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               Fort Detrick, Maryland  21702-5012

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Clinical Utility and Pitfalls of Ultrasound Guided Foreign Body Removal in War Fighters

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Part 1 of the 3 part study was conducted on 13 May 2009 at Nationwide Children's Hospital. This was a cadaver cohort study with video comparison between radiologists with percutaneous USFBR, conventional surgical foreign body removal, and surgical foreign body removal with wire localization comparing incision size, time of procedure, wound closure (number of sutures), overall removal success and procedural differences. In this component, comparison data was collected using human cadaver thighs for testing differences between the surgical and percutaneous techniques. Part 1 was completed with success in year 1 using the tasks described in the approved SOW. The hypothesis for part 1 was proven partially correct. The hypothesis was that ultrasound guided foreign body removal (USFBR) is faster and more effective than open surgical removal, with smaller incisions. The results found that USFBR is more effective than open surgical removal, with smaller incisions. However, the results also showed that the surgical method was faster. No progress was made in year 2 or year 3. A no cost extension (NCE) for future years 4 and 5 was approved. No progress was made in year 4 so we will pursue IRB and ORP HRPO approvals in year 5 quarter 1. We will also purchase the remaining supplies and equipment as stated in the budget justification. We anticipate scheduling part 2: training and part 3: clinical implementation in year 5.
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Introduction:

This is a three part study: Part 1 is a cadaver cohort study with video comparison between radiologists with percutaneous ultrasound guided foreign body removal (USFBR), conventional surgical foreign body removal, and wire localization followed by surgical foreign body removal, comparing incision size, time of procedure, wound closure (number of sutures), overall removal success and procedural differences. Part 2 is an educational efficacy research project. The physicians are trained with a turkey breast simulator. They will be evaluated and measured on their performance and competency development with USFBR. Part 3 is a clinical implementation of USFBR in military health care setting as part of patient care of wounded war fighters with symptomatic soft tissue foreign bodies retained after blast injuries.

Body:

As previously reported in the first annual report, Part 1 of the 3 part study was conducted on 13 May 2009 at Nationwide Children’s Hospital (NCH). All of part 1 was completed in year 1. This was a cadaver cohort study with video comparison between radiologists with percutaneous USFBR, conventional surgical foreign body removal, and surgical foreign body removal with wire localization comparing incision size, time of procedure, wound closure (number of sutures), overall removal success and procedural differences. In this component, comparison data was collected using human cadaver thighs for testing differences between the surgical and percutaneous techniques. Procedures were videotaped for a detailed analysis and accurate documentation of major and minor procedural differences. Statistical analysis projected 9 removals per procedures type would provide complete data sets for demonstration of statistical significance. Local IRB at NCH and secondary IRB approval through DOD ORP HRPO were obtained. Part 1 was completed with success in year 1 using the tasks described in the approved SOW.

The PI, William E. Shiels II, DO (Radiologist) implanted a total of 27 foreign bodies into human cadaver tissue. The anatomical materials used were human cadaver thighs. To remain consistent, all foreign bodies were the same. A 1 cm piece of a wooden toothpick was used to represent a traditional foreign body implanted in the cadaver tissue. Each cadaver thigh had 3 foreign bodies positioned into the tissue by Dr. Shiels. The study coordinator, Beth M. Haueuptle, MA timed, observed and documented the foreign body removals. Brad Hoehne (Graphic Animation Artist) had 2 digital video cameras on tripods documenting the procedures. He also hand held a high powered video camera which allowed for close up video to substantiate the findings. This same footage was used to develop future training materials in part 2 of the 3 part study. Dr. Shiels monitored the research efforts. Brian D. Kenney MD (surgeon) and James W. Murakami, MD (Radiologist) performing the foreign body removals; both physicians self-reported the start and end time, the incision size, number of sutures as well as the success or failure of the foreign body removal. This was done in conjunction with the written and video documentation for accuracy of findings.
Using a traditional surgical method following the skin marking of the foreign body location, Brian D. Kenney, MD completed 9 foreign body removals (3 in each thigh). The incision size for each removal ranged from 30mm – 58mm with a mean of 45.78 mm. The number of sutures ranged from 4 to 9 in order to effectively close the wound. The time to complete the procedure (skin to skin time) ranged from 4-15 minutes with a mean of 8.33 min.; 7 of the 9 removal attempts were successful. One foreign body was unable to be located by the surgeon. In a live situation the surgeon would send the patient to Radiology for wire localization and then the surgeon would re-operate with the wire localization method or percutaneous ultrasound guided foreign body removal would be completed by a radiologist.

Dr. William E. Shiels II, DO used ultrasound guidance for placement of localization wires at the site of each of 9 foreign bodies (3 in each thigh). Brian D. Kenney, MD then used an operative method following the wire localization to remove the foreign bodies. The incision size for each removal ranged from 24mm – 39mm with a mean of 32.1 mm. The number of sutures ranged from 3 to 6 in order to effectively close the wound. The time to complete the procedure (skin to skin time) ranged from 4-12 minutes with a mean of 7.1 min.; 8 of the 9 removals were successful. One foreign body was unable to be located by the surgeon.

The third removal type was percutaneous interventional radiological ultrasound guided foreign body removal. The technique was performed by James W. Murakami, MD. He completed 9 foreign body removals (3 in each thigh). The incision size for each removal ranged from 5mm – 9mm with a mean of 6.4 mm. Sutures are not needed for this removal technique due to the minimal incision size. A Band-Aid placed over the wound is standard of care. The time to complete the procedure (skin to skin time) ranged from 3-26 minutes with a mean of 12.2 min.; all 9 percutaneous removals were successful.

There are no previously reported findings to compare to our data.

No publications or presentations have been submitted, to date, for this research.

Unforeseen technical issues with cadaver materials occurred with both the surgical and the radiological procedures. The surgeon, Brian D. Kenney, MD commented that operative removal was a much easier in a cadaver compared to a live human because operative sites were not complicated by bleeding. During a procedure with a live patient the surgeon would need to stop every few minutes to manage bleeding which would lengthen the procedure time. During his first removal he commented that “this is necessitating significant tissue destruction to find the foreign body”. Additionally, the surgeon felt that blunt dissection facilitated movement of the foreign bodies in the surgical field; the surgeon switched from a blunt dissection to a sharp dissection to alleviate the movement issue. Both the surgeon and the radiologist reported the remarkable amount of movement with the foreign body removal. The surgeon noted that the 3 foreign bodies implanted in the third thigh with the traditional surgical removal were placed in the subcutaneous fat and not the muscle which made locating the foreign body easier. The wooden toothpicks were colored which the surgeon commented helped when searching for the foreign bodies. This is an advantage to the surgical method in the cadaver because the radiological method does not use an open operative field in which to see the color of the toothpick to help with localization. Dr. Kenney also verbalized the learning process of following the fascial penetration site for his operative approach; he said that once he adapted to that technique
then the process was simplified. Live human tissue with a foreign body and the time it takes to seek treatment would not leave such an easy hole to follow in order to locate the foreign body. This is seen as an advantage to the operative procedure in a cadaver. With respect to wire localization procedure, Dr. Kenney noted that wire localization made the removal process much easier. The key to success with this method was having an experienced interventional radiologist provide proper placement of the localization wire. If someone other than an experienced radiologist placed the wire, the failure rate would most likely increase. The radiologist in this study, Dr. Murakami, has performed over 100 foreign body removal procedures on living patients and expressed that it was very difficult working with cadaveric material. The mechanical (elastic) properties of the cadaver tissue effect the percutaneous ultrasound guided foreign body removal, seeming to add a degree of difficulty to cadaveric removal not experienced in live humans.

The findings demonstrated that percutaneous ultrasound guided foreign body removal technique has much less tissue destruction as compared with operative techniques; the incision size is also much smaller with this technique. This would result in a faster healing time if the foreign body removal was performed in a live patient. Sutures are not needed in the radiological method. The success rate was 100% for the percutaneous ultrasound guided foreign body removal technique. Whereas the removal success rate for the traditional surgical method was 78% successful and the surgical with wire localization was 89% successful.

Part 2 of the 3 part study is the competency training, testing, and documentation of military physicians in USFBR techniques. The approved SOW documented that this would take place in years 1-3. The unanticipated retirement of the part 2 PI, slowed down the submission process to the local IRB at USUHS. We worked in year 1 to change the PI but he later declined. The SOW and budget justification was revised and approved by TATRC on 03Oct2011. The revisions included the change of PI for part 2, participating MTFs, as well as the location change from USUHS to NCH. The revised SOW was submitted to TATRC and approved for a no cost extension for years 4 and 5. A second revised SOW and budget justification were submitted to TATRC on 17Sept2012 with changes in equipment supplies and new co-investigators at the participating MTFs. There were no changes in the study design. The second revisions are waiting for approval from the Grants Specialist Maribel Fratina. The protocol will be submitted to TAMC for local IRB approval as well as local IRB approval at NCH. We are working with TAMC IRB staff (Victoria Garshnek) to have the participating MTFs enter into an IAIR in order to have them defer IRB approval to TAMC and avoid having each MTF’s IRB review the same protocol. There will be and final approval through the ORP HRPO.

This phase of the research will have formalized and standardized procedural training, with development of clinical guidelines for physicians. The training and testing component was originally subcontracted to HMJF and was originally to be conducted at The Uniformed Services University of The Health Sciences (USUHS). The revised SOW approved by TATRC on 03Oct2011 now describes the training to be conducted at each MTF, NCH as well as at the AMEDD conference. Dr. Shiels, Dr. Murakami, Dr. Rooks or Associate Resident PI will be performing training and testing (and collecting data). COL Rooks will serve as the PI at TAMC and assist in the recruitment of Army physicians. All training will now be completed in year 5 of the project.
Competency testing and training will involve one day of didactic and hand-on training, with pre-test and post-test components. Didactic training materials will incorporate written, slide presentation, animation, and hands-on tissue model mentored training components. Physicians will undergo pre-testing with documentation of procedural omissions and errors, followed by standardized and formalized didactic and mentored hands-on training. Testing will include video review of a representative USFBR procedure followed by live procedural pre-testing of each physician for removal success, time to removal, demonstration of technical component proficiency, and successful recognition/management of technical pitfalls. Post-training assessment will document competency in a tissue model and document incorporation of standardized procedural steps in USFBR procedures with proper procedural steps and recognition/management of procedural pitfalls. Each physician will be required to successfully remove 5 wooden and 5 metallic foreign bodies to demonstrate procedural proficiency.

Part 2: Competency testing, training, and documentation of physicians in USFBR techniques. Nationwide Children’s Hospital is the primary site and other participating institutions/MTFs include TAMC, BAMC, WRNMMC, and MAMC. Training may also be performed at an AMEDD course by PI, CO-PI or Associate PI. The budget allows for training to be performed quarterly or at a minimum 2 times a year in order to meet the milestones. A minimum of 4 and a maximum of six physicians will be trained each session.

I. Standardized percutaneous USFBR training
   1. Training 1
      a. Pretest doctors
         i. Video demonstration of USFBR procedure
         ii. Hands-on pre-training test (15 minutes)
         iii. Written analysis of video documentation detailing the foreign body removal technique
            1. Time to removal
            2. Success/failure of removal attempt after 15 minutes
            3. Proper/errant alignment of insonation and instruments
            4. Proper/errant hand position and transducer position
            5. Proper/errant use of forceps in field of operation
            6. Proper/errant stepwise foreign body definition
            7. Proper/errant forceps grasp of foreign body
            8. Recognition/lack thereof-volume averaging artifact
            9. Recognition/lack thereof-oblique crosscut artifact
b. Phase one of standardized competency training of percutaneous ultrasound guided soft tissue foreign body removal
   i. Didactic classroom training (Powerpoint discussion with animations)
      1. Essentials of sonography-rationale and scientific basis
         a. Contact scanning
      2. Sonographic foreign body characterization
         a. Wood, metal, glass, plastic, stone/ceramic
      3. Standardized stepwise instruction in USFBR
         a. Includes options for forceps position-vertical vs. horizontal
         b. Forceps open vs. closed
         c. Foreign body definition prior to removal
         d. Blunt dissection vs. sharp dissection
         e. Hydrodissection
      4. Options for instrumentation-forceps
      5. Clinical management following USFBR
      6. Pitfalls
         a. Volume averaging artifact
         b. Oblique crosscut artifact
         c. Transducer angulation
         d. Central foreign body grasp
         e. Forceful foreign body grasp
         f. Tissue grasp vs. clean foreign body grasp
   ii. Hands on training-Turkey breast (or pork shoulder) tissue model with mentored training
      1. Physicians will perform USFBR
         a. Mentored training with live removal of wood and metallic foreign bodies in tissue models.
         b. Train to proficiency
   c. Post test
      i. Each physician removes 5 wood and 5 metallic foreign bodies
      ii. Video documentation of post-test
iii. Written analysis of video documentation
detailing the foreign body removal
technique

iv. Written analysis of video documentation
detailing the foreign body removal
technique
1. Time to removal
2. Success/failure of removal attempt
   after 15 minutes
3. Proper/errant alignment of
   insonation and instruments
4. Proper/errant hand position and
   transducer position
5. Proper/errant use of forceps in field
   of operation
6. Proper/errant stepwise foreign body
   definition
7. Proper/errant forceps grasp of
   foreign body
8. Recognition/lack thereof-volume
   averaging artifact
9. Recognition/lack thereof-oblique
   crosscut artifact

Part 3 is a clinical implementation study in at least one MTF, documenting USFBR
procedural parameters such as time to removal, incision size, type of foreign body,
fragmentation during removal, success for failure of removal attempt, blunt vs. sharp
dissection, complications, technical pitfalls encountered, time to return to function, time of
wound healing, and subjective patient evaluation of the experience. In part 3, clinical
comparison will be made with similar parameters, as possible, with patients who have
undergone traditional surgical fragment removal (chart review or documentation from
patients undergoing both procedures). In this clinical component, the objective will be for
symptomatic foreign bodies in soft tissues to be removed with USFBR, with referral
always at the discretion of the primary surgeon.

Specific procedural objectives would include USFBR incisions to be no longer than either
the width of the removal forceps or the width of the foreign body being removed. Local
anesthesia, sedation, or general anesthesia determinations will be made by the
radiologist/physician removing the foreign body. Expectations are for soft tissue foreign
bodies to be successfully removed intact, with greater than 90% success. Complications
are to be recorded, but expected complications should only include simple wound
infections as the anticipated complication (less than 10% occurrence). Pain following
USFBR should be little to none (less than 2 on a 10 point scale). Post-procedural care
should be the same as for routine wound care management from a sutured or non-sutured
wound. Sutures should be used if wounds are clean, larger than 5-6 mm in length, and if
longer than 6 mm, best closed with suture as opposed to tissue adhesive. Infected wounds
should be allowed to heal by secondary intention, without sutures. Implementation of
USFBR care should be completed in at least 5 war fighters by month 12 in order to demonstrate successful implementation in at least one military MTF to meet milestone.

Part 3 data collection will be performed in years 4 & 5. Dr. Shiels and Nationwide Children’s Hospital will be responsible for parallel clinical state-of-the-art procedural and care algorithm development using ultra-high resolution sonography, with linear, compact linear, phased array, and convex linear transducers. Dr. Shiels and Nationwide Children’s Hospital will provide quarterly, web-based state-of-the-art technology clinical and technical improvement updates. Dr. Shiels will provide annual on-site USFBR hands-on simulator procedural and technology update training at TAMC.

The study for Part 3 has been submitted to TAMC, NCH and ORP HRPO and we are waiting for notification of an approval. COL Veronica J. Rooks, MD, MC will serve as the PI at Tripler Army Medical Center (TAMC). William E. Shiels II, DO will be the Co-PI for part 3. Troy Koch, MD, CPT, MC, USA was not listed in the original SOW but was thought to join the research team at one time so his name was mentioned in the year 1 annual report. He is now not going to be part of the project due to conflict of time. His name has not been added to the study; no changes were submitted to the SOW and will not need to be submitted. Part 3 cannot begin until part 2 is approved and the physicians are trained in USFBR.

Key Research Accomplishments

Part 1 was completed with success in year 1 using the tasks described in the approved SOW.

Reportable Outcomes

No manuscripts, abstracts, presentations or other reportable outcomes have resulted from this research at this time.

