



The Most Trusted Voice in Healthcare

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Fields of Competence

Health technology and patient safety management; medical device accident and incident investigation and prevention; risk management of healthcare technology accidents; forensic medical device accident investigation; accident investigation program development; medical device problem reporting programs, problem report analysis, and related governmental regulations; medical device standards development; surgical fire causes, prevention, extinguishment, and investigation; flammability testing; hazards of oxygen-enriched atmospheres in healthcare; surgical and intensive care health technology and medical devices; clinical and laboratory evaluation of medical equipment and systems; health technology acquisition; ambulance design; etiology and investigation of accidental skin injury during surgery or from medical devices.

Background

1. Member: ECRI Institute's Executive Management Committee since 1995. Chief responsibilities: ECRI's medical device accident and incident investigation and prevention programs and consulting services; forensic medical device investigation; health technology and patient safety; medical device problem reporting systems and regulations; medical device standards development.
2. Mr. Bruley's initial duties at ECRI Institute in 1975 included the clinical and laboratory evaluation of medical equipment and systems. His first projects involved comparative evaluations of emergency medical equipment used in ambulances and of emergency vehicle-extrication equipment. Within three years, he became responsible for ECRI Institute's hazard and accident investigation programs. These programs continue to be used to minimize the risks to patients (and personnel) by objectively investigating the causes of problems experienced with health technology, medical devices, equipment, and systems.
3. Throughout Mr. Bruley's 42-year tenure at ECRI Institute, he has conducted hundreds of hazard and accident investigations in the United States and internationally and performed thousands of laboratory-based investigations. These investigations have examined, in detail, diverse healthcare technologies ranging from anesthesia and cardiopulmonary bypass machines and ventilators to surgical saws, hospital beds, and hypo/hyperthermia units; from single-use disposable items, such as suture needles, surgical staplers, ECG electrodes, and surgical drapes, to systems problems, including medical gas and air-conditioning systems and sterilization processing equipment. He has also investigated epidemic and endemic illnesses among hospital personnel resulting from environmental contaminants.
4. For four decades Mr. Bruley has had primary responsibility for medical device fire investigations, including investigations of oxygen-enriched fires and health technology related flammability testing. He has investigated numerous fires that occurred during surgery and regularly published recommendations for their prevention starting in 1979. The Association of Peri-Operative Registered Nurses (AORN) consulted Mr. Bruley in the development of its 2006 and 2014 *AORN Fire Safety Tool Kit*. He and other ECRI Institute staff participated at the request of the American Society of Anesthesiologists (ASA) in drafting and peer review of the 2008 promulgated *ASA Practice Advisory for the Prevention and Management of Operating Room Fires*. In 2008, production of the educational video *Prevention and Management of Operating Room Fires*, commissioned by the Anesthesia Patient Safety Foundation

(APSF), was led by Mr. Bruley, with completion and delivery of the peer reviewed video in February 2010. He has also determined the cause and origin of numerous ambulance fires.

5. Beginning in 1980, Mr. Bruley concentrated his efforts on broadening ECRI Institute's capabilities for performing in-hospital and laboratory investigations of medical device accidents and on providing related case review and forensic services. He has performed hundreds of investigations in the clinical setting in the United States and internationally. His international investigations have taken him to Canada, Malaysia, Turkey, and the United Kingdom.
6. Since 1996, he has been a chief ECRI liaison to the U.S. FDA Center for Devices and Radiological Health (CDRH) regarding each agency's medical device problem reporting system and for the ECRI Institute/FDA collaboration on a number of critical patient safety initiatives, including re-use of single-use medical devices, electrocution hazards from unprotected patient electrocardiograph (ECG) lead wires, and patient safety risks from repaired, refurbished, and reconditioned medical devices. He directed ECRI Institute's contracted consultation to FDA CDRH for development of educational and training materials on medical device problem recognition and reporting for healthcare facilities that participate in the FDA MedSun medical device surveillance network (see Key Projects item 6, below).

Since formation of the FDA-sponsored [Hospital Bed Safety Workgroup](#) (HBSW) in 1999, Mr. Bruley has been an Issues Group Leader. HBSW is a voluntary partnership with representatives from the medical bed industry, national health care organizations, patient advocacy groups, and federal agencies. It's technical and risk management initiatives seek to reduce bed entrapment incidents. His HBSW work has focused on evidence-based equipment design and evaluation of bedrail guidelines. ECRI Institute's voluntary undertaking of the assembly and provision of the work product of the Workgroup, the "Bed System Entrapment Assessment Kit" was also Mr. Bruley's responsibility. In 2004, he was the ECRI Institute principal investigator for the FDA CDRH funded study to validate HBSW test methods and tools for assessing bed entrapment risk.

7. In 1997, his voluntary efforts led to the amendment of the 1990 FDA Safe Medical Devices Act (SMDA) (§ 519(b) [21 U.S.C. 360i(b)(C)]), via the Food and Drug Administration Modernization Act (FDAMA) of 1997 (Public Law 105-115, § 213(c)(1)(B)(iii)), to remove obstacles incorporated in the original SMDA legislation that impeded hospital and healthcare facility reporting of medical device problems and errors.
8. In 2000, he presented invited oral and written testimony on the research agenda for errors with healthcare technology at the First National Summit on Medical Errors and Patient Safety which was sponsored by the U.S. Quality Interagency Coordination Task Force (QuIC) and the Agency for Healthcare Research and Quality (AHRQ). [Internet citation: *Testimony at the National Summit on Medical Errors and Patient Safety Research*. September 2000. Quality Interagency Coordination Task Force (QuIC). <http://www.quic.gov/summit/testimony.htm>.]
9. Mr. Bruley was a consultant to the University of Chicago's Developing Center for Patient Safety from 2003 to 2004 on its AHRQ contract for "Creating High Reliability Healthcare Organizations" (AHRQ grant #P20 HS11553). His expertise in medical device design, accident analysis, and medical injury prevention was applied to the grant's pilot project "Coping with medical device hazards: a study of organizational practices."
10. Since 1977, Mr. Bruley has lectured or taught courses on healthcare technology topics at more than 250 domestic and international venues. His international engagements have taken him to Australia, Cameroon, Canada, France, Hong Kong, Malaysia, The Netherlands, Turkey, Saudi Arabia, United Kingdom, and Singapore. He has most frequently presented on medical device hazards; medical device accident recognition, investigation, and prevention; medical technology problem reporting programs and related FDA regulations; medical device risk management; the assessment, selection, acquisition, and management of medical equipment; implant tracking; surgical fires; the causes of accidental skin "burns" during surgery; and re-use of disposable medical devices. He served as Co-Chairman of the Patient Safety Track for the Association for the Advancement of Medical Instrumentation (AAMI) 2004 and 2005

Annual Conference and was Program Co-Chairman for the 2006 and 2007 AAMI conferences. In 1981 he lectured, by invitation, on the hazards of carbon monoxide poisoning of operating room personnel at the First International Congress for Safety, Health, and Well-Being in Hospitals in The Hague, The Netherlands. At this conference, he also served as Chairman of the World Health Organization's working group on chemical hazards and combinations of noxious agents.

Employment History

- 1995 ECRI Institute, Vice President, Accident and Forensic Investigation
- 1985 ECRI Institute, Director, Accident and Forensic Investigation Group
- 1984 ECRI Institute, Program Mgr., Accident and Forensic Investigation Group
- 1978 ECRI Institute, Senior Project Engineer
- 1975 ECRI Institute, Project Engineer
- 1972 summer, 1973 Summer, 1974 Summer: Mount Wilson Hospital for Tuberculosis and Respiratory Disease, Randallstown, MD. Nurse's aide and autopsy assistant.

Appointments

- 2004 Appointed to the Institute of Medicine (IOM) Committee on Postmarket Surveillance of Pediatric Medical Devices at the National Academy of Sciences.
- 2008-2014 Member: Board of Examiners. Healthcare Technology Certification Commission, United States Board of Examiners for Clinical Engineering Certification.

Editorial Advisory Boards

- *Pennsylvania Patient Safety Advisory* (published by Pennsylvania Patient Safety Authority)
- *OR Manager*

Ad Hoc Reviewer

- *Anesthesia and Analgesia*
- *Quality and Safety in Healthcare*
- *Commonwealth of Pennsylvania, Patient Safety Authority, Patient Safety Reporting System*
- Henriksen K, Battles JB, Marks ES, Lewin DI, editors. *Advances in patient safety: from research to implementation. Vol. 2, Concepts and methodology. AHRQ Publication No. 05-0021-2. Rockville, MD: Agency for Healthcare Research and Quality; Feb 2005 (<http://www.ahrq.gov/qual/advances/index.html#Contents>)*
- Henriksen K, Battles JB, Marks ES, Lewin DI, editors. *Advances in patient safety: from research to implementation. Vol. 3, Implementation issues. AHRQ Publication No. 05-0021-3. Rockville, MD: Agency for Healthcare Research and Quality; Feb 2005 (<http://www.ahrq.gov/qual/advances/index.html#Contents>)*.
- Henriksen K, Battles JB, Keyes MA, Grady ML, editors. *Advances in patient safety: New directions and alternative approaches. Vol. 4, Technology and Medication Safety Assessment. AHRQ Publication No. 08-0034-1. Rockville, MD: Agency for Healthcare Research and Quality; August 2008. [cited 2008 Sep 25]. Available from Internet: http://www.ahrq.gov/downloads/pub/advances2/vol1/Advances-Henriksen_104.pdf*

Education, Training, Certifications, and Awards

- B.S., Biomedical Engineering Technology, 1975. Temple University, Philadelphia, PA
- EIT (Engineer in Training) Certification, 1975: Pennsylvania State Registration Board for Professional Engineers
- Certified Clinical Engineer (2007), Healthcare Technology Certification Commission, United States Board of Examiners for Clinical Engineering Certification.
- Fellow of the American College of Clinical Engineering (2018)

Continuing Education Courses

- Fire and Arson Investigation, 1984. University of Delaware, Wilmington, DE
- Metallurgical Failure Analysis and Prevention, 1986. The Center for Professional Advancement, New Brunswick NJ

Awards

- American College of Clinical Engineering Devteq Patient Safety Award, 2003
- Institute of Electrical/Electronics Engineers, Philadelphia Chapter, Benjamin Franklin Key Award, 2007, 2013
- AAMI & Becton Dickinson Patient Safety Award 2014 <http://www.aami.org/awards/becton.html>
- [Lifetime Achievement Award](#) from American College of Clinical Engineering (2018)

Key Projects

1. **A Study of the Safety and Performance Requirements for Cryosurgical Devices (FDA Contract No. 223-77-5037, Task Order No. 2), Department of Health and Human Services, FDA Bureau of Medical Devices (now the Center for Devices and Radiological Health [CDRH]), Principal Investigator.** During this two-year project beginning in 1978, Mr. Bruley developed safety and performance requirements for cryosurgical units. This detailed study included literature reviews, technical reviews of cryosurgical devices, field surveys and in-office interviews of physicians employing this technology, observation of numerous cryosurgical procedures on patients, and production of a report of findings and recommendations. This study was performed in preparation for FDA's drafting of a standard for these devices. During the study, Mr. Bruley discovered the previously unrecognized hazards of exposure to nitrous oxide gas exhausted from cryosurgical units and stressed the need in the final report and in separate publications for elimination of this hazard through design changes of existing and future cryosurgical devices.
2. **Investigation of the causes of accidental surgical skin burns.** Mr. Bruley undertook in the late 1970s a comprehensive investigation at ECRI Institute of the causes and prevention of accidental skin injuries ("burns") that occur during surgery or are suspected of being caused by a medical device. For more than thirty years his published findings and frequent lectures on the subject have helped healthcare facilities prevent such injuries. In addition, he developed and published standard procedures and questionnaires for use in investigating such accidents, focusing on a multitude of etiologies including: electrical (electrosurgery, DC, AC); radiation therapy; thermal (hyperthermia units, radiant warmers); chemical (skin preps); and mechanical (pressure necrosis, crushing); and taking under consideration allergic reactions and diseases mistaken for technology-related injuries.
3. **Biomedical Engineering Program Development, UNESCO, Boğaziçi University Biomedical Engineering Institute, Visiting Professor.** Mr. Bruley spent several months in 1985 and 1986 as a visiting professor at Boğaziçi University in Istanbul, Turkey, as part of a UNESCO-funded program in which ECRI Institute participated. This program developed biomedical engineering capabilities and programs in Turkish hospitals through the University. Mr. Bruley instructed graduate students in techniques of medical device inspection, calibration, preventive maintenance, and accident investigation. In his numerous visits to Turkish hospitals, he performed detailed reviews of the clinical practices related to the delivery of anesthesia and to the use and maintenance of anesthesia equipment in Turkey. He also instructed the University's graduate students and professors on the inspection of anesthesia machines and hazards related to their use.
4. **Ambulance Technical Specification Development, Turkish Ministry of Health.** Mr. Bruley was responsible for producing technical specifications for four types of ambulances to be used in the Turkish civilian healthcare system. Specifications addressed patient compartment design, the complement of emergency medical equipment, electrical power distribution, the on-board medical gas system, and patient stretcher retention systems. More than 1,200 ambulances (including associated medical equipment) were purchased under this 1990-1991 contract. This was the largest single purchase of ambulances ever undertaken in any country. He was also responsible for review of the bids submitted in response to the purchase tender. The project included the coordination of on-site inspection of prototype

and production line ambulances.

