmetic alexandrite laser. <i>Graefes Arch Clin Exp Ophthalmol</i> . 2011;249(5):783-785.	Case Report	n/a	n/a	n/a	n/a	Eye injury occurred during eyebrow laser epilation when no eye protections was provided.	VB
58	Halkiadakis I, Skouriotis S, Stefanaki C, et al. Iris atrophy and posterior synechiae as a complication of eyebrow laser epilation. <i>J Am Acad Dermatol</i> . 2007;57(2 Suppl):S4-S5.	Case Report	n/a	n/a	n/a	n/a	Eye injury occurred during eyebrow laser epilation when no eye protections was provided.	VB
59	Mueller NM, Mueller EJ. KTP photoselective laser vaporization of the prostate: indications, procedure, and nursing implications. <i>Urol Nurs</i> . 2004;24(5):373-379.	Expert Opinion	n/a	n/a	n/a	n/a	Lists safety precautions for use with lasers.	VC
60	Hammes S, Augustin A, Raulin C, Ockenfels HM, Fischer E. Pupil damage after periorbital laser treatment of a port-wine stain. <i>Arch Dermatol</i> . 2007;143(3):392-394.	Case Report	n/a	n/a	n/a	n/a	Eye wear should be worn by both the employee and the patient.	VB
61	Huang A, Phillips A, Adar T, Hui A. Ocular injury in cosmetic laser treatments of the face. <i>J Clin Aesthet Dermatol</i> . 2018;11(2):15-18.	Expert Opinion	n/a	n/a	n/a	n/a	Eye wear should be worn by both the employee and the patient. Caregivers should be educated on laser use before using a laser.	VA
62	Dennis E. Decreasing airway fires. <i>OR Nurse</i> 2012. 2012;6(2):37-40.	Expert Opinion	n/a	n/a	n/a	n/a	Provides information related to fire safety when using lasers for head and neck surgery.	VB
63	Stuermer KJ, Ayachi S, Gostian AO, Beutner D, Hüttenbrink KB. Hazard of CO2 laser-induced airway fire in laryngeal surgery: experimental data of contributing factors. <i>Eur Arch Otorhinolaryngol</i> . 2013;270(10):2701-2707.	Nonexperimental	Laboratory study	n/a	n/a	Time to ignition	The greater the oxygen= concentration the lower the time to ignition.	IIIC

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64	Dhar V, Young K, Nouraei SA, et al. Impact of oxygen concentration and laser power on occurrence of intraluminal fires during shared-airway surgery: an investigation. J Laryngol Otol. 2008;122(12):1335-1338.	Nonexperimental	Laboratory study using a cadaveric porcine model	n/a	n/a	Time to ignition	The ignition time of moist patties was longer than dry patties. And the time was shorter for an increase in O2 percentage.	IIIB
65	Apfelbaum JL, Caplan RA, Barker SJ, et al. Practice advisory for the prevention and management of operating room fires: an updated report by the American Society of Anesthesiologists Task Force on Operating Room Fires. Anesthesiology. 2013;118(2):271-290.	Guideline	n/a	n/a	n/a	n/a	Evidence based guidelines for fire prevention and management from the ASA.	IVA
66	Hammons MA, Ramey NA, Stinnett S, Woodward JA. Effects of reflected CO2 laser energy on operative field materials: risks to patients and operating room personnel. Ophthalmic Plast Reconstr Surg. 2010;26(5):386-388.	Nonexperimental	Laboratory study	n/a	n/a	Burns from reflected laser beams.	Wet gauze and non-reflective surfaces should be used to prevent burns from reflected laser beams.	IIIB
67	Roy S, Smith LP. Prevention of airway fires: testing the safety of endotracheal tubes and surgical devices in a mechanical model. Am J Otolaryngol. 2015;36(1):63-66.	Nonexperimental	Laboratory study	n/a	n/a	Fire ignition of a	CO2 lasers should be used with a reinforced laser safe endotracheal tube.	IIIB
68	Coughlan CA, Verma SP. Evaluating the effects of a 532-nm fiber-based KTP laser on transoral laser surgery supplies. Otolaryngol Head Neck Surg. 2013;149(5):739-744.	Nonexperimental	Laboratory study using pulsed and continuous mode KTP laser.	n/a	n/a	Time to perforation of endotracheal tubes and neurosurgical patties.	The blue line on the patties would ignite but the white part did not when moist.	IIIB
69	Ahmed F, Kinshuck AJ, Harrison M, et al. Laser safety in head and neck cancer surgery. Eur Arch Otorhinolaryngol. 2010;267(11):1779-1784.	Nonexperimental	Laboratory study	n/a	n/a	Time to penetration	The time to penetrate laser resistant Et tubes, and moist neuro patties was longer than regular ET tubes and dry patties when using a CO2 laser.	IIIC
70	Li S, Chen L, Tan F. Laryngeal surgery using a CO2 laser: is a polyvinylchloride endotracheal tube safe? Am J Otolaryngol. 2012;33(6):714-717.	Nonexperimental	Laboratory	n/a	n/a	Endotracheal tube cuff bursting	Endotracheal tubes should be inflated with water when a laser is used in the vicinity of the endotracheal tube.	IIIA
71	Roy S, Smith LP. Surgical fires in laser laryngeal surgery: are we safe enough? Otolaryngol Head Neck Surg. 2015;152(1):67-72.	Nonexperimental	Laboratory study	n/a	n/a	Perforation of endotracheal tube cuff	Use of wet packs around endotracheal tube may help to prevent ET tube perforation.	IIIB