Conclusion

The hypothesis for part 1 was proven partially correct. The hypothesis was that ultrasound guided foreign body removal (USFBR) is faster and more effective than open surgical removal, with smaller incisions. The results found that USFBR is more effective than open surgical removal, with smaller incisions. However the results also showed that the surgical method was faster. The results could have been affected by taking into account the differences in live tissue versus the dead tissue used with the cadaver thigh in this study. During future work or another comparison between radiologists with percutaneous USFBR, conventional surgical foreign body removal, and surgical foreign body removal with wire localization some changes would be recommended. Natural colored wooden 11 toothpicks would be a better choice than colored toothpicks that are easy to see in the cadaver tissue. Live tissue would alleviate the movement of the foreign body; but there would be no way to conduct a study on live patients with standardized implanting foreign bodies. A study could be done with live patients with existing foreign bodies but then there would not be any controls. Live patients would also have blood to make the operative portions of the study more life-like; however a researcher would not ever subject a patient to undue trauma from a surgical method if the percutaneous ultrasound guided foreign body removal
technique were available. The findings showed the percutaneous ultrasound guided foreign body removal technique to have much less tissue destruction than operative techniques; the incision size is also much smaller in this technique. This would result in a faster healing time if the foreign body removal was performed in a live patient. Sutures are not needed in the radiological method. The success rate was 100% for the percutaneous ultrasound guided foreign body removal technique; whereas, the success rate for traditional surgical method and surgical with wire localization were only 78% and 89% respectively. The knowledge gained from this research demonstrates that USFBR is a more effective and less traumatic method of removing foreign bodies and should be readily implemented into the military system by training military physicians in part 2 with a clinical implementation in part 3.

References


Appendices

APPENDICES:
Appendix 1: William E. Shiels II, DO curriculum vitae
Appendix 2: Foreign Body Removal Record Form
Appendix 3: Cadaver Cohort Study Data Spreadsheet
Appendix 4: Cadaver Cohort Comparison Study-Incision size
Appendix 5: Cadaver Cohort Comparison Study-Removal Time
Appendix 6: Cadaver Cohort Study – Wound Closure (Number of Sutures)
Appendix 7: Cadaver Cohort Study - Overall Success
APPENDIX 1
CURRICULUM VITAE
WILLIAM EUGENE SHIELS II, D. O.

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EDUCATION:

Undergraduate: Villanova University, Villanova, PA
B.S. in Biology
Graduation: May 1976

Graduate: Villanova University, Villanova, PA
M.S. in Biology
Graduation: July 1979

Medical School: Philadelphia College of Osteopathic Medicine
Philadelphia, PA
D.O.
Graduation: June 1983

Internship: Tripler Army Medical Center
Tripler AMC, Hawaii
Transitional Internship
July 1, 1983 - June 30, 1984

Residency: Tripler Army Medical Center
Tripler AMC, Hawaii
Diagnostic Radiology
July 1, 1984 - June 30, 1988

Fellowship: Children's Hospital Medical Center
Cincinnati, OH
Pediatric Radiology
July 1, 1988 - June 30, 1990

Military Education: AMEDD Officer Basic Course - 1980
Combat Casualty Care Course - 1987
Advanced Trauma Life Support (Provider) Course - 1987
HONORS AND AWARDS:

National Honor Society - 1972

U.S. Army Health Professions Scholarship - 1979

Outstanding Young Men of America - 1986

“Committee on Economics – Commission on General & Pediatric Radiology”: Distinguished Committee Service Award, American College of Radiology

"A Simple Device for Air Reduction of Intussusception"; Outstanding Presentation Award, Ohio State Radiological Society, Cincinnati, OH - April 28-30, 1989


"Practical Models for Invasive Sonography"; Certificate of Merit, Radiological Society of North America, Chicago, IL, December 1-6, 1991

"A Model for Interventional Breast Ultrasound"; Certificate of Merit, Radiological Society of North America, Chicago, IL, December 1-6, 1991


"Interventional Breast Ultrasound: Clinical Application"; Cum Laude, Radiological Society of North America, Chicago, IL, November 28-December 4, 1992

"Phantom of the Breast: A Model for Invasive Breast Sonography"; Finalist, International Health and Medical Film Festival, 1992

"Phantom of the Breast: A Model for Invasive Breast Sonography"; First Place Award, American Institute of Ultrasound in Medicine, San Francisco, CA, March 26-29, 1995


"Phantom of the Breast: A Model for Invasive Breast Sonography"; FREDDIE Award, Best in Category (video exhibit), International Health and Medical Film Festival, 1995

“Improved High-Resolution CT of the Lung in Infants and Very Young Children by Using a “Stop Ventilation Technique”: Bronze Medal Award, The Society for Pediatric Radiology, May 7-9, 1998

“Advances in Pediatric Airway Radiology” Wiet GJ, Shiels WE, Long FR, Rudman DT; First Place recipient of the Charles F. Ferguson Clinical Research Award, American Society of Pediatric Otolaryngology Annual Meeting, Orlando, FL, May, 2000

“Radiology: A Case-based Assessment”: Shiels WE, King MA. Best Team Award, Ohio Medical Education Network, 2000-2001 Season

2001-2002 Outstanding Clinical Science Faculty Award, Year 3 CPC
2001-2002 OMEN Outstanding Clinical Presentation Award - “Interventional Radiology Update”.

Degree of Fellow – American Osteopathic College of Radiology, September 27, 2002

“Site-Specific Induction of Lymphatic Malformations in a Rat Model for Imaging”; John Caffey Award for Outstanding Basic Science Research Paper, The Society For Pediatric Radiology Annual Meeting, Savannah, GA, April 26-May 2, 2004

Strathmore’s Who’s Who – Listed in the 2006-07 Registry

1st place Award – Scientific Presentation “New Interventional Radiology Techniques in the Treatment of Cystic Lesions of the Pediatric Head and Neck” Midwest Society for Pediatric Radiology Fall Conference, Minneapolis, MN 15-17 September, 2006


Columbus Monthly November, 2008 Issue Best Doctor Recognition November, 2009 Issue Best Doctor List for Central Ohio

Rotary Humanitarian Award District 6690 Athens, OH May 15, 2010

Dr. Floyd J. Trenery Memorial Medal AOCR Annual Convention Annual Awards Ceremony Palm Beach, FL 13 April, 2011

2011 Ohio State University Business Plan Competition Center of Entrepreneurship HOIA HEALTH 3rd Place Winner 9 June, 2011
Military Awards:
Superior Unit Citation
Army Commendation Medal
Army Achievement Medal
National Defense Service Ribbon
Army Service Ribbon
Air Assault Badge

MILITARY SERVICE:

U.S. Army Reserve: Inactive Reserve Duty: Medical School Academic Years 1979-83

Active Duty: Internship and Residency
Tripler AMC, 1983-1988

Pediatric Radiology Fellowship
Children's Hospital Medical Center, 1988-90

Chief, Pediatric Radiology Section
Department of Radiology
Walter Reed Army Medical Center
July 1990 to September 1992

U.S. Regular Army:
The Radiology Consultant to
The U.S. Army Surgeon General
November 1991 to December 1995

Chief, Pediatric Radiology Section
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Walter Reed Army Medical Center
July 1990 to January 1996

BOARD CERTIFICATION:

American Board of Radiology May 26, 1988
Diagnostic Radiology

American Osteopathic Board of Radiology: March 6, 1989
Diagnostic Radiology

American Osteopathic Board of Radiology: April 29, 1997
Certificate of Added Qualification:
Pediatric Radiology

American Board of Radiology November 3, 1997
Certificate of Added Qualification:
Pediatric Radiology
January 26, 2007
MOC (Maintenance of Certification)

MEDICAL LICENSURE:
Pennsylvania #OS-005439-L July 19, 1984
Ohio #34-004516 May 20, 1988
SOCIETY MEMBERSHIPS:

- American Medical Association
- American Osteopathic Association – Member # 040558
- American College of Physician Executives
- Society of Chairman of Radiology at Children’s Hospitals
- Radiological Society of North America
- The Society for Pediatric Radiology
- American Roentgen Ray Society
- American College of Radiology
- Central Ohio Radiological Society
- Society of Radiologists in Ultrasound
- The American Society of Emergency Radiology
- The Rotary Club of Dublin A. M. Honorary Membership

ACADEMIC APPOINTMENTS:

Chairman, Department of Radiology
Children’s Hospital, Columbus, OH
1 July, 1995 to present

Adjunct Professor, Department of Radiology, School of Medicine
The University of Toledo Medical Center, Toledo, OH
1 July, 1998 – present

Clinical Professor, Radiology and Category M on the graduate faculty in Biomedical Engineering
The Ohio State University Medical Center
Department of Radiology, Columbus, OH
October 1, 2005 – present

Affiliate Staff, Radiology & Nuclear Medicine I
The Children’s Medical Center, Dayton, OH
June 19, 2006 – present

Visiting Scientist
Department of Radiology, Armed Forces Institute of Pathology, Washington, D.C.
July 1, 1991 to present

Graduate Faculty in Biomedical Engineering
The Ohio State University Medical Center
Department of Radiology, Columbus, OH
March, 2003 – present

Clinical Assistant Professor of Radiology
Ohio University College of Osteopathic Medicine
Athens, OH
November, 2006 – 2009
Clinical Associate Professor of Radiology
June, 2010-2013

Adjunct Assistant Professor of Radiology/Radiological Sciences
Department of Radiology/Radiological Sciences
Uniformed Services University of the Health Sciences (USUHS)
F. Edward Hebert School of Medicine
11 February 2008 – 30 June 2009
Assistant Professor of Radiology/Radiological Sciences (Non-Tenured)
1 July 2009 – 11 April 2011

Assistant Professor of Radiology
Department of Radiology, Uniformed Services University of the Health Sciences, Bethesda, MD
September 1990 July 1996

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July 1990 to December 1995

Chief of Fellows and Residents
Department of Radiology, Children's Hospital Medical Center, Cincinnati, OH
Academic Year 1989-1990

Attending Radiologist
Children's Hospital Medical Center and the University of Cincinnati College of Medicine,
Cincinnati, OH
October 1988 - June 30, 1990

Volunteer Instructor
Department of Radiology, University of Cincinnati College of Medicine, Cincinnati, OH
July 1 1988 - June 30 1989

Clinical Instructor
University of Hawaii, John A. Burns School of Medicine, Honolulu, HA
October 1983 - June 1984

Graduate Teaching Assistant
Villanova University, Villanova, PA
January 1979 - May 1979

Instructor - Biology and Physical Science
Malvern Preparatory School, Malvern, PA
August 1976 - June 1978

OTHER APPOINTMENTS:

American Board of Radiology Examiner
Diagnostic and Pediatric Radiology CAQ
2004-05

International Radiology Liaison and Facilitator
Iraqi Medical Reconstitution
Iraqi Medical Specialty Forum
2003 – present

Consultant
US Food and Drug Administration (FDA)
Center for Devices and Radiological Health
Department of Health & Human Services
4/7/02 – 4/6/06
Consultant to the Center for Biologics Evaluation and Research
Food and Drug Administration (FDA)
Vaccines and Related Biological Products Advisory Committee
Department of Health & Human Services
4/22/04 – 4/21/08

Radiologic Scientific Advisor
Food and Drug Administration
Vaccine Trials Branch
Department of Health & Human Services
April, 2000

Academy of Radiology Research
Board of Directors
1 November, 1998 to present

Advisory Council Member
The Childhood League Center
An Early Education Center for Children with Special Needs
1999 to present

Pediatric Radiology Examination Team Member
American Osteopathic Board of Radiology
1 July, 1997 to present

American Osteopathic Board of Radiology
Examination Team Leader
September 1997 to present

President and Executive Director
The Children’s Radiological Institute, Columbus, OH
1 July, 1995 to present

American College of Radiology
Mammography Accreditation Committee
April 1993 to present

Association of Military Surgeons of the United States
Alternate Delegate
American Medical Association, Young Physicians Section
1 November, 1992 to 1 November, 1995

American College of Radiology
ACR Councilor
October 1992-October 1995

The Radiology Consultant to the U.S. Army Surgeon General
November 1991 to December 1995

U.S. Army Delegate
American Medical Association, Resident Physician Section
December 1986 - June 1990
COMMITTEES AND OFFICES:

Secretary - Medical School Student Council
Philadelphia College of Osteopathic Medicine
Academic Year 1980-1981

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Credentials Committee
American Medical Association - RPS
Annual Meeting
June 1988-1989

Office of The Surgeon General, Radiology Representative
Department of Defense Civilian External Peer Review Program
Medical Advisory Panel
September 1992 to December 1995

DOD Civilian External Peer Review Program
Pediatric Emergency Medical Services Panel
August 1992 to December 1995

Committee Member
American Osteopathic College of Radiology
Committee on Evaluation and Educational Standards
1992 to 2003

Committee Member
American Osteopathic College of Radiology
Committee on Governmental Affairs
1992 to 2004

Office of The Surgeon General, Radiology Representative
Department of Defense /NASA
Russian-American Telemedicine Demonstration Project
March 1993 to June 1993

Department of Defense Representative
American College of Radiology
Mammography Accreditation Committee
April 1993 to January 1996

Committee Chair
The Society for Pediatric Radiology
Policy and Action Committee
May 1993 to September 1996
Board Member
American Osteopathic College of Radiology
Board of Directors
October 1993 to 1998

Department of Defense Representative
National Mammography Quality Assurance Advisory Committee
March 1994 to January 1996

Committee Chair
Department of Defense, Office of Health Affairs
MHSS Radiology Proponent Committee: Cost Benefit Analysis of Digital Imaging Systems
September 1994 to December 1995

Committee Member
American College of Radiology
Committee on Economics of the Commission on General Radiology and Pediatric Radiology
November 1994 to present

Managing Director
RadNet, Inc., Radiology Network
Board of Directors
1 October, 1996 – 2000

Committee Member
The Society for Pediatric Radiology
Clinical Practice Committee
November 1996 to May 1998

Editorial Committee Member
American Osteopathic College of Radiology
1996-2002
Vice-Chair – 1997-2001

Committee Member
American Osteopathic College of Radiology
Committee on Manpower
November, 1995 to 2000

Committee Member - Medical Executive Committee
Quality Improvement Program
Children’s Hospital, Columbus, Ohio
January, 1997 to December, 1997

Committee Member
Children’s Hospital
Emtek Physician Order Entry Steering Committee
April, 1997 – April 1998

Committee Member
American Osteopathic College of Radiology
Nominating Committee
1996 – 2007
Chairman – 2005-2007
Committee Member
American Osteopathic College of Radiology
Evaluation and Educational Standards
October 1992 – September 2000

Committee Member
American Osteopathic College of Radiology
Education & Training of Residency Program Directors
October 1993 – September 1997

Committee Member
Children’s Hospital
Utilization Management Committee
Children’s Hospital and Physicians’ Healthcare Network (CHPHN)
June, 1997 – July 1999

Parliamentarian
American Osteopathic College of Radiology
1997 to 1998

Committee Member
Customer Service Council
Children’s Hospital
Columbus, Ohio

Committee Member
Medical Executive Committee
Children’s Hospital, Columbus, Ohio
January, 1998 to December, 1999

Committee Member
American Osteopathic College of Radiology
Committee on Governmental Affairs
1992 - 2004

Chairman
American Osteopathic College of Radiology
Committee on Strategic Planning
1997 to 2001
Committee Member 2001-2004

Committee Member
Professional Advisory Committee
Children’s Hospital Homecare and Hospital
Columbus, Ohio
June, 1998 – June, 1999

Advisory Committee Member
Children’s Hospital Radiology Research Program (CHRRP)
June, 1998 to present
Committee Member
Faculty Development Committee
Children's Hospital
Columbus, Ohio
July, 1998 – December, 1999

Committee Member
Advisory Committee
Telehealth Advisory Committee
Children’s Hospital
Columbus, Ohio

Co-Chairman
“Hands-On” How To Course Committee
RSNA Refresher Course Committee
28 October, 1998 – October, 2003

Committee Member
American Osteopathic College of Radiology
Ad Hoc Committee on Teleradiology
November, 1998 – November, 2000

Chairman
American Osteopathic College of Radiology
Revisions Committee
December, 1998 – December 2000

Committee Member
American Osteopathic College of Radiology
Liaison Committee on Research
1998 to 1999
Chairman 1999 - 2004

Board Member
Academy of Radiology Research
Academy Board of Directors
1 January, 1999

Committee Member
Graduate Medical Education Committee
Children’s Hospital
January, 2000 – present

Committee Member
2000 Credentials Committee
Children’s Hospital
Columbus, Ohio
January, 2000 to January, 2001

Committee Member
American College of Radiology
Pediatric Radiology Committee
October, 2001 - present
Secretary
American Osteopathic College of Radiology
October 1999 – September 2000

Vice-President
American Osteopathic College of Radiology
October 2000 – September 2002

President-Elect
American Osteopathic College of Radiology
October 2002 – September 2004

President
American Osteopathic College of Radiology
October 2004 – September 2005

Alternate Councilor to the American College of Radiology
American College of Radiology
September 2002 – 2004

Committee Member
American Osteopathic College of Radiology
Nominating Committee
2001-2002 & 2003-04 year

Board Member
Task Force on Revising Quality Programs
American College of Radiology
September 2004 – 2005

Committee Member
American Osteopathic College of Radiology
Finance Committee
November 2005 – October 2007

Committee Member
Mentor
American Osteopathic College of Radiology
Committee on New Physicians in Practice
November 2005 – October 2009

Representative
American Osteopathic College of Radiology
AFIP Conjoint Committee for Radiology
2005-2007

Representative
American Osteopathic College of Radiology
To the American College of Radiology
2002-2005

Committee Member
American Osteopathic College of Radiology
Education Foundation
2000 – 2005
Treasurer 2005 - 2007
Member
Tech Columbus
December, 2008