5. **Special Assistance and Evaluation for Device Experience Reports, (FDA Contract No. 223-77-5037, Task Order No. 5), Department of Health and Human Services, FDA Bureau of Medical Devices (now the Center for Devices and Radiological Health [CDRH]), Principal Investigator.** Under this 1979-1980 contract, Mr. Bruley was responsible for supporting FDA's investigation of medical device problem reports received through its Device Experience Network. Upon request of FDA staff he researched medical literature and ECRI Institute databases and provided opinions and guidance to FDA regarding the incidence and seriousness of reported medical device problems, likely cause(s), relevant medical literature, and approaches to problem resolution.
6. **Development of training materials for the new FDA MedSun medical device surveillance network.** In 2001-2002, under an ECRI Institute subcontract to CODA, Inc., FDA's prime contractor for operating the MedSun pilot program, Mr. Bruley had principal responsibility for drafting and finalizing the documents that are provided by FDA to participating MedSun healthcare organizations to educate the administrative, risk management, and clinical personnel in the recognition, investigation, and prevention of medical device adverse events. He presented the materials at the first FDA training seminar for MedSun facilities in October 2002.

Professional Memberships

- American College of Clinical Engineering: Member
- American Society of Metals: Member
- Association for the Advancement of Medical Instrumentation (AAMI): Member
- Institute of Electrical and Electronics Engineers (IEEE): Member
- Hospital Bed Safety Workgroup (sponsored by FDA): Issues Group Leader
- Society for Biomaterials: Member

Past Committee/Society Memberships

- American Society for Testing and Materials (ASTM) ASTM F-4 Standards Committee on Cryosurgical Devices: Committee Member
- ASTM F29.08 Subcommittee on Operating Room Fire Safety: Committee Member
- AAMI Standards Committee on Aseptic Bacterial Barriers: Committee Member
- American College of Cryosurgery: Member

Publications

Mr. Bruley's publications on healthcare technology and related patient safety and biomedical/clinical engineering issues number approximately 165, including journal articles, proceedings, and book chapters. His ECRI Institute publications for which he was principal author or a major contributing author include more than 100 works. [Note: ECRI Institute's publications are institutional work products: individual authors are not identified in these published articles.]

1. ECRI Institute. H0225: Normal priority medical device alert. ECRI Institute continues to recommend maximum temperature setting of 130° F for blanket warming cabinets. Plymouth Meeting (PA): ECRI Institute; 2014 Feb 6. 3 p. (Health Devices Alerts).
2. New Clinical Guide to Surgical Fire Prevention. *Health Devices* 2009 Oct;38(10):314-332.
3. Surgical fire safety [Guidance article]. *Health Devices* 2006;35(2):45-66.
4. Investigating device-related burns [Guidance article]. *Health Devices* 2005;34(12):393-413.
5. Circumcision clamps, scissors-type: Procedure/checklist 480-0100 [Inspection and preventive maintenance (IPM)]

- procedure]. *Health Devices* 2000; 29(1):22-3.
6. Preventing patient entrapment in beds [Talk to the Specialist]. *Health Devices* 1998; 27(3):115-6.
 7. Nitrous oxide(N₂O) cryosurgical units must be scavenged [Hazard Update]. *Health Devices* 1996; 25(8):306-9.
 8. Fires from defibrillation during oxygen administration [hazard]. *Health Devices* Jul 1994;23(7):307-8.
 9. Investigating device-related “burns” [Guidance article]. *Health Devices* 1993; 22(7):334-52.
 10. Electric beds: Do not use in psychiatric wards [Hazard]. *Health Devices* 1991; 20(12):495-6.
 11. Oxygen regulator fire caused by use of two yoke washers [Hazard]. *Health Devices* 1990; 19(11):426-7.
 12. Infant home apnea monitors: Essential safety features and practices [Hazard]. *Health Devices* 1990; 19(4):142-5.
 13. Electric beds can kill children [Hazard update]. *Health Devices* 1989; 18(9):323-5.
 14. Fires from blankets warmed in microwave ovens [Hazard]. *Health Devices* 1989; 18(6):234-5.
 15. Getinge steam and EtO sterilizers with powered horizontal doors [Hazard]. *Health Devices* 1989; 18(3-4):135-7.
 16. Nitrous oxide cryosurgical units must be scavenged [Hazard]. *Health Devices* 1987; 16(12):407-9.
 17. Inspiron disposable adult manual resuscitator [Hazard]. *Health Devices* 1987; 16(11):377-8.
 18. Electric beds can kill children [Hazard]. *Health Devices* 1987; 16(3-4):109-110.
 19. Hall Surgairtome pneumatic drills [Hazard]. *Health Devices* 1986; 15(12):338.
 20. Amsco cart washers [Hazard]. *Health Devices* 1986; 15(12):335.
 21. Defibrillation in oxygen-enriched environments [hazard]. *Health Devices* Mar-Apr 1987;16(3-4):113.
 22. Should hospitals repair cryosurgical units? *Health Devices* 1986; 15(12):332.
 23. Ambulance fires: A hazard of heavy use. *Health Devices* 1986; 15(12):327.
 24. Amedco electric hospital beds, Models 3, 4, 2102, 2103, 2104, and 6830 [Hazard]. *Health Devices* 1986; 15(11):317.
 25. Air embolism from (Haemonetics Cell Saver III) autotransfusion units [Hazard]. *Health Devices* 1986; 15(7):210.
 26. OR fires: Preventing them and putting them out. *Health Devices* 1986; 15(5):132.
 27. Surgical lights [User Experience Network]. *Health Devices* 1986; 15(1):23.
 28. Inspiron disposable volume ventilator breathing circuits catalog no. 003282 [Hazard]. *Health Devices* 1983; 12(12):319-20.
 29. Electric beds and the pediatric patient [Hazard]. *Health Devices* 1983; 12(8):203-7.
 30. Electric beds in pediatric areas [Update]. *Health Devices Alerts* 1983 Apr 22.
 31. Inappropriate use of oxygen to inflate or power medical devices [Hazard]. *Health Devices* 1982; 12(2):54-5.
 32. Pneumatic tourniquets used for regional anesthesia [Hazard]. *Health Devices* 1982; 12(2):48-9.
 33. Electric beds in pediatric areas. *Health Devices* 1982; 11(11):302.
 34. Polyurethane foam pads banned in Boston - ECRI asks: Where's the fire? *Health Devices* 1982; 11(10):263ff.
 35. OR fires don't need flammable anesthetics [Poster]. *Health Devices* 1982; 11(7):207.
 36. OR fires: Preventing them and putting them out. *Health Devices* 1982; 11(7):207.

37. Foster reversible orthopedic bed [Hazard]. *Health Devices* 1982; 11(3-4):118-9.
38. Case study: An accident involving a washer-sterilizer. [Incident reporting and investigation] *Hospital Risk Control* 1982 Jun:A-8.2.
39. Defibrillator paddles on MRL Porta-Pak 80 and Model 450SL defibrillator/monitors [Hazard]. *Health Devices* 1981; 11(1):70-1.
40. Accidental skin injury: Recognition and prevention. [Incident reporting and investigation]. *Hospital Risk Control* 1981 Nov:B-9.4.
41. Accidental skin injury: Incident investigation and questionnaire. [Incident reporting and investigation]. *Hosp Risk Control* 1981 Nov:A-81.
42. Deseret Angiocath catalog no. 2878 [Hazard]. *Health Devices* 1981; 10(12):298.
43. Specialty beds require special attention. [Special clinical services]. *Hospital Risk Control* 1981 Sep:B-8.2
44. IVAC Models 530 and 531 infusion pumps [Hazard]. *Health Devices* 1981; 10(11):279.
45. American V. Mueller coagulation forceps [Hazard]. *Health Devices* 1981; 10(10):256.
46. Waterloo Model CBB-2 cardiac boards [Update]. *Health Devices* 1981; 10(10):246.
47. Waterloo Model CBB-2 cardiac boards [Hazard]. *Health Devices* 1981; 10(9):224.
48. Clinitron flotation therapy beds [Hazard]. *Health Devices* 1981; 10(8):200.
49. Ohio Hope II resuscitators [Hazard]. *Health Devices* 1981; 10(8):199-200.
50. Inflating surgical pneumatic tourniquets. *Health Devices* 1981; 10(8):197.
51. Sarns sternal saw [Hazard]. *Health Devices* 1981; 10(6-7):175.
52. Roto-Rest Mark I Kinetic treatment tables [Hazard]. *Health Devices* 1981; 10(6-7):171-2.
53. NDM ECG monitoring cables used on Stat Scope monitors [Hazard]. *Health Devices* 1981; 10(6-7):173-4.
54. Datascope Model 692 defibrillator paddles [Hazard]. *Health Devices* 1981; 10(6-7):171-2.
55. Diatek electronic thermometer probe covers [Hazard]. *Health Devices* 1981; 10(5):127.
56. Fenwal blood warmers [Hazard]. *Health Devices* 1981; 10(4):100.
57. Air embolism during angiographic injection [Hazard]. *Health Devices* 1981; 10(3):126.
58. Misuse of Aerway disposable nebulizer cups [Hazard]. *Health Devices* 1981; 10(3):76.
59. Borg-Warner Model 66 birthing bed [Hazard]. *Health Devices* 1981; 10(3):73-4.
60. X-ray detectable surgical sponges [Hazard]. *Health Devices* 1980; 10(2):52.
61. Weck and MPI pregelled disposable electrosurgical dispersive electrodes [Update]. *Health Devices* 1980; 10(2):51.
62. Stryker CircleBed and Wedge Turning Frame [Hazard]. *Health Devices* 1980; 10(1):27.
63. Weck and MPI pregelled disposable electrosurgical dispersive electrodes [Hazard]. *Health Devices* 1980; 10(1):25-6.
64. Help prevent skin injury [Poster]. *Health Devices* 1980; 9(12):313.