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72	Recommendations to reduce surgical fires and related patient injury: FDA Safety Communication. US Food and Drug Administration. https://www.fda.gov/medical-devices/safety-communications/recommendations-reduce-surgical-fires-and-related-patient-injury-fda-safety-communication . Updated July 18, 2018. Accessed March 30, 2020.	Expert Opinion	n/a	n/a	n/a	n/a	When not in use place lasers fibers in an area off the patient and in a holster or safety cover.	VC
73	van den Bos RR, Neumann M, Nijsten T. Laser fibre stabs the catheter: a serious complication of endovenous laser ablation. <i>Phlebology</i> . 2011;26(3):119-120.	Case Report	n/a	n/a	n/a	n/a	Report of a case in which the laser fiber punctured the catheter.	VB
74	Ren S, Liu P, Wang W, Yang Y. Retained foreign body after laser ablation. <i>Int Surg</i> . 2012;97(4):293-295.	Case Report	n/a	n/a	n/a	n/a	The laser sheath should be inspected after use to prevent any broken part being	VB
75	Lekich C, Hannah P. Retained laser fibre: Insights and management. <i>Phlebology</i> . 2014;29(5):318-324.	Case Report	n/a	n/a	n/a	n/a	Case report of a retained laser fiber with recommendations for precautions to take to prevent it from occurring.	VB
76	Lun Y, Shen S, Wu X, Jiang H, Xin S, Zhang J. Laser fiber migration into the pelvic cavity: a rare complication of endovenous laser ablation. <i>Phlebology</i> . 2015;30(9):641-643.	Case Report	n/a	n/a	n/a	n/a	Case report of a retained laser fiber.	VA
77	Bozoglan O, Mese B, Inci MF, Eroglu E. A rare complication of endovenous laser ablation: intravascular laser catheter breakage. <i>BMJ Case Rep</i> . 2013;2013.	Case Report	n/a	n/a	n/a	n/a	Report of a case in which a laser fiber was broken	VC
78	Sarioglu S, Polat A, Erentug V. Retained laser fiber during endovenous laser ablation. <i>Chirurgia</i> . 2014;27(3):177-178.	Case Report	n/a	n/a	n/a	n/a	Case report of a laser fiber breaking off in the vein.	VB
79	State Operations Manual Appendix L: Guidance for Surveyors: Ambulatory Surgical Centers. Rev. 200, 02-21-20. Centers for Medicare & Medicaid Services. https://www.cms.gov/media/423701 . Accessed March 31, 2020.	Regulatory	n/a	n/a	n/a	n/a	Regulatory requirement for credentialing	n/a
80	State Operations Manual Appendix A: Survey Protocol, Regulations and Interpretive Guidelines for Hospitals. Rev. 200, 02-21-20. Centers for Medicare & Medicaid Services. https://www.cms.gov/media/423601 . Accessed March 31, 2020.	Regulatory	n/a	n/a	n/a	n/a	Regulatory requirement for credentialing	n/a

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81	Edwards B, Sams B. Overview of the Board of Laser Safety's professional certification programs for laser safety officers. <i>Med Laser Appl.</i> 2010;25(2):70-74.	Expert Opinion	n/a	n/a	n/a	n/a	Provides information regarding the education of the laser safety officer.	VB
83	Ohshiro T, Ohshiro T, Sasaki K, et al. Correct calibration procedure for the Q-switched ruby laser and checking the treatment irradiation pattern. <i>Laser Ther.</i> 2013;22(3):171-180.	Expert Opinion	n/a	n/a	n/a	n/a	Describes steps and the rationale for calibration of lasers	VB
82	Appendix G: Laser safety and training programs. In: American National Standards Institute; Laser Institute of America. ANSI Z136.3-2018: American National Standard for Safe Use of Lasers in Health Care. Orlando, FL: Laser Institute of America; 2018:108-113.	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance on the education required for use of lasers	VC
84	Appendix I: Medical examinations. In: American National Standards Institute; Laser Institute of America. ANSI Z136.3-2018: American National Standard for Safe Use of Lasers in Health Care. Orlando, FL: Laser Institute of America; 2018:117-118.	Expert Opinion	n/a	n/a	n/a	n/a	Provides guidance regarding medical examinations associated with laser use	VC
85	29 CFR 1910.147 - The control of hazardous energy (lockout/tagout). https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.147 . Occupational Safety and Health Administration. Accessed March 31, 2020.	Regulatory	n/a	n/a	n/a	n/a	Requirements for tagout/lockout devices	n/a
86	Medical Device Reporting (MDR): How to report medical device problems. US Food and Drug Administration. https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems . Updated July 8, 2019. Accessed March 30, 2020.	Regulatory	n/a	n/a	n/a	n/a	Regulatory requirements for reporting malfunctioning equipment	n/a
87	The nurse's role in the use of laser, light, and energy emitting devices. <i>J Dermatol Nurses Assoc.</i> 2013;5(5):289-290.	Position Statement	n/a	n/a	n/a	n/a	Education is required to work with lasers	IVC
88	Wang HM, Lee KW, Tsai CJ, Lu IC, Kuo WR. Tracheostomy tube ignition during microlaryngeal surgery using diode laser: a case report. <i>Kaohsiung J Med Sci.</i> 2006;22(4):199-202. [VB]	Case Report	n/a	n/a	n/a	n/a	Personnel need education about the care of the patient after an ET tube fire and preventative measures.	VB
89	AlNomair N, Nazarian R, Marmur E. Complications in lasers, lights, and radiofrequency devices. <i>Facial Plast Surg.</i> 2012;28(3):340-346.	Expert Opinion	n/a	n/a	n/a	n/a	Operators should be educated on the potential side effects of lasers.	VB
90	Guideline for patient information management. In: <i>Guidelines for Perioperative Practice.</i> Denver, CO: AORN, Inc; 2020:357-386.	Guideline	n/a	n/a	n/a	n/a	Provides guidance for documentation.	IVA