Committee Member
American Osteopathic College of Radiology
Ceremonial Procedures, Fellowships, Honors and Memorials
November 2009 – April 2011

Co-Chairman
“How Hands-On” How To Course Committee
RSNA Refresher Course Committee
2010-2013

EDITORIAL REVIEW BOARDS

Reviewer
Cardiovascular and Interventional Radiology Journal
2004-05

Editorial Reviewer
Journal of Hong Kong College of Radiology
13 Sept. 1999 to 31 Dec. 2010
1 January 2011 – 31 December 2014

Editorial Reviewer
Pediatric Radiology
1994 to present

Editorial Reviewer
American Journal of Roentgenology
1993 to present

Editorial Reviewer-Radiology
Journal of the American Osteopathic Association
1990 to present

Editorial Reviewer
Pediatrics
November 2000 - Present

Journal Reviewer
Radiology/AJR
August, 2002 – Present

COURSES AND GUEST LECTURESHIPS:

1. Imaging of the Pediatric Patient
   Guest Lecturer
   Northern Kentucky University, Highland Heights, KY
   December 13, 1989
2. **The Neonatal Chest**  
   NICU Symposium  
   University of Cincinnati Hospital, Cincinnati, OH  
   January 29, 1990

3. **Techniques of Invasive Sonography: A Hands-on Practicum**  
   Course Moderator  
   Children's Hospital Medical Center, Cincinnati, OH  
   February 10, 1990

4. **Practical Models for Invasive Sonographic Training**  
   Doppler Ultrasound with Emphasis on the Pediatric Patient  
   Omni Netherland Plaza, Cincinnati, OH  
   June 15-16, 1990

5. **Radiologic Management of Intussusception: Techniques and Rationale**  
   Department of Radiology, Milton S. Hershey School of Medicine,  
   Pennsylvania State University, Hershey, PA  
   July 30, 1990

6. **Techniques of Invasive Sonography: A Hands-on Practicum**  
   Department of Radiology, Milton S. Hershey School of Medicine,  
   Pennsylvania State University, Hershey, PA  
   July 30, 1990

7. **Airway Imaging Techniques in Children**  
   The 15th Annual MG Paul H. Streit Memorial Otolaryngology Seminar  
   Uniformed Services University of the Health Sciences, Bethesda, MD  
   March 1, 1991

8. **Practical Models for Invasive Sonography**  
   Magnetic Resonance Imaging, Color-Flow Doppler Ultrasound, and Other Special Imaging Techniques in the Pediatric Patient  
   Park City, Utah  
   March 11-15, 1991

9. **Childhood Intussusception: Diagnosis and Treatment**  
   Magnetic Resonance Imaging, Color-Flow Doppler Ultrasound, and Other Special Imaging Techniques in the Pediatric Patient  
   Park City, Utah  
   March 11-15, 1991

10. **Airway Imaging Techniques in Children**  
    AFIP Basic Science Course in Otolaryngology, Washington, D.C.  
    May 7, 1991

11. **Techniques of Freehand Invasive Sonography ("Hands-On " Workshop)**  
    The Radiological Society of North America, Chicago, IL  
    December 1-6, 1991

12. **Pediatric Radiology Update: 1992**  
    Uniformed Services Pediatrics Seminar, Crystal City, VA  
    March 22-26, 1992
13. **Imaging of the Pediatric Airway**  
   Uniformed Services Pediatrics Seminar, Crystal City, VA  
   March 22-26, 1992

14. **Intussusception: Diagnosis and Treatment**  
   AFIP Gastrointestinal Radiology Review, Bethesda, MD  
   May 2-3, 1992

15. **Imaging of the Pediatric Airway**  
   The 43rd Military Medical Surgical Clinical Congress, Willingen, Germany  
   May 18-21, 1992

16. **Pediatric Radiology Update for the Non-Radiologist**  
   The 43rd Military Medical Surgical Clinical Congress, Willingen, Germany  
   May 18-21, 1992

17. **Radiologic Diagnosis of Developmental Dysplasia of the Hip**  
   The 43rd Military Medical Surgical Clinical Congress, Willingen, Germany  
   May 18-21, 1992

18. **Introduction to Pediatric Radiology**  
   Madigan Army Medical Center, Tacoma, Washington  
   11 August, 1992

19. **Techniques of Freehand Invasive Sonography ("How-To" Workshop)**  
   Madigan Army Medical Center, Tacoma, Washington  
   August 12, 1992

20. **Pediatric Airway Disease**  
   Madigan Army Medical Center, Tacoma, Washington  
   August 13, 1992

21. **Intussusception: Diagnosis and Treatment**  
   Madigan Army Medical Center, Tacoma, Washington  
   August 14, 1993

22. **Practical Models for Invasive Sonography Training**  
   The Thirteenth Annual Sonic Symposium, Biloxi, Mississippi  
   August 22, 1992

23. **Techniques of Invasive Sonography**  
   The Thirteenth Annual Sonic Symposium, Biloxi, Mississippi  
   August 22, 1992

24. **Sonographic Foreign Body Localization and Guided Removal**  
   A.I. DuPont Institute Children's Hospital, Wilmington, Delaware  
   October 9, 1992

25. **Diagnosis and Treatment of Childhood Intussusception**  
   Children's Hospital Medical Center, Boston, Massachusetts  
   October 15, 1992

26. **Diagnosis and Treatment of Childhood Intussusception: The Winds of Change**  
   The Radiological Society of North America, Chicago, IL  
   November 29 - December 4, 1992
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<th>No.</th>
<th>Event Title</th>
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<td>28</td>
<td>Intussusception: Diagnosis and Treatment (Radiologic-Pathologic Correlation)</td>
<td>Armed Forces Institute of Pathology</td>
<td>Jan-Dec 1992</td>
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<td>29</td>
<td>Pediatric Radiology: An Overview For The General Medical Officer</td>
<td>Uniformed Services University of The Health Sciences</td>
<td>Jan-Dec 1992</td>
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<td>30</td>
<td>Practical Models for Invasive Sonography Training</td>
<td>St. Mary's Hospital, Richmond, Virginia</td>
<td>Jan 28-29, 1993</td>
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<td>31</td>
<td>Techniques of Invasive Sonography</td>
<td>St. Mary's Hospital, Richmond, Virginia</td>
<td>Jan 28-29, 1993</td>
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<td>32</td>
<td>Pediatric Radiology: A Technical &quot;How-To&quot;</td>
<td>St. Mary's Hospital, Richmond, Virginia</td>
<td>Jan 28-29, 1993</td>
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<td>33</td>
<td>Intussusception: Diagnosis and Treatment</td>
<td>AFIP Gastrointestinal Review Course</td>
<td>May 1-2, 1993</td>
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<td>34</td>
<td>Childhood Intussusception: Diagnosis and Treatment</td>
<td>Children's National Medical Center, Washington, D.C.</td>
<td>May 17, 1993</td>
</tr>
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<td>35</td>
<td>Air Reduction of Intussusception: A &quot;How-To&quot; Workshop</td>
<td>Children's National Medical Center, Washington, D.C.</td>
<td>May 17, 1993</td>
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<td>36</td>
<td>Diagnosis and Treatment of Childhood Intussusception: The Winds of Change</td>
<td>The American Osteopathic College of Radiology</td>
<td>May 20-23, 1993</td>
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<td>37</td>
<td>Techniques of Invasive Sonography</td>
<td>The American Osteopathic College of Radiology</td>
<td>May 20-23, 1993</td>
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<td>39</td>
<td>Diagnosis and Treatment of Childhood Intussusception: The Winds of Change</td>
<td>Central Virginia Radiology Association</td>
<td>Jun 15, 1993</td>
</tr>
</tbody>
</table>
40. **Pediatric Radiology: A Technical "How-To"**
Medical College of Virginia
Richmond, VA
June 16, 1993

41. **Diagnosis and Treatment of Intussusception: Radiologic-Pathologic Correlation**
Medical College of Virginia
Richmond, VA
June 16, 1993

42. **Diagnosis and Treatment of Childhood Intussusception: The Winds of Change**
Radiology Associates of Richmond
Richmond, VA
June 16, 1993

43. **Pediatric Radiology: A Technical "How-To"**
Radiology Associates of Richmond
Richmond, VA
June 16, 1993

44. **Childhood Intussusception: Radiologic-Pathologic -Clinical Correlation**
Children's Hospital Medical Center
Cincinnati, Ohio
July 19, 1993

45. **Childhood Intussusception: Treatment Options, Rationale, and Techniques**
Children's Hospital Medical Center
Cincinnati, Ohio
July 20, 1993

46. **Pediatric Radiology: A Technical "How-To"**
Children's Hospital Medical Center
Cincinnati, Ohio
July 20-21, 1993

47. **Techniques of Interventional Ultrasound**
Current Concepts in Radiology Symposium
Tacoma, WA
19 August, 1993

48. **Pediatric Radiology: A Technical "How-To"**
Current Concepts in Radiology Symposium
Tacoma, WA
20 August, 1993

49. **Diagnosis and Treatment of Childhood Intussusception: The Winds of Change**
Refresher Course Moderator
The Radiological Society of North America, Chicago, IL
November 28- December 3, 1993

50. **Techniques of Freehand Invasive Sonography ("Hands-On " Workshop)**
Workshop Moderator
The Radiological Society of North America, Chicago, IL
November 28- December 3, 1993
51. **Techniques of Invasive Breast Sonography ("Hands-On" Workshop)**  
   Workshop Moderator  
   The Radiological Society of North America, Chicago, IL  
   November 28- December 3, 1993

52. **Intussusception: Diagnosis and Treatment (Radiologic-Pathologic Correlation)**  
   Armed Forces Institute of Pathology  
   Radiologic-Pathologic Review Courses  
   January-December, 1993

53. **Pediatric Radiology: An Overview For The General Medical Officer**  
   Uniformed Services University of The Health Sciences  
   MS IV Radiology Courses  
   January- December, 1993

54. **Pediatric Radiology: A Technical "How-To"**  
   Eisenhower Medical Center  
   Palm Springs, CA  
   4-5 November, 1993

55. **Emergency Concepts in Pediatric Radiology**  
   Eisenhower Medical Center  
   Palm Springs, CA  
   4-5 November, 1993

56. **Techniques of Interventional Ultrasound**  
   Eisenhower Medical Center  
   Palm Springs, CA  
   4-5 November, 1993

57. **Intussusception: Diagnosis and Treatment (Radiologic-Pathologic Correlation)**  
   Armed Forces Institute of Pathology  
   Radiologic-Pathologic Review Courses  
   January-December, 1994

58. **Pediatric Radiology: An Overview For The General Medical Officer**  
   Uniformed Services University of The Health Sciences  
   MS IV Radiology Courses  
   January- December, 1994

59. **Intussusception: Diagnosis and Treatment (Radiologic-Pathologic Correlation)**  
   Department of Radiology  
   Boston University Hospital  
   29 March, 1994

60. **Intussusception: Diagnosis and Treatment (Radiologic-Pathologic Correlation)**  
    The Children's Hospital  
    Boston, MA  
    30 March, 1994

61. **Pediatric Radiography: A Technical "How-To"**  
    Roentgen's RAYve Review: A Diagnostic Seminar  
    St. Luke's Medical Center, Milwaukee, Wisconsin  
    7 May, 1994
62. **Health Facilities Planning and Diagnostic Radiology: A Coordinated Care Force Concept**  
1994 Health Facilities Planning/Health Care Logistics Seminar  
Baltimore, MD  
17 May, 1994

63. **The Role of the Radiologist in Managed Health Care**  
American Osteopathic College of Radiology-Annual Meeting  
Las Vegas, Nevada  
10 October, 1994

64. **Cost Effective Strategies of Pediatric Radiology in Managed Health Care**  
American Osteopathic College of Radiology-Annual Meeting  
Las Vegas, Nevada  
11 October, 1994

65. **Techniques of Freehand Invasive Sonography ("Hands-On " Workshop)**  
Workshop Moderator  
The Radiological Society of North America, Chicago, IL  
November 27- December 2, 1994

The Radiological Society of North America, Chicago, IL  
November 27- December 2, 1994

67. **Intestinal Intussusception: A Radiologic-Pathologic Correlation**  
Massachusetts General Hospital, Boston, MA  
21 December, 1994

68. **Current State of the Art of Childhood Intussusception Research**  
Massachusetts General Hospital, Boston, MA  
21 December, 1994

69. **Intussusception: Diagnosis and Treatment (Radiologic-Pathologic Correlation)**  
Armed Forces Institute of Pathology  
Radiologic-Pathologic Review Courses  
January-December, 1995

70. **Pediatric Radiology: An Overview For The General Medical Officer**  
Uniformed Services University of The Health Sciences  
MS IV Radiology Courses  
January- December, 1995

71. **Concepts in Emergency Pediatric Radiology**  
Children's Hospital, Columbus, OH  
2 March, 1995

72. **Techniques of Freehand Invasive Sonography ("Hands-On " Workshop)**  
Society of Cardiovascular and Interventional Radiology, Ft. Lauderdale, FL  
March 26-31, 1995

73. **Childhood Intussusception: Experimental and Clinical Correlates**  
St. Christopher's Children's Hospital, Philadelphia, PA  
11 May, 1995

74. **Air Reduction of Intussusception: Practical Management Concepts**  
St. Christopher's Children's Hospital, Philadelphia, PA  
12 May, 1995
75. **Childhood Intussusception: Management Perspectives in 1995**  
   Surgical Grand Rounds, Children's Hospital, Columbus, OH  
   6 September, 1995

76. **Invasive Breast Ultrasound Procedures ("Hands-On "Workshop)**  
   Course Moderator  
   Stanford Breast Imaging and Intervention Conference, Washington, DC  
   10-12 September, 1995

77. **Techniques of Freehand Invasive Sonography ("Hands-On " Workshop)**  
   Course Moderator  
   The Radiological Society of North America, Chicago, IL  
   26 November-1 December, 1995

78. **Functional Team Care in Radiological Healthcare**  
   American Radiological Nurses Association, Chicago, IL  
   27 November, 1995

79. **Pediatric Radiology: Tools of the Trade**  
   7th Annual Refresher Course in Pediatric Radiology, Cincinnati, OH  
   16-17 February, 1996

80. **Intussusception: An Overview**  
   Techniques in Pediatric Radiology, Refresher Course in Pediatric Radiology, Cincinnati, OH  
   16-17 February, 1996

81. **Functional Team Care in Radiological Healthcare**  
   The Association of Vascular and Interventional Radiographers, Seattle, WA  
   4 March, 1996

82. **Pediatric Interventional Radiology: Unique Aspects of Care for Infants and Children**  
   The Association of Vascular and Interventional Radiographers, Seattle, WA  
   4 March, 1996

83. **Hands-On Ultrasound Workshop**  
   Society of Cardiovascular and Interventional Radiology, Seattle, WA  
   6 March, 1996

84. **Hands-On Ultrasound Workshop**  
   Course Moderator  
   Society of Cardiovascular and Interventional Radiology, Seattle, WA  
   7 March, 1996

85. **Childhood Intussusception: Management Perspectives in 1996**  
   Pediatric Grand Rounds  
   Children's Hospital, Columbus, OH  
   28 March, 1996

86. **Current Concepts in Pediatric Radiology**  
   Lounge and Learn Conference  
   Children's Hospital, Columbus, Ohio  
   29 March, 1996
<table>
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<tr>
<th>No.</th>
<th>Event Description</th>
<th>Details</th>
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<tr>
<td>87.</td>
<td>Techniques of Freehand Invasive Sonography (&quot;Hands-On &quot; Workshop)</td>
<td>Course Moderator&lt;br&gt;The Radiological Society of North America, Chicago, IL&lt;br&gt;2-6 December, 1996</td>
</tr>
<tr>
<td>88.</td>
<td>Childhood Intussusception: Management Prospectives in 1996</td>
<td>Emergency Medicine Grand Rounds&lt;br&gt;Children's Hospital, Columbus, Ohio&lt;br&gt;7,18 November-9 December, 1996</td>
</tr>
<tr>
<td>89.</td>
<td>Advances in Pediatric Radiology</td>
<td>Children's Hospital, Columbus, Ohio&lt;br&gt;Grand Rounds&lt;br&gt;13 February, 1997</td>
</tr>
<tr>
<td>90.</td>
<td>Pediatric Radiology: New PICC's for 1997</td>
<td>Children's Hospital, Columbus, Ohio&lt;br&gt;Pediatric Pearls Conference&lt;br&gt;6 March, 1997</td>
</tr>
<tr>
<td>92.</td>
<td>&quot;Hands-on&quot; Interventional Ultrasound</td>
<td>Course Moderator&lt;br&gt;Society of Cardiovascular and Interventional Radiology&lt;br&gt;Washington, D.C.&lt;br&gt;13 March, 1997</td>
</tr>
<tr>
<td>93.</td>
<td>Pediatric Radiology: A Technical “How-To”</td>
<td>Central Ohio Society of Radiologic Technologists&lt;br&gt;Columbus, Ohio&lt;br&gt;9 April, 1997</td>
</tr>
<tr>
<td>94.</td>
<td>Techniques of Invasive Sonography in Infants and Children</td>
<td>Course Moderator&lt;br&gt;The Society of Pediatric Radiology&lt;br&gt;St. Louis, MO&lt;br&gt;15 May, 1997</td>
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<tr>
<td>95.</td>
<td>Emergency Concepts in Pediatric Radiology</td>
<td>Ohio Osteopathic Association Convention&lt;br&gt;Cleveland, Ohio&lt;br&gt;21 June, 1997</td>
</tr>
<tr>
<td>96.</td>
<td>Pediatric Sonographic Imaging and Intervention: Imaging Excellence for Effective Care Direction</td>
<td>ATL Learning Center&lt;br&gt;Bothell, WA&lt;br&gt;14-16 July, 1997</td>
</tr>
</tbody>
</table>
97. **Pediatric Sonographic-Pathologic Correlation: A Case Study Approach**
   ATL Learning Center
   Bothell, WA
   14-16 July, 1997