65. Skin injury in the OR and elsewhere [Hazard]. *Health Devices* 1980; 9(12):312-7.
66. AMI and Medi-Pak paddle pads [Hazard]. *Health Devices* 1980; 9(10-11):292.
67. Concept Accu-Temp disposable cautery units [Hazard]. *Health Devices* 1980; 9(10-11):291.
68. Inspecting electric beds in special care areas. *Health Devices* 1980; 9(10-11):283.
69. Bourns Bear I adult volume ventilators [Hazard]. *Health Devices* 1980; 9(9):244.
70. Cavitron radiant warmers, IW-10 series [Hazard]. *Health Devices* 1980; 9(8):212.
71. Babybird ventilators and Airbird resuscitators [Hazard]. *Health Devices* 1980; 9(8):211-2.
72. Inspiron disposable one-way valves [Hazard]. *Health Devices* 1980; 9(8):210-1.
73. Air Shields drainage system; operator error and misuse [Hazard]. *Health Devices* 1980; 9(7):188.
74. Siphon has cylinders and cryosurgical units [Hazard]. *Health Devices* 1980; 9(7):187.
75. Cobe Centry 2 hemodialysis machine [Hazard]. *Health Devices* 1980;9(7):186.
76. Nitrous oxide exhausted from cryosurgical units [Update]. *Health Devices* 1980; 9(7):180.
77. Cameron-Miller bipolar laparoscopy forceps, Models 80-7527 and 80-7545 [Hazard]. *Health Devices* 1980; 9(6):164.
78. Medtronic Model 6705 bipolar pacemaker catheter [Hazard]. *Health Devices* 1980; 9(6):163-4.
79. Datascope Model M/D3 defibrillator/monitor [Hazard]. *Health Devices* 1980; 9(6):162.
80. MRL Models MD520, MDR521, and MDR520 ECG monitors [Hazard]. *Health Devices* 1980; 9(4-5):131.
81. Fires during surgery of the head and neck area [Hazard]. *Health Devices* 1979; 9(2):50-2.
82. Misuse of Ohio non-immersion heaters [Hazard]. *Health Devices* 1979; 9(1):23.
83. Gendron wheeled stretchers [Hazard]. *Health Devices* 1979; 9(1):22.
84. Nitrous oxide exhausted from cryosurgical units [Update]. *Health Devices* 1979; 9(1):9.
85. Nitrous oxide exhausted from cryosurgical units [Hazard]. *Health Devices* 1979; 8(12):293-4.
86. Carrom electric beds [Hazard]. *Health Devices* 1979; 8(10-11):257.
87. Stryker wheeled stretchers [Hazard]. *Health Devices* 1979; 8(4):97.
88. Electric heating pads in hospitals. *Health Devices* 1978; 8(2):40.
89. Water mattresses on electric beds. *Health Devices* 1978; 7(11):290.
90. EMT traction splint [Update]. *Health Devices* 1978; 7(10):260.
91. Falls from beds. *Health Devices* 1978; 7(6-7):166-7.
92. Electrical safety of electric beds. *Health Devices* 1978; 7(6-7):152-3.
93. Electric beds [Evaluation]. *Health Devices* 1978; 7(6-7):147-72.
94. Borg-Warner hospital beds [Hazard]. *Health Devices* 1978; 7(5):144.
95. Electric blankets in hospitals. *Health Devices* 1978; 7(3):90.
96. Anti-shock trousers may support life [Poster]. *Health Devices* 1977; 6(10-11):275.
97. Anti-shock trousers [Evaluation]. *Health Devices* 1977; 6(10-11):265-77.

98. Emergency traction splints [Evaluation]. *Health Devices* 1977; 6(8):184-94.
99. Defibrillation on a water mattress. *Health Devices* 1977; 6(5):122.
100. Orthopedic litters [Evaluation]. *Health Devices* 1976; 5(10):239-45.

[For the following ECRI Institute publications Mr. Bruley was one of the major contributing authors (limited to 1990-present.)

101. Alternate-Site Burns from Improperly Seated or Damaged Electrosurgical Pencil Active Electrodes. *Health Devices* 2012 Oct; 41(10):334. See also: *Health Devices Alerts* 2012 Sep 11; Accession No. H0177.
102. ECRI Institute. Retained foreign objects: it's not the robot's fault. Plymouth Meeting (PA): ECRI Institute PSO; 2012 May 31. 3 p. (Patient Safety E-Alerts).
103. Internal wire breakage in reusable electrosurgical active electrode cables may cause sparking and surgical fires [hazard]. *Health Devices* 2009 (Jul); 38(7): 228-9.
104. ECRI Institute revises its recommendations for temperature limits on blanket warmers [hazard update]. *Health Devices* 2009 (Jul); 38(7): 230-31.
105. Using the wrong size surgical stapler cartridge can injure patients [hazard]. *Health Devices* 2009 Apr; 38(4): 120-30.
106. High-speed surgical drills may overheat and cause burns. *Health Devices* 2008 July;37(7):213-215.
107. Limiting the Temperature of Warming Cabinets Remains a Good Safety Practice [Hazard Report Update]. *Health Devices* 2006 Dec;35(12):458-461.
108. Limiting temperature settings on blanket and solution warming cabinets can prevent patient burns. *Health Devices* 2005 May;34(5):168-171.
109. Preventing burns and fires caused by high-powered light sources [hazard report]. *Health Devices* 2005 Sep;34(9):325-6.
110. A clinician's guide to surgical fires: how they occur, how to prevent them, how to put them out [guidance article]. *Health Devices* 2003; 32(1):5-24.
111. Before a surgical stapler fails [guidance article]. *Health Devices* 2001;30(9-10):370-371.
112. Trocars: New data on safety and selection [Guidance update]. *Health Devices* 2000;29(2-3):67-71.
113. Alternate-site burns from improperly seated electrosurgical pencil active electrodes [hazard] *Health Devices* 2000 Jan;29(1):24-7.
114. Fire blankets in the OR? [talk to the specialist]. *Health Devices* 1999;28(11):469.
115. Surgical fire hazards of alcohol [talk to the specialist]. *Health Devices* 1999;28(7):286.
116. Routine inspection needed for scissors-type circumcision clamps [Hazard]. *Health Devices* 1999; 28(3):115-6.
117. Sparking from and ignition of damaged electrosurgical electrode cables [hazard report]. *Health Devices* 1998;27(8):301-3.

118. Fire hazard created by the misuse of DuraPrep solution [hazard report]. *Health Devices* 1998;27(11):400-2.
119. Trocars: Safety and Selection [Guidance article]. *Health Devices* 1998;27(11):376-399.
120. Medical device problem reporting for the betterment of healthcare. *Health Devices* 1998;27(8):277-292.
121. Lesions and shocks during iontophoresis [hazard]. *Health Devices* Mar 1997;26(3):123-5.
122. Incompatibility of different brands of Gomco-Type circumcision clamps [Hazard]. *Health Devices* 1997; 26(2):76-7.
123. Electrosurgical airway fires still a hot topic [Hazard Update]. *Health Devices* 1996; 25(7):260-2.
124. Selecting fire extinguishers for the operating room [talk to the specialist]. *Health Devices* 1996;25(7):261, 263.
125. Modified testing procedure for manual resuscitators to minimize the risk of barotrauma resulting from a malfunctioning exhalation valve [hazard report]. *Health Devices* 1995;24(11):476-7.
126. Fiberoptic illumination systems and the risk of burns or fire during endoscopic procedures. *Health Devices* 1995;24(11):457-9.
127. Amputations with use of adult-size scissors-type circumcision clamps on infants [Hazard]. *Health Devices* 1995; 24(7):286-7.
128. Fires from oxygen use during head and neck surgery [hazard report]. *Health Devices* 1995;24(4):155-7.
129. Final Report: Medical Device Reporting Under the SMDA: A Guide for Healthcare Facilities and Manufacturers. Plymouth Meeting (PA): ECRI; 1996.
130. Damaged Allied Healthcare Products Gomco circumcision clamp. *Health Devices* 1993 Mar; 22(3):154-5.
131. The patient is on fire! - A surgical fires primer [Guidance article]. *Health Devices* 1992; 21(1):19-34.
132. Special Report: Medical Device Reporting Under the SMDA: A Guide for Healthcare Facilities. Plymouth Meeting (PA): ECRI; 1991.
133. Electric beds [Evaluation]. *Health Devices* 1986 Nov;15(11):299-318.

Articles, Proceedings, and Book Chapters in Other Publications

134. Bruley ME, Arnold TV, Finley E, Deutsch ES, Treadwell RT. Surgical fires: decreasing incidence relies on continued prevention efforts. *PA Patient Saf Advis* 2018 Jun 15(2). [cited 2018 Jun 26]. Available from Internet: http://patientsafety.pa.gov/ADVISORIES/Pages/201806_SurgicalFires.aspx or http://patientsafety.pa.gov/ADVISORIES/documents/201806_SurgicalFires.pdf.
135. Bruley ME. Challenges in Preventing Electrical, Thermal, and Radiation Injuries. In: Sanchez JA, Barach P, Johnson JK, Jacobs, JP, editors. *Surgical patient care: Improving safety, quality and value. Section III: Perioperative Quality and Patient Safety, Chapter 31*. New York: Springer Science+Business Media; 2017. Abstract available from Internet: https://rd.springer.com/chapter/10.1007/978-3-319-44010-1_31.

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138. Stoelting RK, Feldman JM, Cowles CE, Bruley ME. Surgical fire injuries continue to occur—prevention may require more cautious use of oxygen. *APSF Newsletter* 2012; 26:41–43. [cited 2013 Sep 14]. Available from Internet: http://www.apsf.org/newsletters/html/2012/winter/01_firesafety.htm.
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143. Bruley ME. Forensic engineering analysis of medical device accidents. *J Nat Acad Forensic Engineers* 2007 Jun;24(1):23-47.
144. Braun JA, Kessler L, Bruley M. FDA bed safety guidance: mitigating risk. *Nur Homes/Long Term Mgmt* 2006 May;55(5):36-41.). [cited 2008 Jun 18]. Available from Internet: <http://www.itlmagazine.com/ME2/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=1C37D01BC6EA4D0DA1B35F09FB7F0026>.
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150. Bruley ME. Surgical fires: perioperative communication is essential to prevent this rare but devastating complication. *Qual Saf Health Care* 2004;13(6):467–471. [cited 14 Oct 2014.] Available from Internet: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1743921/pdf/v013p00467.pdf>.
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153. Bruley ME, Coates VH. Regulatory and assessment agencies. In : Bronzino JD, ed. *The biomedical engineering handbook (3rd ed.)*. Boca Raton: CRC Press, 2006.
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155. Bruley ME, Coates VH. Regulatory and assessment agencies. In : Bronzino JD, ed. *The biomedical engineering handbook*. Boca Raton: CRC Press, 1995.
156. Bruley ME. The Brooklyn hospital fire and the Quality System Regulation {letter}. *Biomed Instr Tech* 1998 May–June; 32(3):234. Comment on *Biomed Instr Tech* 1997 Nov-Dec;31(6): 559ff.
157. Bruley ME. Accident and forensic investigation. In: van Gruting CWD, ed. *Medical devices: International perspectives on health and safety*. Amsterdam: Elsevier, 1994.
158. de Richemond AL, Bruley ME. Head and neck surgical fires. In: Eisele DW, ed. *Complications in Head and Neck Surgery*. St. Louis: Mosby-Year Book, 1993.
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161. Bruley ME. Ergonomics and error—Who is responsible. In: Proceedings of the *First Symposium on Human Factors in Medical Devices*. Plymouth Meeting: ECRI, CITECH, Health Industry Manufacturers Association (HIMA), Ben Franklin Technology Center of S.E. Pennsylvania, and FDA, 1989 Dec:6-10.
162. Bruley ME. ECRI reports on medical devices. In: Proceedings of the *Preproduction Quality Assurance and Liability Prevention Conference*. Bethesda, MD: American Society for Quality Control, 1989 Mar:121-7.
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164. Bruley ME. A study of safety and performance requirements for cryosurgical devices. FDA/BMDDP: Springfield, VA, National Technical Information Service; 1980 Sep:PB 81 124943.
165. Bruley ME. Measurement of critical properties of muslin and nonwoven sterile-wraps. *Med Instrum*. 1979 Jan-Feb;13(1):67.
166. Bruley ME. Guidelines for the selection and use of orthopedic litters. *EMT J* 1978; 2(6):76-80.
167. Bruley ME. Guidelines for the selection and use of anti-shock garments. *EMT J* 1978; 2(3):80-4.
168. Bruley ME. Guidelines for the selection and use of emergency stretchers. *EMT J* 1977; 1(9):45-9.

Lectures, Seminars, and Teaching Engagements (1977-2017)

Since 1977, Mr. Bruley has lectured or taught on healthcare technology topics at more than 300 domestic and international venues. His international engagements have taken him to Australia, Cameroon, Canada, China, England, France, Hong Kong, Malaysia, The Netherlands, Turkey, Saudi Arabia, and Singapore. He has most frequently presented on medical device hazards; medical device accident recognition, investigation, and prevention; problem reporting programs and related FDA regulations; medical device risk management; the assessment, selection, acquisition, and management of medical equipment; implant tracking; surgical fires; the causes of accidental skin "burns" during surgery; and re-use of disposable medical devices.

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| Oct 1977 | Course Instructor. "Hospital Safety, Accreditation, and Managing Medical Equipment." ECRI Fall 1977 Seminars. Detroit, MI, and Cleveland, OH. |
| Nov 1977 | Guest Lecturer. "Medical Device Research, Evaluation, and Hazard Investigation." American Hospital Association (AHA), American Society for Hospital Central Service Personnel (ASHCSP) regional meeting. Boston, MA. |
| Mar 1978 | Guest Lecturer. "Update on Emergency Equipment." Innovations in Rural Health; Hershey Medical Center. Hershey, PA. |
| Jun-Jul 1978 | Course Instructor. "Equipment Control Program Fundamentals and Electrical Safety in the ICU/CCU." ECRI 1978 Summer Seminars. Johnson City, NY, Milwaukee, WI. |
| Apr-Jun 1979 | Course Instructor. "Medical Device Recall and Medical Device Accident Investigation." ECRI Spring 1979 Seminars. Chicago, San Francisco, Miami, Harrisburg, PA, and Hampton, NH. |

- Mar 1981 Guest Lecturer. “Guidelines for Medical Device Care and Handling.” American Hospital Association, American Society for Hospital Central Service Personnel (ASHCSP) educational seminar. McLean, VA.
- Nov 1981 Guest Lecturer. “Guidelines for Medical Device Care and Handling.” American Hospital Association, American Society for Hospital Central Service Personnel (ASHCSP) educational seminar. New Orleans, LA.
- Sep 1981 Guest Lecturer. “Failure of Medical Devices—An Overview.” National Bureau of Standards Conference on Medical Devices. Gaithersburg, MD.
- Oct 1981 Guest Lecturer. “Carbon Monoxide Poisoning of Operating Room Personnel.” World Health Organization (WHO) First International Congress for Safety, Health, and Well-Being in Hospitals. The Hague, Netherlands. At this conference, Mr. Bruley also served as chairman of the WHO Working Group on Chemical Hazards and Combinations of Noxious Agents in Hospitals.
- Nov 1982 Guest Lecturer. “The Role of the Forensic Biomedical Engineer in Medical Device Products Liability.” Philadelphia Bar Association, Medico-Legal Committee. Philadelphia, PA.
- 1983-1995 Guest Lecturer. “The Biomedical Engineering Profession.” Temple University, College of Engineering, Professional Seminar Course (ENGRG 013), presented each semester. Philadelphia, PA.
- Jun 1983 Guest Lecturer. “The Decubitus Pad Flammability Controversy.” Philadelphia Fire Department. Philadelphia, PA.
- Jun 1983 Guest Lecturer. “The Data Collector/Reporter Perspective-Complaint Management Defect Reports, Product Registries.” Medical Devices and Diagnostic Instrumentation June 1983 Conference. New York, NY.
- Jul 1983 Course Instructor. “Current Issues in Operating Room technology.” Full-day, 8-hour course including a primer on electrosurgery and its hazards, “burn” accidents in the O.R., surgical fires, investigating surgical accidents, preventive maintenance and equipment control of surgical devices, and heating, ventilation, and air-conditioning (HVAC) system problems unique to the O.R. ECRI Summer 1983 Seminar. Myrtle Beach, SC, and New York, NY.
- Oct 1984 Guest Lecturer. “Medical Device Failures and Product Liability.” Hospital Association of Pennsylvania Fall Seminar. Hershey, Pennsylvania.
- May 1985 Guest Lecturer. “The Role of the Forensic Biomedical Engineer in Medical Device Product Liability.” Philadelphia Trial Lawyers Association. Philadelphia, PA.
- Jun-Aug 1985 Visiting Professor at Boğaziçi University Biomedical Engineering Institute in Istanbul, Turkey. Taught graduate students in the topics of medical device management and accident investigation, and in techniques of medical device inspection, calibration, preventive maintenance. Also instructed graduate students and professors on the management and hazards of anesthesia technologies. The secondment was continued in April-May 1986.
- Jun 1986 Guest Lecturer. “Managing Equipment-Related Incidents: Liability Implications.” Risk Management Advisors for the Federation of Jewish Philanthropies of New York. New York, NY.

- Sep 1986 Guest Lecturer. “Investigation of Medical Device-Related Accidents.” Risk Management Association of Western Pennsylvania. Pittsburgh, PA.
- Feb 1987 Guest Lecturer. “Managing Equipment-Related Incidents.” Michigan Society of Hospital Risk Management. Lansing, MI.
- Apr 1987 Guest Lecturer. “Managing Equipment-Related Accidents.” Medical Equipment Technicians Society. Pittsburgh, PA.
- May 1987 Guest Lecturer. “Managing Equipment-Related Accidents.” Maryland Society for Hospital Risk Management. Towson, MD.
- Sep 1987 Guest Lecturer. “Avoiding Equipment-Related Accidents.” American Society of Hospital Materials Managers. Narberth, PA.
- Sep 1987 Guest Lecturer. “Medical Device Accidents—Procedures and Equipment Exposures.” PHICO Insurance Company. Mechanicsburg, PA.
- Oct 1987 Guest Lecturer. “Avoiding Equipment-Related Accidents.” Daughters of Charity National Purchasing Service. Boston, MA.
- Oct 1987 Guest Lecturer. “Investigation of Medical Device-Related Accidents.” Pennsylvania Association of Nurse Anesthetists. Philadelphia, PA.
- Oct 1987 Guest Lecturer. “Minimizing Medical Device Liability—The Hospital/Device Interface.” Hospital Association of Pennsylvania. Hershey, PA.
- Nov 1987 Guest Lecturer. “Managing Equipment-Related Incidents.” Society of Health Care Risk Managers of New Jersey. Princeton, NJ.
- May 1988 Guest Lecturer. “Managing Equipment-Related Occurrences.” Spring 1988 Meeting, North Carolina Chapter of the American Society for Healthcare Risk Management (ASHRM). Wrightsville Beach, NC.
- Jun 1988 Guest Lecturer. “Minimizing Medical Device Liability.” 25th Annual Conference, American Society for Hospital Engineering of the American Hospital Association. Grand Rapids, MI.
- Oct 1988 Guest Lecturer. “Minimizing Medical Device Liability.” 5th Annual Biomedical Associations of Wisconsin Conference. Oshkosh, WI.
- Oct 1988 Guest Lecturer. “Minimizing Medical Device Liability.” Fall Meeting of the Virginia Chapter of the American Society for Healthcare Risk Management (ASHRM). Charlottesville, VA.
- Oct 1988 Guest Lecturer. “Minimizing Medical Device Liability.” 8th Annual Northeastern Symposium on Healthcare Technology. Nashua, NH.
- Dec 1988 Guest Lecturer. “Minimizing Medical Device Liability.” Franciscan Health System Risk Managers Meeting. Baltimore, MD.

- Mar 1989 Guest Lecturer. "Accident and Forensic Investigations--Minimizing Liability from Medical Device-Related Accidents." Hospital Insurance Forum Annual Meeting. Scottsdale, AZ.
- Mar 1989 Guest Lecturer. "ECRI Reports on Medical Devices." Preproduction Quality Assurance and Liability Prevention Conference; American Society for Quality Control. Bethesda, MD.
- Apr 1989 Guest Lecturer. "Oxygen-Enriched Fires During Surgery of the Head and Neck." Fourth Symposium on Flammability and Sensitivity of Material in Oxygen-Enriched Atmospheres; ASTM. Las Cruces, NM.
- Apr 1989 Guest Lecturer. "Investigation of Medical Device Failures in the Home Care Setting." 11th Annual Iowa Lung Conference; The Iowa Society for Respiratory Care. Cedar Rapids, IA.
- May 1989 Guest Lecturer. "Minimizing Medical Device Liability." Sisters of Charity Health Care Systems, Inc., Annual Risk Managers Meeting. Cincinnati, OH.
- May 1989 Course Instructor. "High-Risk Technologies: Minimizing the Risks and Liabilities" and "Medical Device Accident Investigation Procedures." Seminar on Risk Management in a High Technology Era; The Hospital Underwriters Mutual (HUM) Insurance Co., Buffalo and Albany, NY.
- Jul 1989 Guest Lecturer. "Medical Device Accident Investigation", "Hazards with Medical Devices in Critical Care Areas", and "Oxygen Enriched Fires During surgery of the Head and Neck." 2nd IFMBE Pan Pacific Symposium, sponsored by the International Federation for Medical and Biological Engineering and the Australia Federation for Medical and Biological Engineering. Melbourne, Australia.
- Jul 1989 Guest Lecturer. "Fires During Surgery of the Head and Neck." Grand rounds, Dept of Anaesthesia & Intensive Care, Royal Adelaide Hospital. Adelaide, Australia.
- Jul 1989 Guest Lecturer. "Equipment related patient injuries." Society for Medical and Biological Engineering. Adelaide, Australia.
- Sep 1989 Guest Lecturer. "Fires During Surgery of the Head and Neck." Toronto Anesthesiologists Association; The Wellesley Hospital. Toronto, Ontario, Canada.
- Oct 1989 Guest Lecturer. "Minimizing Medical Device Liability." 5th Annual Clinical Engineering Symposium and Technical Exhibition. Oak Brook, IL.
- Oct 1989 Guest Lecturer. "Minimizing Medical Device Liability." 6th Annual Biomedical Associations of Wisconsin Conference. Milwaukee, WI.
- Oct 1989 Guest Lecturer. "Fire and Safety in Anaesthesia." 17th Annual Education Forum sponsored by The Respiratory Therapy Society of Ontario. London, Ontario, Canada.
- Nov 1989 Guest Lecturer. "Minimizing Medical Device Liability." Mercy Health Services Annual Risk Managers Meeting. Farmington Hills, MI.
- Dec 1989 Guest Lecturer. "Ergonomics and Error—Who Is Responsible?" First Symposium on Human Factors in Medical Devices sponsored by ECRI, CITECH, HIMA, and the FDA. Plymouth Meeting, PA.

- Apr 1990 Guest Lecturer. “Careers in Biomedical Engineering.” Johns Hopkins School of Medicine, Department of Biomedical Engineering. Baltimore, MD.
- May 1990 Course Instructor. “How to Perform Medical Device Incident Investigations.” One-half day course presented at the Association for the Advancement of Medical Instrumentation (AAMI) 25th Annual Meeting and Exposition. Anaheim, CA.
- Jun 1990 Guest Lecturer. “Health Technology Selection and Procurement for the 1990s.” First Biomedical Engineering Regional Center Symposium on Health Care Technology Management, Boğaziçi University. Istanbul, Turkey.
- Nov 1990 Guest Lecturer. “Reporting Medical Device Hazards to Third Parties: Mandatory versus Voluntary Programs.” 12th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Philadelphia, PA.
- Mar 1991 Guest Lecturer and Keynote Speaker. “Global Trends in Healthcare Technology.” HealthTech '91 Conference—Health Technology in Developing Countries: Assessment, Procurement, and Maintenance. Yaoundé, Cameroon.
- Apr 1991 Course Instructor. “Medical Device Incident Investigation.” One-half day seminar, 8th Annual Medical Technology Symposium, Midwest Biomedical Society. River Grove, IL.
- May 1991 Guest Lecturer. “Medical Device Accident Investigation, Liability Prevention, and Problem Reporting.” Mechanisms of Perfusion VI, Perfusion Resource Association. Lake Buena Vista, FL.
- May 1991 Course Instructor. “How to Perform Medical Device Incident Investigations.” Full day course presented at the AAMI 26th Annual Meeting and Exposition. Washington, DC.
- May 1991 Guest Lecturer. “Medical Device Accident Investigation and Problem Reporting.” Annual Educational Meeting; Georgia Society for Healthcare Risk Management, Savannah, GA.
- Jul 1991 Guest Lecturer. “Focus on Technology: Apnea Monitors.” Home-Use Medical Devices Workshop; Canadian Bureau of Radiation and Medical Devices, Ottawa, Ontario, Canada.
- Aug 1991 Guest Lecturer. “Safe Medical Devices Act: What the Law Says and What Hospitals Will Have To Do.” Fifth Annual Conference on Health Care Insurance Management Issues; Ohio Society of Healthcare Risk Managers of the Ohio Hospital Association, Cleveland Ohio
- Oct 1991 Guest Lecturer. “Accident Investigation in Healthcare: The Safe Medical Devices Act of 1990.” New England Clinical Engineering Society. Hartford, CT.
- Oct 1991 Guest Lecturer. “Medical Device Accident Investigation and the Perfusionist.” Annual Meeting of the North Atlantic Region of the Society of Extracorporeal Technology. Trumbull, CT.
- Nov 1991 Guest Lecturer. “Investigating Medical Device Accidents.” Association of Hospital Risk Management of New York. New York, NY.