98. **Soft Tissue Foreign Bodies: Sonographic Localization, Characterization, and Guided Removal**
   ATL Learning Center
   Bothell, WA
   14-16 July, 1997

99. **Pediatric Radiography and Fluoroscopy: Tools of the Trade**
    Marion General Hospital
    Marion, OH
    31 July, 1997

100. **Essentials of Radiology for the Primary Care Nurse Practitioner**
     Otterbein College
     Westerville, OH
     11 August, 1997

101. **Pediatric Radiology: Clinical Case Conference**
     Visiting Professor
     Medical University of Ohio
     Toledo, OH
     17 September, 1997

102. **Techniques of Invasive Sonography: Principles, Applications and Learning Systems:**
     Guest Lecturer
     Northwestern Ohio Radiological Society
     Toledo, OH
     17 September, 1997

103. **Techniques of Invasive Sonography: A “How-To” Course**
     American Osteopathic College of Radiology
     San Francisco, CA
     15-19 October, 1997

104. **Emergency Concepts in Pediatric Radiology**
     American Osteopathic College of Radiology
     San Francisco, CA
     15-19 October, 1997

105. **Pediatric Head and Neck Radiology for the General Radiologists**
     American Osteopathic College of Radiology
     San Francisco, CA
     15-19 October, 1997

106. **Practical Issues in Pediatric Radiography and Fluoroscopy**
     American Osteopathic College of Radiology
     San Francisco, CA
     15-19 October, 1997
107. **Pediatric Radiology: A Technical “How-To”**  
Guest Lecturer  
North Central Technical College  
Mansfield, OH  
15 November, 1997

Course Moderator  
The Radiological Society of North America  
Chicago, IL  
30 November - 5 December, 1997

109. **Pediatric Liver Tumors: Radiologic-Pathologic Correlation**  
Armed Forces Institute of Pathology  
Radiologic-Pathologic Correlation Course 1998 Sessions  
Washington, DC

110. **Current Concepts in Radiology for Primary Care Physicians**  
Course Oderator  
Columbus, Ohio 25 February, 1998

111. **Invasive Sonography “Hands-On” Course**  
Course Moderator/Speaker  
Society for Cardiovascular and Interventional Radiology Meeting  
San Francisco, CA 28 February - 5 March, 1998

112. **Emergency Concepts in Pediatric Radiology**  
Visiting Professor  
Western Pennsylvania Hospital, Pittsburgh, PA 12 March, 1998

113. **Pediatric Radiology Board Review**  
Visiting Professor  
Western Pennsylvania Hospital, Pittsburgh, PA 12-13 March, 1998

114. **Pediatric Head and Neck Radiology for the General Radiologist**  
Visiting Professor  
Western Pennsylvania Hospital, Pittsburgh, PA 13 March, 1998

115. **Techniques of Pediatric Radiography**  
Ohio Society of Radiologic Technologists - Annual Meeting  
Columbus, Ohio 28 March, 1998

116. **Techniques of Pediatric Fluoroscopy**  
Ohio Society of Radiologic Technologists - Annual Meeting  
Columbus, Ohio 28 March, 1998

117. **Techniques of Invasive Sonography**  
Course Director  
A “Hands-On” Workshop. American College of Osteopathic Radiology, Annual Meeting  
Kansas City, MO 14-17 May, 1998
118. **Pediatric Abdominal Emergencies: Radiologic Management Strategies**  
Course Moderator/Speaker  
Practical Aspects of Diagnostic Radiology & Medical Imaging  
Vanderbilt University School of Medicine  
Jackson Hole, WY 30 July - 2 August, 1998

119. **Workshop: Interventional Ultrasound Techniques**  
Course Moderator/Speaker  
Practical Aspects of Diagnostic Radiology & Medical Imaging  
Vanderbilt University School of Medicine  
Jackson Hole, WY 30 July - 2 August, 1998

120. **Practical Techniques in Pediatric Radiography and Fluoroscopy**  
Course Moderator/Speaker  
Practical Aspects of Diagnostic Radiology & Medical Imaging  
Vanderbilt University School of Medicine  
Jackson Hole, WY 30 July - 2 August, 1998

121. **Childhood Intussusception: Diagnostic and Therapeutic Management Strategies**  
Visiting Professor, Department of Radiology  
The Mercy Hospital of Pittsburgh  
19 August, 1998

122. **Radiology Resident Board Review**  
Visiting Professor, Department of Radiology  
The Mercy Hospital of Pittsburgh  
19 August, 1998

123. **Childhood Intussusception: Principles and Practical Techniques for Radiologic Technologists**  
Visiting Professor, Department of Radiology  
The Mercy Hospital of Pittsburgh  
19 August, 1998

124. **Diagnostic Radiology Review**  
Board Review Course - ACEP  
Columbus, Ohio - 13 September, 1998

125. **Pyloric Stenosis: Sonographic Diagnosis and Care**  
Course Moderator/Speaker  
The Society of Diagnostic Medical Sonographers  
Orlando, Florida 19 September, 1998

126. **Soft-Tissue Foreign Bodies: Diagnostic and Therapeutic Radiological Management**  
Course Moderator/Speaker  
The Society of Diagnostic Medical Sonographers  
Orlando, Florida 19 September, 1998

127. **Emergency Interventional Radiology in the Pediatric Chest and Abdomen**  
Course Moderator/Speaker  
American Osteopathic College of Radiology Annual Convention  
Tucson, Arizona 14 October, 1998
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<td>129</td>
<td>Introduction to Clinical Radiology</td>
<td>Course Moderator/Speaker Otterbein College - Family Practice Nurse Practitioner Program Westerville, Ohio 20 October, 1998</td>
</tr>
<tr>
<td>130</td>
<td>Childhood Intussusception: Successes and Failures of Air Enema Reduction</td>
<td>Visiting Professor Lecture Riley Children’s Hospital Indianapolis, Indiana 27 October, 1998</td>
</tr>
<tr>
<td>131</td>
<td>Freehand Invasive Sonography: Principles, Applications and Learning Systems</td>
<td>Visiting Professor Lecture Riley Children’s Hospital Indianapolis, Indiana 27 October, 1998</td>
</tr>
<tr>
<td>132</td>
<td>Radiology Resident Board Review</td>
<td>Visiting Professor Lecture Riley Children’s Hospital Indianapolis, Indiana 27 October, 1998</td>
</tr>
<tr>
<td>133</td>
<td>Emergency Interventional Radiology in Pediatric Chest and Abdomen</td>
<td>Visiting Professor Lecture Toronto Interventional Radiology Symposium The Hospital for Sick Children Toronto, Ontario 4 November, 1998</td>
</tr>
<tr>
<td>134</td>
<td>Pediatric Abdominal Emergencies: Radiologic Management Strategies</td>
<td>Visiting Professor Lecture Toronto Interventional Radiology Symposium The Hospital for Sick Children Toronto, Ontario 4 November, 1998</td>
</tr>
<tr>
<td>135</td>
<td>Radiologic Management of Pediatric Airway Disorders</td>
<td>Visiting Professor Lecture 5th Annual Interventional/Vascular Course The Hospital for Sick Children Toronto, Ontario 4 November, 1998</td>
</tr>
<tr>
<td>138</td>
<td>The Value, Safety and Efficacy of Temporary Percutaneous Nephrostomy Drainage in Young Children</td>
<td>The Society for Pediatric Urology and The American Urological Association Annual Meeting Dallas Texas 1 May, 1998</td>
</tr>
</tbody>
</table>
139. **Invasive Sonography**  
    Course Moderator/Speaker  
    American Osteopathic College of Radiology  
    1999 Mid year Conference  
    San Antonio, Texas 20-23 May, 1999

140. **Radiologic Management of Soft Tissue Foreign Bodies**  
    Course Moderator/Speaker  
    American Osteopathic College of Radiology  
    1999 Mid year Conference  
    San Antonio, Texas 20-23 May, 1999

141. **Techniques of Freehand Invasive Sonography: A “Hands’On” Course-#1**  
    Course Moderator/Speaker  
    American Osteopathic College of Radiology  
    1999 Mid year Conference  
    San Antonio, Texas 20-23 May, 1999

142. **Soft Tissue Foreign Bodies: Diagnostic and Therapeutic Radiological Management**  
    Visiting Professor Lecture  
    Massachusetts General Hospital  
    Department of Radiology  
    Boston, Massachusetts 16 May, 1999

143. **Techniques in Invasive Ultrasound “Hands-On’ Course**  
    Visiting Professor Seminar  
    Massachusetts General Hospital  
    Department of Radiology  
    Boston, Massachusetts 16 May, 1999

144. **Pediatric Trauma Radiology**  
    Course Moderator/Speaker  
    North Central Ohio Society of Radiology Technologists  
    North Central Ohio Technical College  
    Mansfield, Ohio 24 April, 1999

145. **Techniques of Freehand Invasive Sonography: A “Hands’On” Course**  
    Visiting Professor  
    Walter Reed Army Medical Center  
    Washington D. C.  
    January 12, 2000

146. **Renal Cystic Disease: Sonographic Pathologic Collimators**  
    Visiting Professor  
    Walter Reed Army Medical Center  
    Washington D. C.  
    January 13, 2000

147. **Pediatric Liver Tumor: Radiologic Pathologic Correlation**  
    Visiting Scientist Lecture  
    Armed Forces Institute of Pathology  
    Washington D. C.  
    January – December, 2000 Courses
148. **Cervical Spine Abnormalities In Down Syndrome: Radiologic Correlates**  
Course Moderator/Speaker  
Down Syndrome Association  
Dublin, Ohio  
January 24, 2000

149. **Current Concerns of Pediatric Emergencys Room Radiology**  
Invited Lecture/Speaker  
The Northwestern Ohio Radiological Society  
Toledo, Ohio  
February 16, 2000

150. **Pediatric Radiology Board Preparation**  
Visiting Professor  
Medical University of Ohio, Department of Radiology  
Toledo, Ohio  
February 16, 2000

151. **Current Concepts of Emergency Pediatric Radiology**  
Visiting Professor  
Medical University of Ohio, Department of Radiology  
Toledo, Ohio  
February 16, 2000

152. **Using Interventional Radiology in the Pediatric Emergency Department**  
Course Moderator/Speaker  
Expanding the Practice of Emergency Medicine: Providing Emergency Care for the Child and Young Adult  
Atlanta, Georgia  
February 26, 2000

153. **Challenging Pediatric Radiographs**  
Course Moderator/Speaker  
Expanding the Practice of Emergency Medicine: Providing Emergency Care for the Child and Young Adult  
Atlanta, Georgia  
February 26, 2000

154. **Correlative Imaging of Pediatric Chest Masses**  
American Osteopathic College of Radiology Annual Conference, Scottsdale, AZ  
September 20-24, 2000

155. **Emergency Concepts in Pediatric Chest Radiology**  
American Osteopathic College of Radiology Annual Conference, Scottsdale, AZ  
September 20-24, 2000

156. **2000 Medical Staff Education Series**  
Course Moderator/Speaker  
Update On Pediatric Radiology  
Bethesda Hospital, Zanesville, Ohio  
October 10, 2000
157. **Ultrasound-Guided Injection of Small Joints of the Feet in Children with Juvenile Rheumatoid Arthritis (JRA)**
Course Moderator/Speaker
American College of Rheumatology
Philadelphia, PA
October 30, 2000

158. **Pediatric Hip Sonography: A Practical Update**
Course Moderator/ Speaker
Annual Ultrasound Update Course– United Hospitals
St. Paul MN
November 4, 2000

159. **Pediatric Spine Sonography: Diagnosis and Guided Intervention**
Course Moderator/ Speaker
Annual Ultrasound Update Course– United Hospitals
St. Paul MN
November 4, 2000

160. **Hypertrophic Pyloric Stenosis: Sonographic Diagnosis and Care Management**
Course Moderator/ Speaker
Annual Ultrasound Update Course– United Hospitals
St. Paul MN
November 4, 2000

161. **Infectious Disease: Radiologic Correlation in the Chest and GI Tract**
Course Moderator/ Speaker
Ohio University College of Medicine
Athens, OH
July 6, 2001

162. **Radiologic-Pathologic Correlation of Tumors in Children’s Hospital**
Course Moderator/ Speaker
Ohio University College of Medicine
Athens, OH
July 6, 2001

163. **Pediatric Critical Care “Do you See What I See?” Pediatric Radiology Review**
Course Moderator/ Speaker
The 2nd annual Medflight Symposium: Perspectives in Emergency & Critical Care
Wyndham Dublin Hotel
Columbus, OH
September 15, 2001

164. **Soft Tissue and Intraarticular Foreign Bodies: Outcomes with Ultrasound-Guided Removal in Children**
Course Moderator/ Speaker
Musculoskeletal Ultrasound Conference 2001
Washington DC
October 9, 2001
165. **Ultrasound-Guided Injection of Small Joints of the Feet in Children with Juvenile Rheumatoid Arthritis (Jra)**  
Course Moderator/Speaker  
Musculoskeletal Ultrasound Conference 2001  
Washington DC  
October 9, 2001

166. **Pediatric head and Neck Masses: Radiologic Diagnosis and Intervention**  
Course Moderator/Speaker  
Medical University of Ohio  
Toledo, OH  
February 20, 2002

167. **Radiology for the Family Nurse Practitioner**  
Course Moderator/Speaker  
Otterbein College  
Westerville, OH  
March 7, 2002

168. **Hypertrophic Pyloric Stenosis**  
Course Moderator/Speaker  
Minnesota Society of Diagnostic Ultrasound  
22nd Annual Spring Seminar  
Brooklyn Park, MN  
23-24 March, 2002

169. **Ultrasound Guided Foreign Body Removal**  
Course Moderator/Speaker  
Minnesota Society of Diagnostic Ultrasound  
22nd Annual Spring Seminar  
Brooklyn Park, MN  
23-24 March, 2002

170. **Pediatric Radiographic and Fluoroscopic Techniques and Tools**  
Course Moderator/Speaker  
Pediatric Imaging and Care: Techniques and Concepts for Excellence  
Columbus, OH  
April 13, 2002

171. **Pediatric Radiographic and Fluoroscopic Toolbag: A “Hands-on” Course**  
Course Moderator/Speaker  
Pediatric Imaging and Care: Techniques and Concepts for Excellence  
Columbus, OH  
April 13, 2002

172. **The Human Challenge of Pediatric Imaging and Care**  
Course Moderator/Speaker  
Pediatric Imaging and Care: Techniques and Concepts for Excellence  
Columbus, OH  
April 13, 2002

173. **Competency Maintenance Training System for Pediatric US Guided Hip Arthrocentesis**  
Course Moderator/Speaker  
The Society for Pediatric Radiology 2002  
Philadelphia, PA  
May 1, 2002
174. **Intraarticular Steroid Injections in Small Foot Joints of Patients with JRA**
   Course Moderator/Speaker
   The Society for Pediatric Radiology 2002
   Philadelphia, PA
   May 1, 2002

175. **Dual-Drug, Time-Limited Contact Sclerotherapy of Cervicofacial Lymphangiomas**
   Course Moderator/Speaker
   Head and Neck Surgery/Rhinology and Paranasal Sinuses
   American Society of Pediatric Otolaryngology
   Boca Raton, FL
   May 13, 2002

176. **Childhood Intussusception: radiologic, pathologic and surgical correlation**
   Course Moderator/Speaker
   Oregon Radiologic Society 2002
   Portland, OR
   May 16, 2002

177. **Pediatric Liver Tumors: Radiologic and Pathologic Correlation**
   Course Moderator/Speaker
   Oregon Radiologic Society 2002
   Portland, OR
   May 16, 2002

178. **Pediatric Cystic Renal Disease: Radiologic and Pathologic Correlation**
   Course Moderator/Speaker
   Oregon Radiologic Society 2002
   Portland, OR
   May 16, 2002

179. **Soft Tissue Foreign Bodies: Radiologic Diagnosis & Interventional Management**
   Course Moderator/Speaker
   Oregon Radiologic Society 2002
   Portland, OR
   May 16, 2002