- Nov 1991 Guest Lecturer. “Investigating and Documenting Medical Equipment Incidents and the Safe Medical Devices Act.” The Universal Health Services, Inc., Annual Risk Management Training Program. King of Prussia, PA.
- Nov-Dec 1991 Guest Lecturer. “Investigating and Managing Medical Device Incidents.” The Safe Medical Devices Act of 1990: Implications for Health Care Personnel. AAMI seminar, cosponsored by ECRI, AORN, AACCN, ANA, FDA, AHA, and AHCA. Presented in seven locations nationwide: Boston, Chicago, Dallas, San Francisco, Los Angeles, Newark (NJ), and Miami.
- Feb 1992 Guest Lecturer. “Fires in the Operating Room.” Surgical grand rounds, The Johns Hopkins Hospital. Baltimore, MD.
- Mar 1992 Guest Lecturer. “The Safe Medical Devices Act of 1990.” Health Encounters II, Risk Management Symposium. Sponsored by Memorial Medical Center. Savannah, GA.
- Mar 1992 Guest Lecturer. “Fire Safety.” Educational Session at the 39th Annual Association of Operating Room Nurses Congress. Dallas, TX.
- May 1992 Guest Lecturer. “Surgical Fires.” Surgical grand rounds, Union Memorial Hospital. Baltimore, MD.
- Mar 1992 Guest Lecturer. “The Safe Medical Devices Act of 1990: How Healthcare Facilities Will Be Affected.” Hospital Council of Western Pennsylvania. Warrendale, PA.
- Apr 1992 Guest Lecturer. “Fabulous Failures.” Pennsylvania Society for Respiratory Care. Philadelphia, PA.
- Apr 1992 Guest Lecturer. “Surgical Trocars.” Surgical grand rounds, Monmouth Medical Center. Long Branch, NJ.
- May 1992 Course Instructor. “How to Perform Medical Device Incident Investigations.” One-half day course presented at the AAMI 27th Annual Meeting and Exposition. Anaheim, California.
- Jun 1992 Course Instructor. “Fire Safety in the OR: Keys to Being Prepared.” Southeastern Association of Operating Room Nurses (AORN) Chapter, CEU half-day course for OR nurses. Medical Center of Delaware, Christiana Hospital. Wilmington, DE.
- Oct 1992 Guest Lecturer. “Medical Devices: New FDA Tracking Requirements and Update on SMDA Problem Reporting” and “Incident Investigation Techniques.” Operating Room Nursing—New Perspectives: Update for OR Nurse Managers. Medical College of Georgia, Division of Continuing Education. Augusta, GA.
- Oct 1992 Visiting Professor. “Fires in the Operating Room.” Department of Anesthesiology, University of Maryland. Baltimore, MD.
- Nov 1992 Guest Lecturer. “The Biomed and The Law.” Philadelphia Area Medical Instrumentation Association monthly meeting. Plymouth Meeting, PA.
- Nov 1992 Course Instructor. “The Patient Is On Fire! Surgical Fires: Causes, Prevention and Extinguishing.” ECRI half-day seminar. Plymouth Meeting, PA.

- Feb 1993 Course Instructor. "Fire in the Operating Room." Baltimore Chapter of AORN, CEU one-half day course for OR nurses. Union Memorial Hospital. Baltimore, MD.
- Apr 1993 Guest Lecturer. "Review of Safety Features of Disposable Laparoscopy-Pelviscopy Trocars." Surgical grand rounds, Union Memorial Hospital. Baltimore, MD.
- Mar 1993 Guest Lecturer. "Clinical Encounters: What Everybody Should Know About Medical Devices." Health Encounters Risk Management Symposium, Swedish Medical Center. Denver, CO.
- May 1994 Course Instructor. "Medical Device Incident Investigations." One-half day course presented at 20th annual Canadian Medical and Biological Engineering Conference (CMBEC); sponsored by the Canadian Medical and Biological Engineering Society (CMBES). Vancouver, BC, Canada.
- May 1994 Guest Lecturer. "Investigating Device Related Events." 4th Annual New England Conference on Healthcare Risk Management, Massachusetts Society for Healthcare Risk Management. Mystic, CT.
- May 1994 Guest Lecturer. "Expert Witness or Fact Witness." AAMI 29th Annual Meeting and Exposition. Washington, DC.
- Jul 1994 Guest Lecturer. "Setting Realistic Priorities for Prevention of Macro-Shock Injury or Electrocution via Patient Cables and Electrode Leads." Unprotected Patient Cables and Electrode Lead Wires Conference, sponsored by FDA Center for Devices and Radiological Health. Washington, DC.
- Aug 1994 Guest Lecturer. "Perspectives on FDA Medical Safety Alerts and Health Advisories." International Medical Device Congress and National Policy Summit, Utah Biomedical Industry Council. Salt Lake City, UT.
- Oct 1994 Guest Lecturer. "Surgical Fires." Surgical grand rounds, Department of Anesthesiology, Children's National Medical Center. Washington, DC.
- Oct 1994 Guest Lecturer. "Investigating Device Related Incidents." Hospital Association of Pennsylvania Fall Conference. Hershey, PA.
- Jan 1995 Guest Lecturer. "Surgical Fires: Causes, Prevention, and Extinguishing." Three surgical grand rounds and one lecture open to other area hospital personnel; Rose Medical Center. Denver, CO.
- May 1995 Guest Lecturer. "Insidious Iatrogenic Oxygen-Enriched Atmospheres As A Cause of Surgical Fires." AAMI 30th Annual Meeting and Exposition. Anaheim, California.
- May 1995 Guest Lecturer. "Expert Witness or Fact Witness." AAMI 30th Annual Meeting and Exposition. Anaheim, California.
- May 1995 Course Instructor. "How to Perform Medical Device Incident Investigations." One-half day course presented at the AAMI 30th Annual Meeting and Exposition. Anaheim, California.
- Jun 1995 Guest Lecturer. "Fires in the Operating Room." Anesthesia/surgical grand rounds, University of Chicago Hospital. Chicago, IL.
- Sep 1995 Course Instructor. "Medical Device Incident Investigations." One-half day course presented at the 21st annual Canadian Medical and Biological Engineering Conference and IEEE 17th Annual

International Conference of the IEEE Engineering in Medicine and Biology Society, and the Canadian Medical and Biological Engineering Society; sponsored by the CMBES. Montreal, Quebec, Canada.

- Oct 1995 Guest Lecturer. “Anatomy of a Medical Device Accident and Claim.” American Society for Healthcare Risk Management (ASHRM) 17th Annual Meeting; AHA/ASHRM. Miami, FL.
- Nov 1995 Guest Lecturer. “Investigating and Managing Medical Device Incidents.” ProMutual Medical Mutual Insurance Company. Boston, MA.
- Mar 1996 Guest Lecturer. “Investigating Device-Related Incidents.” Philadelphia Area Society for Healthcare Risk Management (PASHRM). Philadelphia, PA.
- Apr 1996 Guest Lecturer. “Hospital Equipment buying Trends.” International Association of Medical Equipment Remarketers (IAMER) 3rd Annual Convention. Las Vegas, NV.
- May 1996 Guest Lecturer. “Safe Medical Devices Act Problem Reporting and Accident Investigation.” Mechanisms of Perfusion XI, Perfusion Resource Association. Orlando, FL.
- May 1996 Guest Lecturer. “Medical Device Reporting: ECRI Panel Discussion.” FDA Teleconference on Medical Device Reporting broadcast May 7, 1996. ECRI, Plymouth Meeting, PA.
- May 1996 Guest Lecturer. “What do you tell then when you do not yet know: (Medical device accidents and dealing with the media). Greater Philadelphia Health Assembly (GPHA) and American College of Healthcare Executives (ACHE). Philadelphia, PA.
- Jun 1996 Course Instructor. ”Medical Device Incidents: Investigation, Law and Liability.” Full-day course presented with course co-director Ronni Solomon, Esq., at the AAMI 31st Annual Meeting and Exposition. Philadelphia, PA.
- Jun 1996 Guest Lecturer. “The Biomedical engineering Expert.” Ninth Annual Seminar on the Prevention and Defense of Medical Device Claims, sponsored by Blackwell, Sanders, Matheny, Weary, & Lombardi, L.C., Nellcor Puritan Bennett, Inc., MedMarc, and HIMA. Williamsburg, VA.
- Aug 1996 Guest Lecturer. ”Investigating Device-Related Incidents.” Ministry of Health, Malaysia. Kuala Lumpur, Malaysia
- Sep 1996 Guest Lecturer. “Investigating and Managing Medical Device Accidents.” Northern New England society for Healthcare Risk Management (NNESHM) Annual Meeting and Conference. Ogunquit, ME.
- Sep-Oct 1996 Guest Lecturer. “Investigating Medical Device Accidents.” 9th Annual Managing Today's OR Suite, sponsored by *OR Manager*, Florida Hospital — Orlando, and The Operating Nursing Council of California. September—Orlando, FL; October—San Francisco, CA.
- Oct 1996 Guest Lecturer. “Investigating Device Related Incidents and SMDA Reporting.” Hospital Association of Pennsylvania (HAP). Hershey, PA.
- Feb 1997 Guest Lecturer. “Medical Device Accidents: Causes and Investigation.” Applied Physics Laboratory of the Johns Hopkins University. Laurel, MD.