180. **Success is a choice.....For you and for others**
    Invited Speaker
    Academic Achievement Awards Banquet
    Bloom Carroll High School
    Carroll, OH
    May 23, 2002

181. **Emergency Concepts in Pediatric Radiology**
    Course Moderator/Speaker
    National Telemedicine Lecture
    AOCR
    July 10, 2002

182. **Pediatric Hip Arthrocentesis: A “Hands-On” Course**
    Visiting Professor
    Children's Hospital
    Boston, MA
    July-1 August, 2002
183. **Soft-Tissue Foreign Bodies: Sonographic Diagnosis, Localization, and Guided Removal**  
Visiting Professor  
Children's Hospital  
Boston, Ma  
31 July-1 August, 2002

184. **Foreign Bodies: Diagnosis & Retrieval**  
Course Moderator/Speaker  
12th Annual Musculoskeletal Ultrasound Conference  
Brussels, Belgium  
August-September 4, 2002

185. **Sonography of the Pediatric Hip and Spine**  
SDMS 19th Annual Conference, Hilton Atlanta Hotel, Atlanta, GA,  
October 3-6, 2002

186. **Soft Tissue Foreign Bodies: Sonographic Identification, localization and guided removal**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2002

187. **Pediatric Spine Including Interventional**  
Course Moderator/Speaker  
32nd Annual Scientific Meeting of the Australasian Society of Ultrasound In Medicine  
Gold Coast, Australia  
19-22 September, 2002

188. **Clubfoot**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia

189. **Ultrasound Guided Injections of Joints and Tendon Sheaths in Rheumatoid Arthritis**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2002

190. **Ultrasound for Foreign Bodies**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2002

191. **Interventional Radiology in Pediatric Abodmen**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2002

192. **Pediatric Musculoskeletal Interventional Radiology: New Concepts**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2002
193. **Pediatric Radiology: Do You See What I See?**  
Course Moderator/Speaker  
Children's Hospital  
Patient Care Services  
Columbus, OH  
October 24, 2002

194. **Radiologic Care of the Pediatric Patient: It's More Than Just Pictures**  
2002 School Health Update, Columbus Convention Center,  
November 1, 2002

195. **The Basics of Radiology Film Interpretation for the Nurse Practitioner**  
Course Moderator/Speaker  
Otterbein College  
Westerville, OH  
March 4, 2003

196. **Pediatric Head & Neck/Diagnosis and Intervention**  
Course Moderator/Speaker  
Minnesota Society of Diagnostic Ultrasound  
23rd Annual Spring Seminar  
Brooklyn Park, MN  
30 March, 2003

197. **Abdominal Masses in Children**  
Course Moderator/Speaker  
Minnesota Society of Diagnostic Ultrasound  
23rd Annual Spring Seminar  
Brooklyn Park, MN  
30 March, 2003

198. **Evaluation of Pediatric Hips**  
Course Moderator/Speaker  
Minnesota Society of Diagnostic Ultrasound  
23rd Annual Spring Seminar  
Brooklyn Park, MN  
30 March, 2003

199. **Interventional Sonography of Chest & Abdomen**  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Dearborn, MI  
10-13 April, 2003

200. **Selected Techniques for Musculoskeletal Interventional Sonography**  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Dearborn, MI  
10-13 April, 2003

201. **Sonographic Diagnosis & Interventional of Soft Tissue Foreign Bodies**  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Dearborn, MI  
13 April, 2003
202. Sonography of Abdominal Masses in Children  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Dearborn, MI  
10-13 April, 2003

203. Renal Cystic Disease: Sonographic & Patologic Correlation  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Dearborn, MI  
10-13 April, 2003

204. Sonography of Pediatric GI Masses  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Dearborn, MI  
10-13 April, 2003

205. Pneumonia, Bronchitis and Chest-tubes  
Course Moderator/Speaker  
21st Annual Pediatric Infectious Diseases Conference  
Children's Hospital, Columbus, OH,  
25 September, 2003

206. Soft Tissue Foreign Bodies: Diagnostic and Therapeutic Radiological Management  
Course Moderator/Speaker  
Musculoskeletal Ultrasound 13th Annual Conference  
Washington DC  
7-9 October, 2003

207. Dynamic Sonographic Examination of the Congenital Clubfoot  
Course Moderator/Speaker  
Musculoskeletal Ultrasound 13th Annual Conference  
Washington DC  
7-9 October, 2003

208. Musculoskeletal Interventional Sonographic Procedires: A “Hands-on” Course  
Course Moderator/Speaker  
Musculoskeletal Ultrasound 13th Annual Conference  
Washington DC  
7-9 October, 2003

209. Organizational Structures, Affiliations and Hybrids  
Course Moderator/Speaker  
SCORCH 2003 Annual Meeting  
Chicago, IL  
10-11 October, 2003

210. Radiological Management of Common Pediatric Abdominal Emergencies  
Course Moderator/Speaker  
AOCR 2003 Annual Convention “Proficiency in Radiology”  
Miami, FL  
21-25 October, 2003
211. The Radiological Management of Pediatric Chest Masses  
Course Moderator/Speaker  
AOCR 2003 Annual Convention “Proficiency in Radiology”  
Miami, FL  
21-25 October, 2003

212. Pediatric Head and Neck Masses: Radiologic Diagnosis and Intervention  
Course Moderator/Speaker  
AOCR 2003 Annual Convention “Proficiency in Radiology”  
Miami, FL  
21-25 October, 2003

213. Pediatric Head and Neck Masses: Radiologic Diagnosis and Intervention  
Visiting Professor  
Children’s Hospital  
Boston, Ma  
11 November, 2003

214. Techniques of Pediatric Invasive Sonography: A Hands On” Course  
Visiting Professor  
Children’s Hospital  
Boston, Ma  
11 November, 2003

215. “Pediatric Pneumonia: Radiologic-Pathologic ‘Correlation’”  
Course Moderator/Speaker  
Riverside Methodist Hospital  
Columbus, OH  
21 January, 2004

216. Radiographic-Pathologic Correlation: Case Discussions  
Course Moderator/Speaker  
Pediatric Imaging and Care: Techniques and Concepts for Excellence  
Columbus, OH  
5 March, 2004

217. Techniques of Invasive Sonography (Hands On Workshop)  
Course Moderator/Speaker  
Northwestern Ohio Radiological Society  
Toledo, OH 43623  
21 April, 2004

218. Techniques of Pediatric Invasive Sonography: A “Hands On” Course  
Course Moderator/Speaker  
AMEDD Radiology Course  
Current Concepts in Imaging  
Washington DC  
15 April, 2004

219. “Healing Wounds on the Tigris: Regrowth of Medicine in Iraq  
Course Moderator/Speaker  
Stecker Scholar Presentation  
Children’s Hospital, Columbus, OH  
14 June, 2004
220. “Radiology Update”
Course Moderator/Speaker
Grand Rounds
Children’s Hospital, Columbus, OH
17 June, 2004

221. Pediatric Sonography: Unique Challenges in the Hip and Spine”
Course Moderator/Speaker
Riverside Family Practice
Columbus, OH
18 August, 2004

222. Head & Neck Masses
Visiting Professor
Grandview Hospital, Dayton, OH
14 September, 2004

223. Pediatric Neck Masses
Course Moderator/Speaker
RPAC Education Day
Victorian Village Health Center
Columbus, OH
15 September, 2004

224. Pediatric Head & Neck Masses: Radiologic Diagnosis & Intervention
Visiting Professor
The Atis K. Freimanis Radiology Visiting Radiology Program
Michigan State University, East Lansing, MI
28 September, 2004

225. Radiology Board Review – Case Conference
Visiting Professor
The Atis K. Freimanis Radiology Visiting Radiology Program
Michigan State University, East Lansing, MI
28 September, 2004

226. The Radiological Management of Soft Tissue Foreign Bodies: Diagnosis and Intervention
American Osteopathic College of Radiology
Distance Learning Program
Teleconference
29 September, 2004

227. Sonography of the Congenital Clubfoot: A “Hands on” Symposium
Pediatric Musculoskeletal Ultrasound Symposium
Course Moderator/Speaker
Giannina Gaslini Pediatric Hospital
Genoa, Italy
16 October, 2004

228. Sonographic Management of Soft Tissue Foreign Bodies
14th Annual Conference on Musculoskeletal Ultrasound
Musculoskeletal Ultrasound Society
Course Moderator/Speaker
Bologna, Italy
17-21 October, 2004
229. **Techniques of Invasive Sonography: Advanced Workshop**  
14th Annual Conference on Musculoskeletal Ultrasound  
Musculoskeletal Ultrasound Society  
Course Moderator/Speaker  
Bologna, Italy  
17-21 October, 2004

230. **Iraqi Medical Specialty Mission in Basra’s Children’s Hospital**  
Course Moderator/Speaker  
Central Ohio Perianesthesia Nurses Association (COPANA)  
Columbus Children’s Hospital  
11 November 2004

231. **Healing Wounds on the Tigris: Regrowth of Medicine in Iraq**  
Course Moderator/Speaker  
Central Ohio Pediatric Society (COPS)  
Columbus, OH  
17 November 2004

232. **Pediatric Head and Neck Masses: State of the Art in Diagnosis and Intervention**  
Visiting Professor  
Grand Rounds  
Children’s Medical Center  
Dayton, OH  
2 February, 2005

233. **Basic Interventional Musculoskeletal Ultrasound**  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Chicago, IL  
16-17 April, 2005

234. **Techniques of Invasive Musculoskeletal Sonography – “A Hands-on Workshop”**  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Chicago, IL  
16-17 April, 2005

235. **Unique Aspects of Pediatric Fractures**  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Chicago, IL  
16-17 April, 2005

236. **Techniques of Invasive Sonography – “A Hands-on Course”**  
Course Moderator/Speaker  
United States Army Medical Department  
Current Concepts in Imaging Conference  
20 April, 2005

237. **Interventional Radiology: Current State of the Art**  
Ped Potpourri/Doctors Hospital  
Columbus, OH  
30 April, 2005
238. **Pediatric Head & Neck Masses: State of the Art Diagnosis and Intervention**  
University of Massachusetts  
Visiting Professor Grand Rounds  
16 May, 2005

239. **Pediatric Radiology Unknown Case Conference**  
University of Massachusetts  
Visiting Professor Lecture  
16 May, 2005

240. **Techniques of Freehand Invasive Sonography: A “Hands on” Course**  
University of Massachusetts  
Visiting Professor Lecture  
16 May, 2005

241. **Pyloric Stenosis**  
SDMS Annual Conference  
Course Moderator/Speaker  
Dallas, TX  
8-9 October, 2005

242. **Pediatric Sonography: Unique Challenges in the Hips & Spine**  
SDMS Annual Conference  
Course Moderator/Speaker  
Dallas, TX  
8-9 October, 2005

243. **Pediatric Abdominal Masses-Characteristics with Diagnostic Sonography**  
SDMS Annual Conference  
Course Moderator/Speaker  
Dallas, TX  
8-9 October, 2005

244. **Head & Neck Chronicle Masses in Children: Diagnosis & Treatment**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2005

245. **Invasive Ultrasound Techniques**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2005

246. **Pediatric Hip & Spine Ultrasound**  
Course Moderator/Speaker  
Interamerican College of Radiology  
Cartagena, Columbia  
12-16 October, 2005
247. **Pediatric Ultrasound: Pylorus, Hips and Spine**  
    Course Moderator/Speaker  
    AOCR 2005 Annual Convention “Current Practice and Trends in Medical Imaging”  
    AOA Unified Convention  
    Orlando, FL  
    23-27 October, 2005

248. **Pediatric Infections: Pneumonia, Appendicitis and UTI**  
    Course Moderator/Speaker  
    AOCR 2005 Annual Convention “Current Practice and Trends in Medical Imaging”  
    AOA Unified Convention  
    Orlando, FL  
    23-27 October, 2005

249. **Pediatrci Head and Neck Masses**  
    Course Moderator/Speaker  
    AOCR 2005 Annual Convention “Current Practice and Trends in Medical Imaging”  
    AOA Unified Convention  
    Orlando, FL  
    23-27 October, 2005

250. **Pediatric Abdominal Masses**  
    Course Moderator/Speaker  
    AOCR 2005 Annual Convention “Current Practice and Trends in Medical Imaging”  
    AOA Unified Convention  
    Orlando, FL  
    23-27 October, 2005

251. **AOCP Radiology Workshop**  
    Course Moderator/Speaker  
    AOCR 2005 Annual Convention “Current Practice and Trends in Medical Imaging”  
    AOA Unified Convention  
    Orlando, FL  
    23-27 October, 2005

252. **Ultrasound Guided Workshops**  
    Course Moderator/Speaker  
    Musculoskeletal Ultrasound Society Annual Convention  
    Orlando, FL  
    6-8 November, 2005

253. **Exploring Your Future in Radiology: Interventional Sonography**  
    Course Moderator/Speaker  
    Radiological Society of North America  
    Student Outreach Series  
    1 December, 2005

254. **Techniques of Pediatric Invasive Sonography: A “Hands-on” Course**  
    Visiting Professor  
    Children's Hospital  
    Boston, Ma  
    7-8 December, 2005
255. Radiological Diagnosis & Intervention for Common Pediatric Infections
   Visiting Professor
   Children's Hospital
   Boston, Ma
   7-8 December, 2005

256. Pediatric Hip Disorders: Radiologic Pathologic Correlation
   Course Moderator/Speaker
   Children's Hospital
   Boston, Ma
   7-8 December, 2005

257. Innovations in Radiology
   Course Moderator/Speaker
   Central Ohio Perianesthesia Nurses Association (COPANA)
   Columbus Children's Hospital
   12 January, 2006

258. Pediatric Imaging
   Course Moderator/Speaker
   College of Nursing, The Ohio State University College of Medicine
   Columbus, OH
   28 February, 2006

259. Pyloric Stenosis
   Course Moderator/Speaker
   Minnesota Society of Diagnostic Ultrasound 26th Annual Spring Seminar
   Brooklyn Park, MN
   26 March, 2006

260. Pediatric Sonography: Unique Challenges in the Hip and Spine
   Course Moderator/Speaker
   Minnesota Society of Diagnostic Ultrasound
   26th Annual Spring Seminar
   Brooklyn Park, MN
   26 March, 2006

261. Pediatric Abdominal Masses: Diagnosis & Treatment
   Visiting Professor
   Tripler Army Medical Center
   Educational Lecture Series
   Honolulu, HI
   12-18 March, 2006

262. Pediatric Radiology Case Conference
   Visiting Professor
   Tripler Army Medical Center
   Educational Lecture Series
   Honolulu, HI
   12-18 March, 2006
263. **Pediatric Chest Masses**  
Visiting Professor  
Tripler Army Medical Center  
Educational Lecture Series  
Honolulu, HI  
12-18 March, 2006

264. **Radiology Diagnosis & Treatment of Foreign Bodies**  
Visiting Professor  
Tripler Army Medical Center  
Educational Lecture Series  
Honolulu, HI  
12-18 March, 2006

265. **Pediatric Radiology Mock Boards**  
Visiting Professor  
Tripler Army Medical Center  
Educational Lecture Series  
Honolulu, HI  
12-18 March, 2006

266. **Pediatric Abdominal Emergency**  
Visiting Professor  
Tripler Army Medical Center  
Educational Lecture Series  
Honolulu, HI  
12-18 March, 2006

267. **Pediatric Head & Neck Masses: Radiological Diagnosis**  
Visiting Professor  
Tripler Army Medical Center  
Educational Lecture Series  
Honolulu, HI  
12-18 March, 2006

268. **Pediatric Head & Neck Masses: Interventional Radiological Management**  
Visiting Professor  
Tripler Army Medical Center  
Educational Lecture Series  
Honolulu, HI  
12-18 March, 2006

269. **Innovations and Techniques for Head and Neck Intervention**  
Course Moderator/Speaker  
AOCR Mid-Year Conference  
Dearborn, MI  
6-9 April, 2006

270. **Techniques of Head & Neck Invasive Sonography – “A Hands-on Workshop”**  
Course Moderator/Speaker  
AOCR Mid-Year Conference  
Dearborn, MI  
6-9 April, 2006
271. **Pediatric Head and Neck Masses: State of the Art in Diagnosis and Intervention**
   Visiting Professor
   Suny Downstate Medical Center
   Brooklyn, NY
   11 April, 2006

272. **Ultrasound-guided Interventional Procedures “Hands-On Workshop”**
   Course Moderator/Speaker
   MSUS-WFUMB (World Federation for Ultrasound in Medicine and Biology)
   Seoul, Korea
   28 May – 1 June 2006

   Course Faculty
   MSUS-WFUMB (World Federation for Ultrasound in Medicine and Biology)
   Seoul, Korea
   28 May – 1 June 2006

274. **Techniques of Musculoskeletal Invasive Sonography: “A Hands-on Course**
   Course Moderator/Speaker
   MSUS-WFUMB (World Federation for Ultrasound in Medicine and Biology)
   Seoul, Korea
   28 May – 1 June 2006