- Mar 1997 Guest Lecturer. “Surgical Fires: Causes, Prevention, and Extinguishment.” Surgical grand rounds, St. Mary's Hospital. Langhorne, PA
- Apr 1997 Guest Lecturer. “Investigating and consulting on Medical Device Accidents.” American Association of Legal Nurse Consultants (AALNC) 1997 Conference. Pittsburgh, PA.
- May 1997 Guest Lecturer. “Electrosurgical Device Accident Investigation.” Quebec Biomedical Association Annual Meeting. Quebec, Canada.
- Jun 1997 Course Instructor. “Medical Device Incidents: Investigation, Law and Liability.” Full-day course presented with course co-director Ronni Solomon, Esq., at the AAMI 32nd Annual Meeting and Exposition. Washington, DC.
- Sep 1997 Course Instructor. “Investigating Oxygen Enriched Fires in the Healthcare Setting.” One-half day course, Annual Denver Fire Conference: Denver Fire Department. Denver, CO.
- Oct 1997 Guest Lecturer. “Re-use/Re-sterilization of Single-Use Devices.” Catholic Health Initiatives Annual Loss Prevention Meeting. Atlanta, GA
- Oct 1997 Guest Lecturer. “Investigating Device-Related Incidents.” Catholic Health Initiatives Annual Loss Prevention Meeting. Atlanta, GA
- Oct 1997 Guest Lecturer. “Perioperative Medical Device Accidents: Investigation, Implant Tracking, and SMDA Reporting.” AORN 1997 Perioperative Orthopedic Nursing Conference. Philadelphia, PA.
- Feb 1998 Guest Lecturer. “Grand Rounds: Fire in an Oxygen Enriched Environment.” Three surgical grand rounds presentations at William Beaumont Medical Center. Royal Oak, MI.
- Feb 1998 Guest Lecturer. “Preventing Fires in Operating Rooms and Nursing Units.” Michigan Society for Clinical Engineering. Detroit, MI
- Mar 1998 Guest Lecturer. “Investigating and consulting on Medical Device Accidents.” Philadelphia Chapter of American Association of Legal Nurse Consultants (AALNC). Pittsburgh, PA.
- Mar 1998 Guest Lecturer. “Blood/Solution Infusion with Blood/Solution Warmers and Autologous Blood Recovery Systems.” Three grand rounds presentations each at Good Samaritan Regional Medical Center, Phoenix, AZ, and Desert Samaritan Medical Center, Mesa, AZ.
- Apr 1998 Guest Lecturer. “Overview of Medical Device Accident Investigation.” Chubb Group of Insurance Companies Educational Program. Plymouth Meeting, PA.
- Apr 1998 Guest Lecturer. “Medical Device Accident Investigation.” MHA Insurance Co., Spring Risk Management Seminar, Compliance Management and Error Reduction: Initiatives for the Next Century. Traverse City, MI.
- May 1998 Guest Lecturer. “Medical Device Accidents: Investigative Considerations for ISOs.” HealthTech '98. Nashville, TN.

- May 1998 Guest Lecturer. “Everything You Always Wanted to Know About Sourcing Parts But Were Afraid To Ask” [Roundtable Discussion]. HealthTech '98. Nashville, TN.
- May 1998 Guest Lecturer. “Surgical Fires Are Preventable (Mostly)” [Poster Session]. American College of Clinical Engineering Annual Meeting. Philadelphia, PA.
- Jun 1998 Course Instructor. “Medical Device Incidents: Investigation, Law and Liability.” A full-day course presented with course co-director Ronni Solomon, Esq., at the AAMI 33rd Annual Meeting and Exposition. Philadelphia, PA.
- Jun 1998 Guest Lecturer. “ECRI Data on Accidents Related to Medical Device Refurbishing, Servicing, Remarketing, etc.” Presented at “Will FDA regulate refurbishers, servicers, and remarketers?": AAMI 33rd Annual Meeting and Exposition. Philadelphia, PA.
- Jun 1998 Guest Lecturer. “Oops!: User error and medical device accidents.” Tenth Annual Seminar on the Prevention and Defense of Medical Device Claims, sponsored by Blackwell, Sanders, Matheny, Weary, & Lombardi, L.C., Mallinckrodt, Inc. (Nelcor Puritan Bennett), MedMarc, and HIMA. Lake George, NY.
- Jun-Jul 1998 Guest Lecturer. "Medical Device Accident Investigation." Half-day course. The Virginia Insurance Reciprocal Group 1998 Summer Educational Program. June 10 Nashville, TN; June 11, Lexington, KY; July 31, Little Rock AR.
- Sep 1998 Guest Lecturer. “Case History Review: Pediatric Surgical Fires/Carbon Monoxide Poisoning During Anesthesia.” Anesthesia Management Conference, Harvard Medical School, Children’s Hospital Department of Anesthesia. Boston, MA.
- Sep 1998 Guest Lecturer. “Skin Burns During Surgery/Medical Device Accident Investigation Overview.” Surgical Management Conference, Harvard Medical School, Children’s Hospital Department of Anesthesia. Boston, MA.
- Sep 1998 Guest Lecturer. “Surgical Fires: Causes, Prevention, and Extinguishment.” Surgical Grand Rounds, Harvard Medical School, Children’s Hospital Department of Surgery. Boston, MA.
- Sep 1998 Guest Lecturer. “Investigating Accidents.” Chubb Group of Insurance Companies Educational Program. Plymouth Meeting, PA.
- Sep 1998 Guest Lecturer. “Is there evidence of a problem?” AAMI/FDA Conference on Medical Device Servicing, Remarketing, and Refurbishing: Is Regulation Needed? Reston, VA.
- Oct 1998 Guest Lecturer. “Medical Device Accident Investigation: The Role of the Materials Manager in Product Safety.” Pennsylvania Statewide Healthcare Materiel Management 1998 Conference. State college, PA.
- Dec 1998 Honorary Visiting Expert. “Seminar on Medical Device Accident Investigation.” Dec 7-10, 1998; four-day course containing 26 instructional modules. Ministry of Health, Singapore.
- Dec 1998 Guest Lecturer. “Accidental surgical skin "burns": Causes and prevention” and “Surgical fires: causes, prevention, and extinguishment.” Operating room nursing rounds. Singapore General Hospital, Singapore.

- Feb 1999 Guest Lecturer. "Surgical Fires—Causes and prevention and extinguishing." Grand Rounds, Department of Anesthesiology, University of Arizona College of Medicine at the Arizona Health Sciences Center, Tucson, AZ.
- Apr 1999 Guest Lecturer. "Overview of Medical Device Accident Investigation." Chubb Group of Insurance Companies Educational Program. Plymouth Meeting, PA.
- Apr 1999 Guest Lecturer. "Medical Device Accidents: Investigative Considerations for Independent Service Organizations." HealthTech '99, Baltimore, MD.
- Apr 1999 Guest Lecturer. "Patient falls at the bedside: Historical perspectives and current challenges." FDA/CDRH Hospitals Beds and the Vulnerable Patient Workshop. Washington, D.C.
- May 1999 Guest Lecturer. "Insights Into Current Practice: Reported Incidents and Hospital Decision Making Process." AAMI/FDA Conference—The Reuse of Single-Use Devices: Practice/Patient Safety/Regulation. Crystal City, VA.
- July 1999 Guest Lecturer. "Medical Device Accidents: Perspectives on Investigation and Reporting." FDA Global Harmonization Task Force, Study Group 2—Medical Device Vigilance—Post-Market Surveillance. Rockville, MD.
- Sep 1999 Guest Lecturer. "Investigating Accidents." Chubb Group of Insurance Companies Educational Program. Plymouth Meeting, PA.
- Nov 1999 Guest Lecturer. "Human Factors Considerations in Surgical Accidents with Medical Devices." 33rd Annual Combined Surgical Meeting; Chapter of Surgeons, Academy of Medicine, Singapore.
- Nov 1999 Guest Lecturer. "Overview of Causes and Investigation of Medical Device Accidents in Surgery and Critical Care." Seminar on Medical Device Accidents: Singapore General Hospital Post-Graduate Medical Institute. Singapore.
- Nov 1999 Guest Lecturer. "Medical Device Accident Investigation: A Review." Biomedical Engineering Department. Singapore General Hospital, Singapore.
- Nov 1999 Guest Lecturer. "ECRI Perspectives on the Y2K Problem." Biomedical Engineering Department. Singapore General Hospital, Singapore.
- Nov 1999 Course Instructor. "Medical Device Accident Investigation." One-day course containing 14 instructional modules. Inaugural Operating Room Nursing Seminar. Singapore General Hospital—Institute of Advanced Nursing, Chapter of Surgeons, Academy of Medicine, Singapore.
- Dec 1999 Guest Lecturer. "ECRI Comments on FDA's Proposed Strategy on Reuse of Single Use Devices." FDA Public Meeting Reuse of single Use Devices—FDA's Proposed Strategy. Rockville, MD.
- Apr 2000 Guest Lecturer. "Investigating Accidents." Chubb Group of Insurance Companies Educational Program. Plymouth Meeting, PA.
- Jun 2000 Guest Lecturer. "Mock Trial: Medical Instruments Accident Investigations." Half-day mock trial presented at AAMI 2000 Annual Conference and Exposition. San Jose, CA

- Jun 2000 Guest Lecturer. "Human Factors Considerations in surgical Accidents with Medical Devices." Presented at the session on Medical Devices and Human Error at AAMI 2000 Annual Conference and Exposition. San Jose, CA.
- Sep 2000 Invited Testimony. "The research agenda for errors with healthcare technology." Oral and written testimony presented at the First National Summit on Medical Errors and Patient Safety. Sponsored by the federal Quality Interagency Coordination Task Force (QuIC) and the Agency for Healthcare Research and Quality (AHRQ). Washington, DC.
- Oct 2000 Guest Lecture. "Reuse of Single Use Medical Devices." Presented at the Regulatory Affairs Professionals Society RAPS 2000 Annual Conference and Exhibition. Washington, D.C.
- Oct 2000 Course Lecturer and Panelist. "Accident Investigation: Healthcare versus Aviation Models—Medical Errors or Controlled Flight Into Terrain." Presented at Special Session: "Anatomy of a Perfusion Accident-Strategies to Reduce Risk" at the Perfusion Research and Education Foundation Case Reports IX conference. New Orleans, LA.
- Nov 2000 Guest Lecturer. "Reuse of Medical Devices." Presented at the American Society for Healthcare Risk Management (ASHRM) 2000 Annual Conference and Exhibition. New Orleans, LA.
- Nov 2000 Guest Lecturer. "Medical Mishap or Crime?" Presented at the American Society for Healthcare Risk Management (ASHRM) 2000 Annual Conference and Exhibition. New Orleans, LA.
- April 2001 Guest Lecturer. "Investigating Accidents." Chubb Group of Insurance Companies Educational Program. Basking Ridge, NJ.
- May 2001 Guest Lecturer. "Surgical Fires: Causes, Prevention, and Extinguishment." Catholic Health Association: Catholic Risk Management Forum Annual Meeting. St. Pete Beach, FL.
- Jun 2001 Course Director. "Accident Investigation." Half-day course presented at AAMI 2001 Annual Conference and Exposition. Baltimore, MD.
- Jun 2001 Guest Lecturer. "Mock Trial: Medical Instruments Accident Investigations." Half-day mock trial presented at AAMI 2001 Annual Conference and Exposition. Baltimore, MD.
- Jun 2001 Guest Lecturer. "Clinical engineers should sully their hands and be responsible for beds and stretchers." Presented at "The Technical Iconoclast Roundtable" at AAMI 2001 Annual Conference and Exposition. Baltimore, MD.
- Jun 2001 Course Director. "Accident Investigation." Half-day course presented at AAMI 2001 Annual Conference and Exposition. Baltimore, MD.
- Oct 2001 Guest Lecturer. "Human factors considerations in surgical accidents with medical devices." Presented to the Clinical Engineering Internship Program of the University of Connecticut at Weill Cornell Center of New York Presbyterian Hospital, New York, NY.
- Feb 2002 Guest Lecturer. "Hospital Bed Safety Workgroup Initiatives." Presented to the Pennsylvania Patient Safety Collaborative. Harrisburg, PA.