275. **Pediatric Radiology Seminar “for Medical Students”**
   Course Moderator/Speaker
   Ohio University College of Medicine
   Athens, OH
   22 June, 2006

276. **Pediatric Hip Disease: Radiologic Pathologic Correlation**
   Course Moderator/Speaker
   Genesis HealthCare System/Bethesda Hospital
   Zanesville, OH
   2 August, 2006

276. **Premium Compact Ultrasound (WFUMB-Biology-New Technology Seminar)**
   Course Moderator/Speaker
   Zonare Worldwide Sales Meeting
   Mountain View, CA
   23 August, 2006

277. **New Interventional Radiology Techniques in the Treatment of Cystic Lesions of the Pediatric Head and Neck**
   Course Moderator-Speaker
   Midwest Society for Pediatric Radiology Fall Conference
   Minneapolis, MN
   15-17 September, 2006

278. **New Interventional Radiology Techniques in the Treatment of Cystic Lesions of the Pediatric Head and Neck**
   Course Moderator-Speaker
   The Ohio State University College of Medicine
   Department of Radiology Noon Conference
   10 October, 2006
279. **Unique Aspects of Pediatric Trauma: Radiologic/Pathologic Correlation**  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   19 October, 2006

280. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   19 October, 2006

281. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   19 October, 2006

282. **Advanced Interventional Procedures**  
   Course Moderator-Speaker  
   BMUS (British Medical Ultrasound Society)  
   Manchester International Convention Centre, England  
   13 December, 2006

283. **Practical Concepts of Musculoskeletal Intervention in Children and Young Adults**  
   Course Moderator-Speaker  
   Practical Radiology at Whistler  
   Chateau Whistler Resort  
   Whistler, B.C., Canada  
   4-9 February, 2007

284. **Pediatric Imaging**  
   Course Moderator/Speaker  
   College of Nursing, The Ohio State University College of Medicine  
   Columbus, OH  
   6 March, 2007

285. **Ultrasound Guided Breast Intervention “Hands-on Workshop”**  
   Course Moderator/Speaker  
   AOCR Mid-Year Conference  
   Chicago, IL  
   24-25 March, 2007

286. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   15 February, 2007

287. **Pediatric Interventions: The Gamut**  
   Course Moderator-Speaker  
   32nd SIR Annual Scientific Meeting  
   Seattle, WA  
   3 March, 2007
288. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
7 March, 2007

289. **Advanced Techniques of Interventional Sonography**  
Course Moderator/Speaker  
1st Annual Ohio Medical Ultrasound Society Meeting  
Columbus, OH  
30 March, 2007

290. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
17 April, 2007

291. **Pediatric Interventional Radiology...of Gifts...and Cures**  
Invited Speaker  
Circle of Care: North America Leadership Conference  
Boston, MA  
2-4 May, 2007

292. **Radiologic Management of Soft Tissue Foreign Bodies-Case Studies**  
Visiting Professor  
University of Kentucky  
Lexington, KY  
10-11 May, 2007

293. **Pediatric Neck Masses: Radiologic Diagnosis and Intervention**  
Visiting Professor  
University of Kentucky  
Lexington, KY  
10-11 May, 2007

294. **Pediatric Liver Tumors: Radiologic Pathologic Correlation**  
Visiting Professor  
University of Kentucky  
Lexington, KY  
10-11 May, 2007

295. **Percutaneous Treatment of Head and Neck Cystic Masses**  
Course Moderator/Speaker  
NWORS/UTMC  
Toledo, OH  
16 May, 2007

296. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
2 August, 2007
297. **Interventional: Tutorials and Applications**  
   Course Moderator-Speaker  
   Musculoskeletal Ultrasound Society 17th Annual Conference  
   Paris, France  
   25-28 August, 2007

298. **Interventional: Hands-On**  
   Course Moderator-Speaker  
   Musculoskeletal Ultrasound Society 17th Annual Conference  
   Paris, France  
   25-28 August, 2007

299. **Head and Neck Cystic Masses: New Minimally and Micro-Invasive Treatment Solutions**  
   Course Moderator/Speaker  
   Genesis HealthCare System/Bethesda Hospital – Grand Rounds  
   Zanesville, OH  
   22 August, 2007

300. **Percutaneous Treatment of Lymphatic Malformations**  
   Course Moderator/Speaker  
   AAO-HNS Annual Meeting – Washington Convention Center  
   Washington, D.C.  
   17 September, 2007

301. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   20 September, 2007

302. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   20 September, 2007

   Course Moderator/Speaker  
   AOOCR 2007 Annual Convention “Imaging in Trauma & Critical Care”  
   Boca Raton, FL  
   24-28 September, 2007

304. **Imaging & Management of Non-accidental Trauma: Clinical & Legal Implications**  
   Course Moderator/Speaker  
   AOOCR 2007 Annual Convention “Imaging in Trauma & Critical Care”  
   Boca Raton, FL  
   24-28 September, 2007

305. **Radiological Management of Pediatric Emergencies II: Chest & Abdomen**  
   Course Moderator/Speaker  
   AOOCR 2007 Annual Convention “Imaging in Trauma & Critical Care”  
   Boca Raton, FL  
   24-28 September, 2007
306. **Pediatric Liver Tumors: Radiologic-Pathologic Correlation**  
Visiting Professor  
Boston Children's Hospital  
Boston, MA  
1-2 October, 2007

307. **Techniques of Pediatric Invasive Sonography: A “hands-on” Course**  
Course Moderator/Speaker  
Boston Children’s Hospital  
Boston, MA  
1-2 October, 2007

308. **Childhood Intussusception: Radiographic-Pathologic Correlation**  
Course Moderator/Speaker  
Boston Children’s Hospital  
Boston, MA  
1-2 October, 2007

309. **Techniques of Freehand Invasive Sonography with Thermal Ablation (Hands-on Workshop) (US)**  
Course Moderator/Speaker  
RSNA 2007  
Chicago, IL  
30 November, 2007

310. **Small Parts Interventional Ultrasound (Hands-on Workshop)**  
Course Moderator/Speaker  
RSNA 2007  
Chicago, IL  
30 November, 2007

311. **Radiology Unknown Case Discussions**  
Course Moderator-Speaker  
Practical Radiology at Whistler  
Chateau Whistler Resort  
Whistler, B.C., Canada  
3-8 February, 2008

312. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
21 February, 2008

313. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
21 February, 2008

314. **Pediatric Interventional Radiology: Changing lives with precision**  
Course Moderator-Speaker  
NEOUS (Northeast Ohio Ultrasound Society)  
Cleveland, OH  
23 February, 2008
315. **Pediatric Head and Neck Masses: State of the art in Diagnosis and Intervention**  
Course Moderator-Speaker  
NEOUS (Northeast Ohio Ultrasound Society)  
Cleveland, OH  
23 February, 2008

316. **Pediatric Hip/Spine Sonography**  
2008 Pediatric Ultrasound Conference Itinerary  
Course Moderator/Speaker  
Riley Hospital  
Indianapolis, IN  
8 March, 2008

317. **Diagnosis and Intervention of Cystic Neck Masses**  
2008 Pediatric Ultrasound Conference Itinerary  
Course Moderator/Speaker  
Riley Hospital  
Indianapolis, IN  
8 March, 2008

318. **Pyloric Stenosis**  
2008 Pediatric Ultrasound Conference Itinerary  
Course Moderator/Speaker  
Riley Hospital  
Indianapolis, IN  
8 March, 2008

319. **Techniques of Freehand Interventional Sonography – “A Hands-on Workshop”**  
Course Moderator/Speaker  
AOCR Mid Year Conference  
Chicago, IL  
12-13 April, 2008

320. **Advanced Techniques of Interventional Sonography**  
Course Moderator/Speaker  
2nd Annual Ohio Medical Ultrasound Society Meeting  
Columbus, OH  
18 April, 2008

321. **Pediatric Head & Neck Masses: Interventional Radiological Management**  
Atis K. Freimanis Radiology Visiting Professor Program  
Michigan State University  
22 April, 2008

322. **Advanced Techniques of Interventional Sonography**  
Course Moderator/Speaker  
The Ohio Society of Radiologic Technologists (OSRT)  
Worthington, OH  
27 April, 2008

323. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
14 May, 2008
<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Course Type</th>
<th>Location</th>
<th>Date</th>
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<tbody>
<tr>
<td>324</td>
<td>Pediatric Liver Tumors: Radiologic/Pathologic Correlation</td>
<td>Course Moderator-Speaker</td>
<td>Armed Forces Institute of Pathology (AFIP)</td>
<td>14 May, 2008</td>
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<tr>
<td>326</td>
<td>Interventional Radiology of the pediatric chest and abdomen</td>
<td>Visiting Professor</td>
<td>Children’s National Medical Center</td>
<td>24-25 June, 2008</td>
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<tr>
<td>327</td>
<td>Techniques of Invasive Sonography: A “hands-on” Course</td>
<td>Visiting Professor</td>
<td>Children’s National Medical Center</td>
<td>24-25 June, 2008</td>
</tr>
<tr>
<td>328</td>
<td>Pediatric Radiology Seminar “for Medical Students”</td>
<td>Course Moderator/Speaker</td>
<td>Ohio University College of Medicine</td>
<td>8 July, 2008</td>
</tr>
<tr>
<td>329</td>
<td>Pediatric Hip Sonography: Dynamic Pathology and Intervention</td>
<td>Course Moderator-Speaker</td>
<td>Armed Forces Institute of Pathology (AFIP)</td>
<td>7 August, 2008</td>
</tr>
<tr>
<td>330</td>
<td>Pediatric Liver Tumors: Radiologic/Pathologic Correlation</td>
<td>Course Moderator-Speaker</td>
<td>Armed Forces Institute of Pathology (AFIP)</td>
<td>7 August, 2008</td>
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<tr>
<td>331</td>
<td>Radiological Management of Common Pediatric Abdominal Emergencies</td>
<td>Course Moderator-Speaker</td>
<td>AOCR Resident Distance Learning Series</td>
<td>1 October, 2008</td>
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<tr>
<td>331</td>
<td>Practical Pediatric Musculoskeletal Intervention</td>
<td>Visiting Professor</td>
<td>Boston Children’s Hospital</td>
<td>6-7 October, 2008</td>
</tr>
</tbody>
</table>
332. **Techniques of Pediatric Invasive Sonography: A “Hands-on” Course**  
Course Moderator/Speaker  
Boston Children’s Hospital  
Boston, MA  
6-7 October, 2008

333. **Practical Pediatric Abdominal Intervention**  
Course Moderator/ Speaker  
Boston Children’s Hospital  
Boston, MA  
6-7 October, 2008

334. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
14 October, 2008

335. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
14 October, 2008

336. **Techniques of Freehand Invasive Sonography with Thermal Ablation (Hands-on Workshop) (US)**  
Course Moderator/ Speaker  
RSNA 2008  
Chicago, IL  
30 November, 2008

337. **Small Parts Interventional Ultrasound (Hands-on Workshop)**  
Course Moderator/ Speaker  
RSNA 2008  
Chicago, IL  
30 November, 2008

338. **Small Parts Interventional Ultrasound (Hands-on Workshop)**  
Course Moderator/ Speaker  
RSNA 2008  
Chicago, IL  
30 November, 2008

339. **Pediatric Peripherally Inserted Central Catheterization: How to Establish and Run the Service**  
Course Moderator/ Speaker  
RSNA 2008  
Chicago, IL  
30 November, 2008

340. **Radiology Unknown Case Discussions**  
Course Moderator-Speaker  
Practical Radiology at Whistler  
Chateau Whistler Resort  
Whistler, B.C., Canada  
8-13 February, 2009
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Course Type</th>
<th>Location</th>
<th>Date(s)</th>
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<tbody>
<tr>
<td>341</td>
<td>Pediatric Liver Tumors: Radiologic/Pathologic Correlation</td>
<td>Course</td>
<td>Armed Forces Institute of Pathology (AFIP)</td>
<td>24 February, 2009</td>
</tr>
<tr>
<td>342</td>
<td>Pediatric Hip Sonography: Dynamic Pathology and Intervention</td>
<td>Course</td>
<td>Armed Forces Institute of Pathology (AFIP)</td>
<td>24 February, 2009</td>
</tr>
<tr>
<td>343</td>
<td>Pediatric Series: A Practical Case-based Approach</td>
<td>Conference</td>
<td>SIR 34th Annual Scientific Meeting</td>
<td>7-12 March, 2009</td>
</tr>
<tr>
<td>344</td>
<td>Pediatric Series: Pediatric Vascular Procedures</td>
<td>Conference</td>
<td>SIR 34th Annual Scientific Meeting</td>
<td>7-12 March, 2009</td>
</tr>
<tr>
<td>345</td>
<td>Pediatric IR of the Abdomen</td>
<td>Visiting Professor</td>
<td>Children's Hospital of Philadelphia (CHOP)</td>
<td>2-3 April, 2009</td>
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<tr>
<td>346</td>
<td>Current Research Innovations in Pediatric Interventional Radiology</td>
<td>Visiting Professor</td>
<td>Children's Hospital of Philadelphia (CHOP)</td>
<td>2-3 April, 2009</td>
</tr>
<tr>
<td>347</td>
<td>Radiological Management of Soft Tissue Foreign Bodies head to toe</td>
<td>Visiting Professor</td>
<td>Children's Hospital of Philadelphia (CHOP)</td>
<td>2-3 April, 2009</td>
</tr>
<tr>
<td>348</td>
<td>Case Conference – Residents &amp; Fellows</td>
<td>Visiting Professor</td>
<td>CHOP</td>
<td>2-3 April, 2009</td>
</tr>
<tr>
<td>349</td>
<td>Pediatric Liver Tumors: Radiologic/Pathologic Correlation</td>
<td>Course</td>
<td>Armed Forces Institute of Pathology (AFIP)</td>
<td>7 April, 2009</td>
</tr>
</tbody>
</table>
350. Pediatric Hip Sonography: Dynamic Pathology and Intervention  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   7 April, 2009

351. Interventional Radiologic Management of Pediatric Head and Neck Masses  
   Visiting Professor  
   UCONN Health Center  
   Hartford, CT  
   8-9 April, 2009

352. Pediatric Hip and Spine  
   Course Moderator/Speaker  
   3rd Annual Ohio Medical Ultrasound Society Meeting  
   Columbus, OH  
   17 April, 2009

353. Pediatric Liver Tumors: Radiologic/Pathologic Correlation  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   30 April, 2009

354. Pediatric Hip Sonography: Dynamic Pathology and Intervention  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   30 April, 2009

355. Techniques of Invasive Sonography: A “Hands-on” Course"  
   Betty J. Wood Visiting Professor  
   BC Children’s Hospital  
   Vancouver, BC  
   5-8 May, 2009

356. Pediatric Head & Neck Masses: Interventional Radiological Management"  
   Betty J. Wood Visiting Professor  
   BC Children’s Hospital  
   Vancouver, BC  
   5-8 May, 2009

357. Pediatric Interventional Radiology  
   International Symposium on Pediatric Radiology  
   Rio De Janeiro – Brazil  
   23-25 July, 2009

358. Pediatric Liver Tumors: Radiologic/Pathologic Correlation  
   Course Moderator-Speaker  
   Armed Forces Institute of Pathology (AFIP)  
   Washington, DC  
   30 July, 2009
359. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
30 July, 2009

360. **Percutaneous Ablation of Aneurysmal Bone Cysts: Targeted Therapy and Initial Results**  
Course Moderator-Speaker  
OSOLS/MSTS Conference  
Boston, MA  
22-24 September, 2009

361. **Radiological Treatment of Cystic Masses in Children's and Young Adults**  
Visiting Professor-Speaker  
Universitario 12 de Octubre  
Madrid, Spain  
28 September, 2009

362. **Radiological Treatment of Cystic Masses in Children's and Young Adults**  
Course Moderator-Speaker  
Vall d’Hebrón Children’s Hospital  
Barcelona, Spain  
30 September, 2009

363. **Hip Interventional MUS “Interventional techniques guided by Ultrasound**  
Course Moderator-Speaker  
MUSOC  
Barcelona, Spain  
3 October, 2009

364. **Ultrasound Guided Procedures “Ultrasound Guided Procedures”**  
Course Moderator-Speaker  
MUSOC  
Barcelona, Spain  
3 October, 2009

365. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
17 October, 2009

366. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
17 October, 2009

367. **Sonographic Interventional Emergencies**  
Course Moderator/Speaker  
American Society of Radiologists (SRU)  
Chicago, IL  
1 November, 2009
368. **Techniques of Freehand Invasive US with Thermal Ablation (Hands-on Workshop)**
    Course Moderator-Speaker
    RSNA 95th Scientific Assembly & Annual Meeting
    Chicago, IL
    29 November, 2009

369. **Small Parts Interventional US (Hands-on Workshop)**
    Course Moderator-Speaker
    RSNA 95th Scientific Assembly & Annual Meeting
    Chicago, IL
    1 December, 2009 and 3 December, 2009

370. **Pediatric Chest Radiography for the Primary Care Physician**
    Course Moderator/Speaker
    Riverside Family Practice Center
    Columbus, OH
    16 December, 2009

371. **Fantastic New Interventions**
    Course Moderator-Speaker
    Practical Radiology at Whistler
    Chateau Whistler Resort
    Whistler, B.C., Canada
    1 January-5 February, 2010

372. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**
    Course Moderator-Speaker
    Armed Forces Institute of Pathology (AFIP)
    Washington, DC
    18 February, 2010

373. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**
    Course Moderator-Speaker
    Armed Forces Institute of Pathology (AFIP)
    Washington, DC
    18 February, 2010

374. **Techniques of Freehand Interventional Breast Sonography: “A Hands-on Workshop”**
    Course Moderator/Speaker
    AOCR Mid-Year Conference
    Dallas, TX
    20-21 March, 2010

375. **Ultrasound Guided Breast Intervention – “A Hands-on Workshop”**
    Course Moderator/Speaker
    AOCR Mid-Year Conference
    Dallas, TX
    20-21 March, 2010

376. **Sonographic Care In Pyloric Stenosis**
    Course Moderator/Speaker
    MSDU 30th Annual Spring Seminar
    Brooklyn Park, MN
    26-28 March, 2010
377. Emergency Interventional Sonographic Procedures
Course Moderator/Speaker
MSDU 30th Annual Spring Seminar
Brooklyn Park, MN
26-28 March, 2010

378. Challenges and Opportunities for Healthcare in the Future
Invited Speaker
Alpha Epsilon Delta Initiation
Ohio Gamma Chapter
Otterbein College
16 May, 2010

379. Pediatric Liver Tumors: Radiologic/Pathologic Correlation
Course Moderator-Speaker
Armed Forces Institute of Pathology (AFIP)
Washington, DC
20 May, 2010

380. Pediatric Hip Sonography: Dynamic Pathology and Intervention
Course Moderator-Speaker
Armed Forces Institute of Pathology (AFIP)
Washington, DC
20 May, 2010

381. New Roles for Interventional Radiology
Grand Rounds
Eye & Pediatric Otolaryngology Grand Rounds for Community Physicians
OSU Eye and Ear Institute at The Ohio State College of Medicine
Columbus, OH
22 May, 2010

382. Salivary Gland Ablation
Invited Speaker
Aicardi Syndrome Family Conference
Bloomingdale, IL
10 July, 2010

382. Hip Interventional MUS “Interventional techniques guided by Ultrasound
Course Moderator-Speaker
MUSOC
Cancun, Mexico
21-24 July, 2010

383. Pediatric Liver Tumors: Radiologic/Pathologic Correlation
Course Moderator-Speaker
Armed Forces Institute of Pathology (AFIP)
Washington, DC
29 July, 2010

384. Pediatric Hip Sonography: Dynamic Pathology and Intervention
Course Moderator-Speaker
Armed Forces Institute of Pathology (AFIP)
Washington, DC
29 July, 2010
385. **Pediatric Radiology Case Review**  
Course Moderator-Speaker  
Family Practice Residency Program  
Doctor's West  
Columbus, OH  
15 September, 2010

386. **Diagnostic & Therapeutic Pediatric MSK Interventions**  
Course Moderator-Speaker  
Boston Children's Hospital  
Boston, MA  
20-21 September, 2010

387. **Techniques of Pediatric Invasive Sonography: A “Hands-on” Course**  
Course Moderator-Speaker  
Boston Children’s Hospital  
Boston, MA  
20-21 September, 2010

388. **Pediatric Head and Neck Masses: State of the Art Diagnosis and Intervention**  
Visiting Professor  
Daughters Medical Center  
Ashland, Ky  
24 September, 2010

389. **Radiologic Placement and Management of Cecostomy Catheters**  
CIRSE  
Course Moderator-Speaker  
Valencia, Spain  
2-6 October, 2010

390. **New Care Solutions for Treatment of Lymphatic Malformations**  
CIRSE  
Course Moderator-Speaker  
Valencia, Spain  
2-6 October, 2010

391. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
14 October, 2010

392. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AFIP)  
Washington, DC  
14 October, 2010

393. **Sonography of the Pediatric Hip and Spine**  
Course Moderator-Speaker  
SDMS Annual Conference  
Hyatt Regency Denver/Colorado Convention Center  
Denver, CO  
14-17 October, 2010
394. **Advances in Pediatric Therapeutic Interventional Sonography**  
Course Moderator-Speaker  
SDMS Annual Conference  
Hyatt Regency Denver/Colorado Convention Center  
Denver, CO  
14-17 October, 2010

395. **Advances in Radiological Treatment of Head & Neck Masses**  
Visiting Professor  
Michigan State University  
Grand Rapids, MI  
5 November, 2010

396. **Techniques for Interventional Sonography and Thermal Ablation (Hands-on Workshop)**  
Course Moderator-Speaker  
RSNA 95th Scientific Assembly & Annual Meeting  
Chicago, IL  
28 November, 2010

397. **Small Parts Interventional Ultrasound (Hands-on Workshop)**  
Course Moderator-Speaker  
RSNA 95th Scientific Assembly & Annual Meeting  
Chicago, IL  
30 November, 2010 & 2 December, 2010

398. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AIRP)  
Washington, DC  
10 February, 2011

399. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AIRP)  
Washington, DC  
10 February, 2011

400. **Pediatric Interventional Radiology: Changing lives with precision**  
Course Moderator-Speaker  
NEOUS (Northeast Ohio Ultrasound Society)  
Cleveland, OH  
19 February, 2011

401. **Advances in Radiological Treatment of Head & Neck Masses**  
Course Moderator-Speaker  
NEOUS (Northeast Ohio Ultrasound Society)  
Cleveland, OH  
19 February, 2011

402. **Chest, GI, GU, & Neuro**  
Course Moderator-Speaker  
OSU College of Nursing  
Columbus, OH  
22 February, 2011
403. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AIRP)  
Washington, DC  
17 March, 2011

404. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AIRP)  
Washington, DC  
17 March, 2011

405. **Advanced Techniques of Interventional Ultrasound**  
Course Moderator/Speaker  
5th Annual Ohio Medical Ultrasound Society Meeting  
Columbus, OH  
8 April, 2011

406. **Percutaneous Biopsy and Treatment of Aneurysmal Bone Cysts**  
Course Moderator/Speaker  
AOCR Annual Conference  
Palm Beach, FL  
11-15 April, 2011

407. **Interventional Radiology Treatment of Benign Head and Neck Masses**  
Course Moderator/Speaker  
AOCR Annual Conference  
Palm Beach, FL  
11-15 April, 2011

408. **Interventional Radiology**  
Course Moderator/Speaker  
2011 Annual Pediatric Infectious Disease Nurses Conference  
Columbus, OH  
15 April, 2011

409. **General Techniques and Foreign Body Removal**  
Course Moderator/Speaker  
AIUM Annual Convention  
New York, New York  
17 April, 2011

409. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AIRP)  
Washington, DC  
5 May, 2011

410. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**  
Course Moderator-Speaker  
Armed Forces Institute of Pathology (AIRP)  
Washington, DC  
5 May, 2011
411. **Pediatric Radiology in Acute Abdominal Emergencies**
Course Moderator-Speaker
Pediatric Spring Symposium:
Sowing the Seeds of Scholarship
St. Rita's Medical Center Auxiliary Conference Center
Lima, OH
7 May, 2011

412. **Pediatric Liver Tumors: Radiologic/Pathologic Correlation**
Course Moderator-Speaker
Armed Forces Institute of Pathology (AIRP)
Washington, DC
28 July, 2011

413. **Pediatric Hip Sonography: Dynamic Pathology and Intervention**
Course Moderator-Speaker
Armed Forces Institute of Pathology (AIRP)
Washington, DC
28 July, 2011

414. **Interventional Radiology-Respiratory Therapy Coorelations-Pioneering Techniques in OH**
Course Moderator-Speaker
Ohio Society for Respiratory Care – 33rd Annual State Meeting
Columbus, OH
16 August, 2011

415. **Musculoskeletal Interventional Techniques Guided by Ultrasound**
Course Moderator-Speaker
MUSoc 2011
Rio de Janeiro, Brazil
4-7 September, 2011

416. **Ultrasound Guided Management of Embedded Foreign Bodies**
Course Moderator-Speaker
MUSoc 2011
Rio de Janeiro, Brazil
4-7 September, 2011

415. **Pediatric Musculoskeletal Invasive Sonography: New Opportunities for Care**
Course Moderator-Speaker
Central Ohio Ultrasound Society Meeting
Newark, OH
10 September, 2011

**INVENTIONS/PATENTS:**

*Shiels Intussusception Air Reduction System*
1988
U.S. Patent Number 5,061,239

*Cincinnati Standoff*
Acoustic Standoff Pad
1989
Cincinnati, OH
NEW TECHNIQUES:

Sonographically Guided Foreign Body Removal
1989
Cincinnati, OH

Valsalva-Assisted Air Intussusception Reduction
1989
Cincinnati, OH

PUBLICATIONS:


13. Shiels WE II: Childhood Intussusception: Techniques of Diagnosis and Therapy: RSNA Video Today Journal of Imaging Science 1993: Vol 7; No 4


40. Shiels WE II: The confidence to manage. Interview by Lynne Pearce. Nurs Stand. 2004 May 26-June 1;18(37):14-5


**BOOK CHAPTERS**

1. Shiels II WE. Pediatric Liver Tumors: Radiologic/Pathologic Correlation - Radiologic Pathology 1st Edition 2002; 1013


PRESENTATIONS:

**Ovarian Dermoid Cyst Complicated by an Entero-ovarian Fistula**
OB-GYN Armed Forces Seminar, New Orleans, LA, October, 1985

**Chronic Torsion of the Wandering Spleen**
Pediatric Radiology Symposium, Cincinnati, OH, January 24-25, 1987

**A Simple Device for Air Reduction of Intussusception**
The Society for Pediatric Radiology, San Antonio, TX, April 5-9, 1989

**Sonographic Localization and Guided Removal of Soft Tissue Foreign Bodies**
The Society for Pediatric Radiology, San Antonio, TX, April 5-9, 1989

**Sonographic Localization and Guided Removal of Soft Tissue Foreign Bodies**
The Benjamin Felson Annual Lecture Series, University of Cincinnati College of Medicine, Cincinnati, OH, April 15-16, 1989

**A Simple Device for Air Reduction of Intussusception**
Ohio State Radiological Society, Cincinnati, OH, April 28-30, 1989

**Practical Models for Invasive and Non-invasive Sonography Training**
Radiological Society of North America, Chicago, IL, November 26 - December 1, 1989

**Hepatic Veno-occlusive Disease: Sonographic Findings with Pathologic Correlation**
The Society for Pediatric Radiology, Cincinnati, OH, April 19-22, 1990

**Juvenile Colonic Perforation: Histologic Correlates**
The Association of University Radiologists, Orlando FL, March 17-21, 1991

**Juvenile Colonic Perforation: Experimental Results and Clinical Applications**

**Abdominal Radiographic Evaluations of Childhood Intussusception**
The Society for Gastrointestinal Radiology, Orlando, FL, February 16-21, 1992

**Valsalva Maneuver During Air Reduction of Intussusception**
The Society for Pediatric Radiology, Orlando, FL, May 14-17, 1992

**The Shiels Device: An Experience in Technology Development**
Pediatric Imaging Research Conference, Phoenix, AZ January 13-15, 1995

**Childhood Intussusception: Focused Improvements with Better Clinical Outcomes**
The Society For Pediatric Radiology, Washington, DC, April 26-30, 1995

**Handling of the Acutely Ill or Injured Child**
American Roentgen Ray Society, Washington, DC, April 30- May 5, 1995

**Interventional Breast Ultrasound Learning System**

**Juvenile Colonic Perforation in the Porcine Model: Relative Risk in the Neonate.**
International Pediatric Radiology ’96 26-30 May, 1996
Outpatient Management of Childhood Intussusception: Initial Results and Strategic Partnerships
The Society for Pediatric Radiology, St. Louis, MO, 15-18 May, 1997

Invasive Sonography: Principles, Applications, and Learning Systems
European Society of Pediatric Radiology, Post-graduate Course, Rhodes, Greece 18-19 May, 1998

Soft Tissua Foreign Bodies: Diagnostic and Therapeutic Radiological Management
European Society of Pediatric Radiology, Post-graduate Course, Rhodes, Greece 18-19 May, 1998

Emergency Interventional Radiology in the Pediatric Chest and Abdomen
European Society of Pediatric Radiology, Post-Graduate Course, Rhodes, Greece 18-19 May, 1998

Dynamic Sonographic Examination of the Congenital Clubfoot
American Institute of Ultrasound in Medicine, 44th Annual Convention, San Francisco, CA 2-5 April, 2000

Soft-Tissue Foreign Bodies: Sonographic diagnosis and guided-intervention
American Institute of Ultrasound in Medicine, 44th Annual Convention, San Francisco, CA 2-5 April, 2000

Advances in Pediatric Airway Radiology
Wiet GJ, Shiels WE II, Long FR, Rudman DT
American Society of Pediatric Otolaryngology Annual Meeting, Orlando, FL, May, 2000

Soft-Tissue Foreign Bodies: Sonographic diagnosis and guided-intervention
Society for Pediatric Radiology 43rd Annual Meeting, Naples, FL 29 April – 3 May, 2000

Dynamic Sonographic Examination of the Congenital Clubfoot
Society for Pediatric Radiology 43rd Annual Meeting, Naples, FL 29 April – 3 May, 2000

Radiology: A Case-based Assessment
OMEN/OMEN-TV, The Ohio State University Medical Center, Columbus, OH February 13-15, 2001

Radiology: Interventional Radiology Updates
OMEN/OMEN-TV, The Ohio State University Medical Center, Columbus, OH January 29-February 1, 2002

Focused Sclerotherapy of Macrocystic Lymphatic Malformations

Ultrasound Guided Aspiration in the Management of Patients with Cerebrospinal Fluid Pseudocysts

Current Practices in Diagnostic Pediatric Radiology
Iraqi Medical Specialty Forum, Baghdad, Iraq 12-19 February, 2004

Current Practices in Pediatric Interventional Radiology
Iraqi Medical Specialty Forum, Baghdad, Iraq 12-19 February, 2004

Current Practices in Pediatric Emergency Radiology
Iraqi Medical Specialty Forum, Baghdad, Iraq 12-19 February, 2004

A Novel Method of Widespread Metastatic Rhabdomyosarcoma Induction in a Small Animal Model
Society for Pediatric Radiology 2004 Annual Meeting, Savannah, GA April 28-May 1, 2004

Coaxial Catheter System for Contained Sclerotherapy of Small Cystic Masses in Children
Society for Pediatric Radiology 2004 Annual Meeting, Savannah, GA April 28-May 1, 2004
Plunging Ranula: Successful Treatment with Percutaneous Sclerotherapy and Regional Ethanol Ablation  
Society for Pediatric Radiology 2004 Annual Meeting, Savannah, GA April 28-May 1, 2004

“Semi-upright US-guided lumbar puncture in infants”  
Society for Pediatric Radiology 2004 Annual Meeting, Savannah, GA April 28-May 1, 2004

Site-Specific Induction of Lymphatic Malformations in a Rat Model for Imaging  
Society for Pediatric Radiology 2004 Annual Meeting, Savannah, GA April 28-May 1, 2004

Coaxial Catheter System for Contained Sclerotherapy of Small Cystic Masses in Children  
American Institute of Ultrasound in Medicine 2004 Annual Meeting, Phoenix, AZ June 20-22, 2004

Healing Wounds on the Tigris: Efforts of Reconstruction of Medicine in Iraq  
American College of Radiology 2005 Annual Meeting, Washington, D. C. April 9-14, 2005

Percutaneous Treatment of Intraorbital Cystic Masses in Children  
European Society of Pediatric Radiology, Post-Graduate Course, Dublin, Ireland 28 May- 4 June, 2005

Successful Percutaneous Emulsification, Drainage and Ablation of Head & Neck Dermoid Cysts  
European Society of Pediatric Radiology, Post-Graduate Course, Dublin, Ireland 28 May- 4 June, 2005

Sonography of Soft Tissue Foreign Bodies: Diagnostic and Operative Coorelation of the Hypoechoic Halo  
European Society of Pediatric Radiology, Post-Graduate Course, Dublin, Ireland 28 May- 4 June, 2005

Soft Tissue Foreign Body Removal: Correlation of Blunt vs Sharp Dissaction Requirements for Removal  
European Society of Pediatric Radiology, Post-Graduate Course, Dublin, Ireland 28 May- 4 June, 2005

Percutaneous Interventional Sonography of the Orbit  
MSUS-WFUMB (World Federation for Ultrasound in Medicine and Biology), Seoul, Korea 28 May – 1 June 2006

Head & Neck Masses: “Extra Cranial”  
The Ohio State University College of Medicine, Plastic Surgery Lecture, Columbus, OH 21 November, 2005

Musculoskeletal Interventional Radiology “Techniques & Applications”  