- Apr 2002 Guest Lecturer. "Investigating Accidents." Chubb Group of Insurance Companies Educational Program. Scotch Plains, NJ.
- May 2002 Guest Lecturer. "Medical Device Accidents: Overview and Case Examples." Presented to surgical, anesthesia and operating room nursing staffs at Sibley Hospital, Wash. DC.
- Jun 2002 Guest Lecturer. "Causes of medical device accidents and preventive approaches." Presented at the Association of Food and Drug Officials Annual Education Conference. Portland, OR.
- Oct 2002 Course Director. "Medical Device Accident Investigation." Half-day course presented to staff of regulatory and field inspection staff of the Medical Device Bureau, Health Products and Food Branch of Health Canada, Ottawa, Canada.
- Nov 2002 Guest Lecturer. "Incident Prevention with HFMEA and Investigation with RCA: VA and ECRI Approaches." Presented for the American College of Clinical Engineering audio teleconference on Healthcare Failure mode and Effects Analysis (HFMEA) and Root Cause Analysis (RCA).
- Feb 2003 Guest Lecturer. "Patient Safety and Information Management: Clinical Engineering Solutions." Presented at the Healthcare Information and Management Systems Society (HIMSS) 2003 Conference San Diego, CA
- Mar 2003 Closing Speaker. "Engineering Controls: Identifying and Disseminating Safety Research Recommendations for Medical Devices and Healthcare Information Technology." Presented at the closing plenary session of the Agency for Healthcare Research and Quality (AHRQ) 2nd Patient Safety Research Conference. Crystal City, VA.
- Apr 2003 Guest Lecturer. "Patient Safety, Medical Devices, and Healthcare Informatics." Presented for the audio teleconference of the Patient Safety & Outcomes Special Interest Group of the Healthcare Information and Management Systems Society.
- Apr 2003 "Investigating and Consulting on Medical Device Incidents." Presented at the American Association of Legal Nurse Consultants (AALNC) 14th National Educational Conference. Philadelphia, PA.
- May 2003 Guest Lecturer. "Investigating Accidents." Chubb Group of Insurance Companies Educational Program. Scotch Plains, NJ.
- Jun 2003 Guest Lecturer. "Training and Motivating Users to Identify and Report Product Problems." Presented at the AAMI 2003 Annual Conference and Exposition. Long Beach, CA.
- Sep 2003 Guest Lecturer. "Surgical Fires: The New Safety Initiatives." Presented at Managing Today's OR Suite 2003 Annual Meeting. San Diego. CA.
- Sep 2003 Guest Lecturer. "Surgical Fire Safety: Hospitals' Changing Roles" Presented for the ECRI's 2003 Health Devices audio teleconference series.
- Sep 2003 Guest Lecturer. "Surgical Fires: Causes Prevention and Extinguishing." Combined grand rounds: Surgery, Anesthesiology, and OR Nursing. Cedars Sinai Medical Center. Los Angeles, CA.
- Sep 2003 Guest Lecturer. "Design of Systems: Integration of medical equipment." Presented at the 2nd US/UK Patient Safety Research Methodology Workshop - Safety by Design, jointly organized by the

Agency for Healthcare Research and Quality (AHRQ) (USA), the Patient Safety Research Program (UK), and the National Patient Safety Agency (UK). Rockville, Maryland.

- Sep 2003 Guest Instructor. "Preventing operating room fires in head and neck surgery." Postgraduate course in head and neck surgery at the American College of Surgeons 89th Annual Clinical Congress. Chicago, IL.
- Mar 2004 Guest Lecturer. "Hot Topic: New Initiatives in Surgical Fire Prevention." Presented at the 51st Association of Peri-Operative Registered Nurses (AORN) Annual Conference. San Diego, CA
- Mar 2004 Guest Lecturer. "The Biomedical Engineer and Patient Safety: Looking Beyond Device Design." Presented at the March 2007 meeting of the Baltimore, MD, section of the Institute of Electrical and Electronics Engineers. Johns Hopkins, University, Baltimore, MD.
- Apr 2004 Guest Lecturer. "Surgical Fires: Causes, Prevention, and Extinguishing." Surgical grand rounds (3 venues), United Health Services Hospitals, Johnson City, NY, and Binghamton, NY.
- Jun 2004 Guest Lecturer. "Implementing prevention strategies for safety with healthcare technology." Presented at the American College of Clinical Engineering Symposium on Engineering Safety into the Healthcare Process. Boston, MA.
- Jun 2004 Co-Chair, Patient Safety Track for the Association for the Advancement of Medical Instrumentation (AAMI) 2004 Annual Conference and Exposition. Boston, MA.
- Sep 2004 Guest Lecturer. "Hazard management of low-incidence medical errors." Presented at the Agency for Healthcare Research and Quality (AHRQ) 3rd Patient Safety Research Conference. Crystal City, VA.
- Oct 2004 Guest Lecturer. Etiology of Intra-Operative and Post-Operative Skin "Burns". Combined grand rounds: Surgery, Anesthesiology, and OR Nursing. Jackson Memorial Hospital. Miami, FL.
- Oct 2004 Guest Lecturer. "Surgical Fires: Update on the New Safety Initiatives." Presented at Managing Today's OR Suite 2004 Annual Meeting. San Diego. CA.
- Nov 2004 Guest Lecturer. "Surgical Fires: Awareness of a Continuing Risk." Presented at AORN of the Twin Tiers, Chapter 3319, Annual Meeting, Johnson City, NY.
- May 2005 Co-Chair, Patient Safety Track for the Association for the Advancement of Medical Instrumentation (AAMI) 2005 Annual Conference and Exposition. Tampa, FL.
- May 2005 Guest Lecturer. "New FDA Guidelines for Prevention of Bed Entrapment." Association for the Advancement of Medical Instrumentation (AAMI) Annual Conference and Exposition. Tampa, FL.
- May 2005 Guest Lecturer. "Surgical Fires: New JCAHO Patient Safety Goals." Association for the Advancement of Medical Instrumentation (AAMI) Annual Conference and Exposition. Tampa, FL.
- May 2005 Guest Lecturer. "Clinical Engineers' Opportunities to Contribute to Patient Safety." Association for the Advancement of Medical Instrumentation (AAMI) Annual Conference and Exposition. Tampa, FL.
- Sep 2005 Expert Panel Member. "Technology, Performance and Surveillance." Heart Rhythm Society and

- FDA Policy Conference on Pacemaker and ICD Performance. Washington, DC.
- Sep 2005 Panelist. “Colloquium—Above Board: Issues in medical accident investigation and analysis.” Human Factors and Ergonomics Society 49th Annual Meeting. Orlando, FL.
- Oct 2005 Guest Lecturer. “Reporting of Medical Device Performance Problems: A Summary of ECRI’s 34 Years’ Experience.” Presented at the 16th Meeting of the Biomedical Engineering Materials and Applications (BEMA) Roundtable on “Long-Term Biomaterials Performance.” Organized by the National Materials Advisory Board, National Academy of Engineering, Institute of Medicine, National Research Council of the National Academies. Washington, DC
- Dec 2005 Guest Lecturer. “Surgical Fires: Awareness of a Continuing Risk.” Combined grand rounds: Surgery, Anesthesiology, and OR Nursing. Medical Center of Aurora. Aurora, CO.
- Jun 2006 Program Co-Chair, Association for the Advancement of Medical Instrumentation (AAMI) 2006 Annual Conference and Exposition. Washington, DC.
- Jun 2006 General Session Moderator. “JCAHO Answers Your Questions, with George Mills, Senior Engineer, Standards Interpretation Group, JCAHO.” Association for the Advancement of Medical Instrumentation (AAMI) 2006 Annual Conference and Exposition. Washington, DC.
- Oct 2006 Guest Presenter, “Only You Can Prevent OR Fires.” Panel presentation and discussion. American Society of Anesthesiologists, 2006 Annual Meeting, Chicago, IL.
- Oct 2006 Guest Lecturer. “Surgical Fires: Awareness of a Continuing Risk.” ASHRM 2005 Annual Conference and Exhibition ASHRM 2005 Annual Conference and Exhibition San Diego
- Jan 2007 Guest Lecturer. “Forensic Engineering Analysis of Medical Device Accidents: Investigative Processes and Information Resources.” National Academy of Forensic Engineers annual meeting, Ponte Vedra Beach, FL.
- Feb 2007 Guest Lecturer (via LiveMeeting video presentation). “Hospital Beds and the Vulnerable Patient: FDA and HBSW Guidelines for Prevention of Bed.” Given at “Lumetra Presents: *Almost* Everything You Always Wanted to Know About Physical Restraints from a Medico-Legal Perspective,” Pasadena, CA.
- Feb 2007 Course Instructor. “Training Seminar on Medical Device Accident Investigation.” February 11-14, 2007; four-day course containing 27 instructional modules. Saudi Food and Drug Authority, Medical Devices Sector, Riyadh, Kingdom of Saudi Arabia.
- May 2007 Guest Lecturer and Panel Member. “Medical Device Accidents: Recognition, Investigation, and Recall Alerting.” Presented at the annual National Patient Safety Foundation Patient Safety Congress, Washington, DC.
- Jun 2007 Program Co-Chair, Association for the Advancement of Medical Instrumentation (AAMI) 2007 Annual Conference and Exposition. Boston, MA.
- Jun 2007 General Session Moderator. “The Joint Commission Answers Your Questions, with George Mills, Senior Engineer, Standards Interpretation Group, The Joint Commission.” At the Association for the

- Advancement of Medical Instrumentation (AAMI) 2007 Annual Conference and Exposition. Boston, MA.
- Jun 2007 Guest Lecturer and Panel Member. "Preventing and Managing Surgical Fires." Presented at the American Academy of Otolaryngology - Head and Neck Surgery Foundation's 2007 Quality in Otolaryngology Conference, Crystal City, VA.
- Jan 2008 Guest Lecturer. "Forensic Engineering Use of Medical Information." National Academy of Forensic Engineers annual meeting, San Juan, PR.
- Jun 2008 Guest Lecturer. Human Factors in Incident Investigation. Presented at the American College of Clinical Engineering (ACCE) Clinical Engineering Symposium: Capturing the Heart and Mind of the Clinician –The Art and Science of Human Factors for Medical Systems. AAMI 2008 Annual Conference and Exposition. May 31, 2008. San Jose, CA.
- Sep 2008 Guest Lecturer. Grand rounds. "Surgical Fires: New Prevention and Safety Initiatives." New York Presbyterian Hospital/Columbia University College of Physicians and Surgeons. New York, NY.
- May 2009 Guest Lecturer. Grand Rounds. "Surgical Fires: New Prevention and Safety Initiatives." New York Presbyterian Hospital/Weill Cornell Medical Center. New York, NY. New York, NY.
- Jun 2009 Guest Lecturer. "Practical Uniform Terminology for Device Problems: Do Clinical Engineers/BMETs Need It?" AAMI 2009 Annual Conference & Expo. Baltimore, MD
- Dec 2009 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." Webinar. *OR Manager*. December 10, 2009
- Feb 2010 Guest Lecture. "New Clinical Guidance on Surgical Fire Prevention and Management." Webinar. Michigan Hospital Association PSO. February 4, 2010.
- Feb 2010 Guest Lecture. Grand Rounds. "New Clinical Guidance on Surgical Fire Prevention and Management." Webinar. The Children's Hospital of Philadelphia. February 18, 2010.
- Mar 2010 Course Instructor. "Medical Device Adverse Event Investigation and Management." March 9-12, 2010; four-day course containing 27 instructional modules. Hong Kong Productivity Council, Kowloon, Hong Kong.
- Mar 2010 Course Instructor. "Medical Device Adverse Event Investigation and Management." March 15-16, 2010; two-day course containing 20 instructional modules. Malaysian Society for Quality in Health. Kuala Lumpur, Malaysia.
- Apr 2010 Guest Lecturer. "Medical Device Accident Investigation." ASM International, Liberty Bell Chapter. Willow Grove, PA. April 15, 2010.
- Sep 2010 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." 23rd Annual Managing Today's OR Suite, sponsored by *OR Manager* and AORN Leadership Specialty Assembly. Orlando, FL. September 30, 2010.

- Sep 2010 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." Philadelphia Area Society for Healthcare Risk Management (PASHRM). Philadelphia, PA. September 23, 2010.
- Sep 2010 Guest Lecturer. Grand Rounds. "New Clinical Guidance on Surgical Fire Prevention and Management." Via Christi Hospital. Wichita, KS. September 21, 2010.
- Oct 2010 Guest Lecturer. Grand Rounds. "New Clinical Guidance on Surgical Fire Prevention and Management." Oregon Health and Sciences University Hospital. Portland, OR. October 18, 2010.
- Oct 2010 Guest Lecturer. Grand Rounds. "New Clinical Guidance on Surgical Fire Prevention and Management." Main Line Health System. Philadelphia, PA. October 19, 2010.
- Nov 2010 Guest Lecturer. "Medical Device Adverse Event Investigation." The 15th Asian Harmonization Working Party (AHWP) Meeting. Work Group Training Session: AHWP Technical Committee Meeting and Workshops. November 28, 2010 Riyadh, Saudi Arabia.
- Feb 2011 Guest Lecturer. "Medical Device Accident Investigation." ASM International, Brandywine Valley chapter. Chadds Ford, PA. February 8, 2011.
- May 2011 Guest Lecturer. "Clinical Guidance on Surgical Fire Prevention and Management." *OR Manager* Surgical Fire Prevention Webinar. May 5, 2011.
- May 2011 Course Director and Instructor. "Advanced Medical Device Adverse Event Investigation and Management" (5-Day Course). ECRI Institute, Plymouth Meeting PA. 9-13 May, 2011.
- May 2011 Guest Lecturer. Grand Rounds. "Fire Prevention and Management in the Surgical Setting." Main Line Health System. Bryn Mawr, PA. May 10, 2011.
- Sep 2011 Guest Lecturer. "Gas Embolism: A Serious Reportable Event and Investigating Gas Embolism." ECRI Institute PSO Webinar, September 7, 2011.
- Oct-Nov 2011 Course Director and Instructor. "Medical Device Adverse Event Investigation and Management" (4-week Course). ECRI Institute, Plymouth Meeting PA. 24 Oct-18 Nov, 2011.
- Dec 2011 Guest Lecturer. Second Annual Fire Safety Conference: "Partnering to Prevent Tragedy." Mount Sinai Hospital and the New York City Fire Department. Dec 9, 2011.
- Mar 2012 Guest Lecturer. Grand Rounds. "New Clinical Guidance on Surgical Fire Prevention and Management." Central Washington Hospital, Wanatchee, WA. March 13, 2012.
- Apr 2012 Guest Lecturer. Grand Rounds. "Fire Prevention and Management in the Surgical Setting." Main Line Health System. Bryn Mawr, PA. April 17, 2012.
- May 2012 Guest Lecturer. Grand Rounds. "New Clinical Guidance on Surgical Fire Prevention and Management." Capital Health System, Hopewell NJ. May 14, 2012.
- May 2012 Guest Lecturer. "It Takes Teamwork and Best Practices: Preventing a Patient Safety Disaster: Surgical Fires." 14th Annual National Patient Safety Foundation Patient Safety Congress, National Harbor MD, May 25, 2012.

- Sep 2012 Guest Lecturer. "Medical Device Accident Investigation." Illinois Hospital Association/Illinois Risk Management Services. East Peoria, IL. Sep 27, 2012.
- Oct 2012 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." Webinar for the Association of Peri-Operative Registered Nurses (AORN). October 12, 2012.
- Oct 2012 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." *Outpatient Surgery*, OR Excellence 2012 Conference. Ft. Lauderdale, FL. Oct 17, 2012.
- Nov 2012 Guest Lecturer. Grand Rounds. "New Clinical Guidance on Surgical Fire Prevention and Management." Crozer-Keystone Health System. Upland, PA. November 13, 2012.
- Nov 2012 Guest Lecturer. "Surgical Fire Prevention and Management." Healthcare Facility Managers Association of Delaware Valley. Trevese, PA. November 13, 2012.
- Feb 2013 Guest Lecturer. "Clinical Guidance on Surgical Fire Prevention and Management." *OR Manager* Surgical Fire Prevention Webinar. Feb 14, 2013.
- Feb 2013 Guest Lecturer. "Medical Device Accident Investigation – Getting It Right Can Save Lives." ECRI Institute, Health Devices program webinar. Wednesday, February 20, 2013.
- Mar 2013 Guest Lecturer. Grand Rounds. "Clinical Guidance on Surgical Fire Prevention and Management." Paoli Hospital and Surgical Center. Paoli, PA, March 2, 2013.
- Mar 2013 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." Presented at the 60th Association of Peri-Operative Registered Nurses (AORN) Annual Conference. San Diego, CA, March 4, 2013.
- Mar 2013 Guest Lecturer. Grand Rounds. "Clinical Guidance on Surgical Fire Prevention and Management." Temple University Hospital, March 13, 2013.
- Apr 2013 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." Presented at the Ambulatory Surgical Center Association (ASCA) annual meeting. Boston, MA, April 19, 2013.
- May 2013 Guest Lecturer. "New Clinical Guidance on Surgical Fire Prevention and Management." Presented at the 60th Association of Peri-Operative Registered Nurses (AORN) *eCongress* webinar. May 10, 2013.
- Jun 2013 Guest Lecturer. Grand Rounds. "Clinical Guidance on Surgical Fire Prevention and Management." Summit Medical Group, Berkeley Heights, NJ. June 5, 2013.
- Jun 2013 Guest Lecturer. "Medical Device Accident Investigation – Getting It Right Can Save Lives." ECRI Institute PSO webinar. June 10, 2013.
- Sep 2013 Guest Lecturer. Grand Rounds. "Clinical Guidance on Surgical Fire Prevention and Management." Butler Memorial Hospital, Butler, PA. September 17, 2013.

- Oct 2013 Guest Lecturer. Grand Rounds. "Clinical Guidance on Surgical Fire Prevention and Management." The Children's Hospital of Philadelphia. Philadelphia, PA. October 3, 2013.
- Oct 2013 Guest Lecturer. "Clinical Guidance on Surgical Fire Prevention and Management." Presented at the ASHRM 2013 Annual Conference and Exhibition, American Society for Healthcare Risk Management, Austin, Texas. October 27-30, 2013.
- Oct 2013 Guest Lecturer. Grand Rounds. "Fire Prevention and Management in the Surgical Setting." Main Line Health System. Bryn Mawr, PA. October 15, 2013
- Nov 2013 Guest Lecturer. "Medical Device Accident Investigation – Getting It Right Can Save Lives." ECRI Institute Healthcare Risk Control webinar. November 11, 2013.
- Feb 2014 Guest Lecturer. "Too Hot or Too Cold? ECRI Institute Answers Hospitals' Persistent Questions about Safe Blanket Warmer Temperatures." ECRI Institute, Health Devices program webinar. February 19, 2014.
- Mar 2014 Guest Lecturer. "Medical Technology Adverse Events: Management and Investigation for the Dental Operatory." Presented at the Chester/Delaware County Dental Society Quarterly Meeting. Concordville, PA, March 26, 2-14.
- Apr 2014 Course Director and Instructor. "Medical Device Adverse Event Investigation and Management." Two-Week Course presented to Saudi FDA staff. ECRI Institute. 14-25 April, 2014.
- Oct 2014 Guest Lecturer. "Surgical Fire Prevention and Management." Association of Peri-Operative Registered Nurses (AORN) webinar. San Antonio, TX. October 23, 2014.
- Nov 2014 Guest Lecturer. "Surgical Fires in the OR: Guidance Prevention and Management." Presented at Buxmont AORN Chapter 3912 "2014 Safety Symposium." ECRI Institute, Plymouth Meeting, PA. Nov 13, 2014.
- Nov 2014 Guest Lecturer. "Surgical and Procedural Fire Risk Assessment and Prevention." Presented at Allina Health, Minneapolis, MN. Nov 19, 2014. "Guidance on Surgical Fire Prevention."
- Apr 2015 Course Director and Instructor. "Medical Device Adverse Event Investigation and Management" Emergency Medical Equipment Branch of the Chinese Medical Equipment Association And the Chinese College of Clinical Engineering. Chengdu, China. 17-18 April, 2015
- May 2015 Guest Lecturer. "Guidance on Surgical Fire Prevention." Association of Surgical Technologists (AST) Annual National Conference. San Antonio, TX. May 16, 2015.
- Jun 2015 Guest Lecturer; Co Presenter. "CSI – Clinical Scene Investigation Developing an In-house Forensic Investigation Team. Association for the Advancement of Medical Instrumentation (AAMI) 2015 Annual Conference and Exposition. Denver, CO. June 8, 2015.
- Sep 2015 Guest Lecturer. "Surgical Fire Prevention and Management." Healthcare Facilities Management Society of New Jersey (Monthly Meeting), Union, NJ, September 17, 2015
- Sep 2015 Guest Lecturer. "Surgical Fire Prevention and Management." Association of Peri-Operative Registered Nurses (AORN) webinar. September 30, 2015.

- Oct 2015 Guest Lecturer. “Only *You* Can Prevent Surgical Fires: Surgical Fire Prevention and Management.” *Outpatient Surgery*, OR Excellence 2015 Conference. San Antonio, TX. October 15, 2015.
- Oct 2015 Guest Lecturer. “Guidance on Surgical Fire Prevention.” Ambulatory Surgery Center Association (ASCA). Webinar Series 2015. October 27, 2015.
- Oct 2016 Guest Presenter and Panel Member. IS THERE EVIDENCE OF A PROBLEM? Database Search Results 2006-2015 (10 years) of FDA MAUDE Database, ECRI's Health Devices Alerts (HDA), Accident Investigation Databases, and PubMed. Presented at at the FDA Public Workshop on the Proposed Rule Document: *Refurbishing, Reconditioning, Rebuilding, Remarketing, Remanufacturing, and Servicing of Medical Devices Performed by Third-Party Entities and Original Equipment Manufacturers; Request for Comments*. FDA White Oak Campus, Silver Spring, MD. October 27-28, 2016.
- Dec 2016 Guest Lecturer. Anesthesia Grand rounds. “Surgical Fire Prevention and Management.” New York Presbyterian Hospital/Columbia University College of Physicians and Surgeons. New York, NY. Dec 8, 2016.
- Mar 2017 Guest Lecturer. Anesthesia Grand rounds. “Surgical Fire Prevention and Management.” New York Presbyterian Hospital/Weill Cornell Medical Center. New York, NY. March 6, 2017.
- Apr 2017 Guest Lecturer. Surgical Grand rounds. “Surgical Fire Prevention and Management.” New York Presbyterian Hospital/Weill Cornell Medical Center. New York, NY. April 17, 2017.
- May 2017 Guest Lecturer. Grand rounds. “Medical Device Accident Investigation and Adverse Event Report Review.” International Association of Medical Equipment Remarketers and Servicers (IAMERS) 24th Annual Meeting. New Orleans, LA. May 4, 2017.
- Jun 2017 Guest Lecturer; Co Presenter. “Proving safety & effectiveness of your Health Technology Management (HTM) program to accreditation organizations and regulatory agencies.”. Association for the Advancement of Medical Instrumentation (AAMI) 2017 Annual Conference and Exposition. Austin, TX. June 11, 2017.
- Jun 2017 Guest Lecturer; Surgery and Anesthesiology Grand Rounds. “Surgical Fire Prevention and Management.” New York Presbyterian Hospital Queens. Flushing NY. June 28, 2017.
- Aug 2017 Course Director and Session Instructor. “Medical Device Adverse Event Investigation and Management.” Presented multiple lectures during the four-week course presented to Saudi FDA staff. ECRI Institute. August 21 – September 18, 2017.
- Oct 2017 Guest Lecturer. The Clinical Engineer and Patient Safety: Looking Beyond Device Design. New England Society of Clinical Engineering, Fall 2017 Symposium. October 24, 2017 Mystic, CT.
- Oct 2017 Guest Lecturer. The Magic of Clinical Engineering. New England Society of Clinical Engineering, Fall 2017 Symposium. October 25, 2017 Mystic, CT.
- Nov 2017 Guest Lecturer. Forensic Bioengineering. Temple University College of Engineering course Introduction to Bioengineering BIOE 3719/5719. Philadelphia, PA. November 13, 2017.

- Dec 2017 Guest Lecturer. Updated Review and Analysis: Clinical Guidance on Surgical Fire Prevention and Management. Pennsylvania Patient Safety Authority & PA Healthcare Facilities webinar. December 18, 2017.
- Dec 2017 Guest Lecturer. Updated Review and Analysis: Clinical Guidance on Surgical Fire Prevention and Management. ECRI Institute, Health Devices program webinar. December 20, 2017.
- Nov 2019 Guest Lecturer: Medical Device Accidents: Investigative Processes and the Biomedical Engineering Opinion. Gloucester County Legal Education Association. November 2, 2019.