Hands-on Workshop: Interventional Musculoskeletal Ultrasound  

Percutaneous Therapy for Head and Neck Cystic Masses  
WFUMB (World Federation for Ultrasound in Medicine and Biology), Seoul, Korea, 28 May – 1 June 2006

Percutaneous Interventional Sonography of the Orbit  
WFUMB (World Federation for Ultrasound in Medicine and Biology), Seoul, Korea, 28 May – 1 June 2006

Percutaneous Therapy for Head and Neck Cystic Masses  
WFUMB (World Federation for Ultrasound in Medicine and Biology), Seoul, Korea, 28 May – 1 June 2006

Percutaneous Treatment of Cystic Masses of the Head and Neck  
Society for Pediatric Radiology 2007 Annual Meeting, Miami, FL April 18-21, 2007
“Destressing” the Workplace
Society for Pediatric Radiology 2007 Annual Meeting, Miami, FL April 18-21, 2007

Definitive Percutaneous Treatment of Lymphatic Malformations of the Trunk and Extremities

Pediatric IR Radiology: Changing Lives with Precision and Innovation
Dublin Rotary, Dublin, OH 6 June, 2008

Self Mutilation in Children
RSNA 2008, Chicago, IL, 30 November-5 December, 2008

Pediatric IR Radiology: Changing Lives with Precision and Innovation
with Dr. Villanueva, Dublin Rotary, Dublin, OH, 20 February, 2009

Dynamic Sonography of Aneurysmal Bone Cysts
Society for Pediatric Radiology 2009 Annual Meeting, San Diego, CA 21-25 April, 2009

Pediatric IR Radiology: Changing Lives with Precision and Innovation
District Rotary Meeting, Lancaster, OH 15 May, 2009

Targeted Image-guided Percutaneous Biopsy of Aneurysmal Bone Cysts
RSNA 95th Scientific Assembly & Annual Meeting, Chicago, IL 3 December, 2009

Pediatric Head & Neck Masses: Interventional Radiological Management
EENT Society Dinner Meeting, Columbus, OH 2 February, 2010

Innovative Approach to Treat Lymphatic Malformations
Pediatric Series: A Practical Case-based Approach
SIR 35th Annual Scientific Meeting, Tampa, FL, 13-18 March, 2010

Pediatric Interventional Radiology Practice: How To Successfully Negotiate for Equipment
SPR Annual Meeting, Boston, MA, 14-17 April, 2010

Pediatric IR Radiology: Changing Lives with Precision and Innovation
District Rotary Meeting, Athens, OH May 15, 2010

Percutaneous Image-guided Soft Tissue Foreign Body Removal: A 15 Year Experience
RSNA 96th Scientific Assembly & Annual Meeting, Chicago, IL 1st December, 2010

Definitive Percutaneous Treatment of Simple and Plunging Ranula
RSNA 96th Scientific Assembly & Annual Meeting, Chicago, IL 1st December, 2010

Percutaneous Treatment of Microcystic Lymphatic Malformation
RSNA 96th Scientific Assembly & Annual Meeting, Chicago, IL 1st December, 2010

New Roles for Interventional Radiology in Oral and Dental Pathology
The Columbus Dental Society Meeting, Columbus, OH 25 January, 2011

Interventional Radiology of the Head, Neck, and Orbit
EENT Society Dinner Meeting, Columbus, OH 7 February, 2011

Bleomycin Protein Microfoam: Stability and Clinical Applications
SIR 36th Annual Scientific Meeting, Chicago, IL, 26-31 March, 2011
Gelatin Foam Embolization of Large Gauge Needle Osteotomies During Ablation of Aneurysmal Bone Cysts
SIR 36th Annual Scientific Meeting, Chicago, IL, 26-31 March, 2011

Joint Injection Under US Guidance Workshop

Joint Injection Under US Guidance Workshop

Direct Tumoral Therapy of Aneurysmal Bone Cysts in Children’s

Pediatric IR Radiology: Changing Lives with Precision and Innovation
Dublin Rotary Meeting, Dublin, OH October 29, 2010

Pediatric IR Radiology: Changing Lives with Precision and Innovation
Presentation with Dr. Rathod
Hilliard Rotary Meeting, Hilliard, OH January 27, 2011

Pediatric IR Radiology: Changing Lives with Precision and Innovation
Olentangy Rotary Meeting, Powell, OH September 15, 2011

EXHIBITS AND POSTERS:

Practical Models for Invasive Sonography
Radiological Society of North America, Chicago, IL December 1-6, 1991

Air Enema for Childhood Intussusception
Radiological Society of North America, Chicago, IL 1-6 December, 1991

A Model for Interventional Breast Ultrasound
Radiological Society of North America, Chicago, IL 1-6 December, 1991

Interventional Breast Ultrasound: Clinical Application
Radiological Society of North America, Chicago, IL 28 November-4 December, 1992

A Model for Interventional Breast Ultrasound
Association of University Radiologists, Cincinnati, OH 19-22 May, 1993

Phantom of the Breast: A Model for Invasive Breast Sonography
American Institute of Ultrasound in Medicine, San Francisco, CA 26-29 March, 1995

Phantom of the Breast: A Model for Invasive Breast Sonography
American Roentgen Ray Society, Washington, DC 30 April - 5 May, 1995
**Phantom of the Breast: A Model for Invasive Breast Sonography**
Radiological Society of North America, Chicago, IL
26 November - 1 December, 1995

**Diagnostic and Interventional Ultrasound of the Pediatric Spine**
Coley BD, Koch BL, Shiels WE II, Bates DG, Hogan MJ, Murakami JW
American Institute of Ultrasound in Medicine, San Francisco, CA
2-5 April, 2000

**Successful Percutaneous Treatment of Simple and Plunging Ranulas**
Shiels WE2, Wiet RM1, Wiet GJ3, Tobin EJ1, Kang DR3
American Society for Pediatric Otolaryngology, Las Vegas, NV
5 June, 2005

**Self-Embedding Behavior: The Problem, the Challenge, and the Future**
Emily Lorenz, B.A., Jarrod Leffler Ph.D., Nicholas Lofthouse Ph.D., John Campo MD, William E. Shiels II, DO
American Psychological Association, Toronto, Ont., Canada
6-9 August, 2009

**EDUCATIONAL VIDEOTAPES/CD-ROM:**

Shiels WE II, Kirks DR:
The Air Enema for Diagnosis and Therapy of Intussusception.
Children's Hospital Medical Center, Cincinnati, OH - July 1990

Shiels WE II, Babcock DS:
Practical Models for Invasive Sonography Training.
Children's Hospital Medical Center, Cincinnati, OH - July 1990

Shiels WE II, Babcock DS:
Sonographically Guided Foreign Body Localization and Removal: A Training Model.
Children's Hospital Medical Center, Cincinnati, OH - July 1990

Georgian-Smith D, Shiels WE II:
A Model for Interventional Breast Ultrasound
University of Cincinnati College of Medicine, Cincinnati, OH- December 1991

Shiels WE II:
Intussusception
RSNA Today Video, Vol 7

Radiological Society of North America
Oak Brook, Illinois, December 1993

Georgian-Smith D, Shiels WE II:
Phantom of the Breast: A Model for Invasive Breast Sonography
Cincinnati, OH December 1994

Shiels WE II
Handling of The Acutely Ill and Injured Child
American Roentgen Ray Society, Pediatric Emergency Radiology Categorical Course CD-ROM
Washington, DC, April 1995
RESEARCH GRANTS:


Shiels WE. Clinical Utility and Pitfalls of Ultrasound Guided Foreign Body Removal in War Fighters Funded through the DoD/U.S. Army Medical Research and Material Command September 2008

EDUCATIONAL GRANTS:


WORKS IN PROGRESS:

O'Connor SC, Shiels WE, Shanley DS. Juvenile colonic perforation in the porcine model: Relative risk in the neonate

(revised 09/15/11)
### Foreign Body Removal Record Form

**Surgical procedure**

**Removal technique:** ( ) **Surgical** - traditional surgical removal following skin marking of foreign body location

<table>
<thead>
<tr>
<th>Cadaver thigh:</th>
<th>FB location</th>
<th>FB location</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) #1</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
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<tr>
<td>( ) #2</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
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<tr>
<td>( ) #3</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
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</tr>
</tbody>
</table>

**Surgical procedure**

**Removal technique:** ( ) **Wire localization** – surgical removal of the foreign bodies following ultrasound guided placement of localization wires at the site of each foreign body.

<table>
<thead>
<tr>
<th>Cadaver thigh:</th>
<th>FB location</th>
<th>FB location</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) #4</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
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<tr>
<td>( ) #5</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
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<tr>
<td>( ) #6</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
<td></td>
</tr>
</tbody>
</table>

**Radiological procedure**

**Removal technique:** ( ) **Percutaneous** - Interventional radiological ultrasound guided foreign body removal

<table>
<thead>
<tr>
<th>Cadaver thigh:</th>
<th>FB location</th>
<th>FB location</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) #7</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
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<tr>
<td>( ) #8</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
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<tr>
<td>( ) #9</td>
<td>( ) #1 ( ) #2 ( ) #3</td>
<td></td>
</tr>
</tbody>
</table>

FB type: wood

Incision size (self report): __________________________________________

Incision size (video confirmation): ________________________________________

Time of procedure (self report): __________________________________________

Time of procedure (video confirmation): ___________________________________

Wound closure/number of sutures (self report): __________________________________________

Wound closure/number of sutures (video confirmation): ____________________________

Overall removal success: (self report): __________________________________________

Overall removal success: (video confirmation): _________________________________

Procedural differences as noted by study coordinator from documentation during procedure and review of video documentation: Notes: (see back of page)
<table>
<thead>
<tr>
<th>Surgical Procedure - traditional surgical removal following skin marking of foreign body location</th>
<th>Thigh #</th>
<th>Cadaver Specimen Information</th>
<th>Surgical Procedure - traditional surgical removal following skin marking of foreign body location</th>
<th>Incision size in cm</th>
<th>Overall removal success</th>
<th>Future style</th>
<th>Time determined that FB could not be located</th>
<th>(Self report &amp; study coordinator observe) Time of procedure to remove FB</th>
<th>FB who closure or stopped looking for FB</th>
<th>(Self report &amp; study coordinator observe) Time of procedure to remove FB (w/ sutures) skin to skin time</th>
<th># of sutures</th>
<th>Surgical Procedure - traditional surgical removal following skin marking of foreign body location</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>#5862 Female, 87 years old Cause of death: Alzheimer's</td>
<td>1</td>
<td>44</td>
<td>No</td>
<td>11</td>
<td>11</td>
<td>15</td>
<td>8</td>
<td>continuous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>#5862 Female, 87 years old Cause of death: Alzheimer's</td>
<td>1</td>
<td>41</td>
<td>No</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>continuous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>#5862 Female, 87 years old Cause of death: Alzheimer's</td>
<td>1</td>
<td>58</td>
<td>Yes</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>continuous</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Surgical Procedure</td>
<td>Thigh #</td>
<td>Cadaver Specimen Information</td>
<td>Size of wooden FB (part of a toothpick) to be removed in cm</td>
<td>Incision size in mm</td>
<td>Overall removal success</td>
<td>Time determined that FB could not be located</td>
<td>(Self report &amp; study coordinator observe) Time of procedure to remove FB</td>
<td>(Self report &amp; study coordinator observe) Time of procedure to remove FB w/o closure or stopped looking for FB</td>
<td>FB</td>
<td># of sutures</td>
<td>Skill</td>
<td>Suture style</td>
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<tr>
<td>Traditional surgical removal following skin marking of foreign body location</td>
<td>S4</td>
<td>1</td>
<td>54</td>
<td>Yes</td>
<td>5</td>
<td>10</td>
<td>Yes</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>interrupted</td>
</tr>
<tr>
<td>Surgical Procedure</td>
<td>S5</td>
<td>1</td>
<td>43</td>
<td>Yes</td>
<td>2</td>
<td>4</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>interrupted</td>
</tr>
<tr>
<td>Surgical Procedure</td>
<td>S6</td>
<td>1</td>
<td>30</td>
<td>Yes</td>
<td>2</td>
<td>5</td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>interrupted</td>
</tr>
<tr>
<td>Thigh #</td>
<td>Cadaver Specimen Information</td>
<td>Surgical Procedure - traditional surgical removal following <strong>skin marking</strong> of foreign body location</td>
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<tr>
<td>S7</td>
<td>139 Yes 2 7 5 interrupte...</td>
<td>Surgical Procedure - traditional surgical removal following <strong>skin marking</strong> of foreign body location</td>
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<tr>
<td>S8</td>
<td>1 58 Yes 5 11 6 interrupte...</td>
<td>Surgical Procedure - traditional surgical removal following <strong>skin marking</strong> of foreign body location</td>
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<tr>
<td>S9</td>
<td>1 45 Yes 4 8 5 interrupte...</td>
<td>Surgical Procedure - traditional surgical removal following <strong>skin marking</strong> of foreign body location</td>
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<tr>
<td>Surgical Procedure - Wire localization</td>
<td>Thigh #</td>
<td>Cadaver Specimen Information</td>
<td>Size of wooden FB (part of a toothpick) to be removed in cm</td>
<td>Time determined that FB could not be located</td>
<td>Overall removal success</td>
<td>Time of procedure to remove FB (Self report &amp; study coordinator observe)</td>
<td>Time of procedure to remove FB w/o closure or stopped looking for FB (Self report &amp; study coordinator observe)</td>
<td>Time of procedure to remodel FB (w/ sutures) skin to skin</td>
<td># of sutures</td>
<td>Suture style</td>
<td>Cause of death</td>
<td>Time of procedure to remodel FB (w/ sutures) skin to skin</td>
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<tr>
<td>W1</td>
<td></td>
<td>#5849 right leg Male</td>
<td>1</td>
<td>30</td>
<td>Yes</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>interrupted</td>
<td>Dementia &amp; Heart Disease</td>
<td>1</td>
<td>3</td>
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<tr>
<td>W2</td>
<td></td>
<td>#5849 right leg Male</td>
<td>1</td>
<td>25</td>
<td>Yes</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>interrupted</td>
<td>Dementia &amp; Heart Disease</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>W3</td>
<td></td>
<td>#5849 right leg Male</td>
<td>1</td>
<td>24</td>
<td>Yes</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>interrupted</td>
<td>Dementia &amp; Heart Disease</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Surgical Procedure - Wire localization</td>
<td>Cadaver Specimen Information</td>
<td>Size of wooden FB (part of a toothpick) to be removed in cm</td>
<td>Incision size in mm</td>
<td>Overall removal success</td>
<td>Time determined that FB could not be located</td>
<td>(Self report &amp; study coordinator observe) Time of procedure to remove FB w/o closure or stopped looking for FB</td>
<td>(Self report &amp; study coordinator observe) Time of procedure to remove FB (w/ sutures) skin to skin time</td>
<td># of sutures</td>
<td>Suture style</td>
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<tr>
<td>W4</td>
<td>#5849 left leg Male 91 years old Cause of death: Dementia &amp; Heart Disease</td>
<td>1 30 Yes</td>
<td>4</td>
<td>7</td>
<td>5 interrupted</td>
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<td>W5</td>
<td>#5849 left leg Male 91 years old Cause of death: Dementia &amp; Heart Disease</td>
<td>1 39 No</td>
<td>8</td>
<td>8</td>
<td>12 6 interrupted</td>
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<td>W6</td>
<td>#5849 left leg Male 91 years old Cause of death: Dementia &amp; Heart Disease</td>
<td>1 30 Yes</td>
<td>6</td>
<td>10</td>
<td>4 interrupted</td>
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<tr>
<td>Surgical Procedure - Wire localization</td>
<td>#5348</td>
<td>Male</td>
<td>81 years old</td>
<td>Cause of death: Liver Disease</td>
<td>W7</td>
<td>1</td>
<td>36</td>
<td>Yes</td>
<td>2</td>
<td>5</td>
<td>5</td>
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<td>Surgical Procedure - Wire localization</td>
<td>#5348</td>
<td>Male</td>
<td>81 years old</td>
<td>Cause of death: Liver Disease</td>
<td>W8</td>
<td>1</td>
<td>37</td>
<td>Yes</td>
<td>1</td>
<td>6</td>
<td>6</td>
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</tr>
<tr>
<td>Surgical Procedure - Wire localization</td>
<td>#5348</td>
<td>Male</td>
<td>81 years old</td>
<td>Cause of death: Liver Disease</td>
<td>W9</td>
<td>1</td>
<td>38</td>
<td>Yes</td>
<td>2</td>
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<td>6</td>
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<td>#5862 Female Right leg 87 years old Cause of death: Alzheimer's</td>
<td>1</td>
<td>5</td>
<td>Yes</td>
<td>10</td>
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<td>#5862 Female Right leg 87 years old Cause of death: Alzheimer's</td>
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<td>6</td>
<td>Yes</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>N/A</td>
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<td>#5862 Female Right leg 87 years old Cause of death: Alzheimer's</td>
<td>1</td>
<td>6</td>
<td>Yes</td>
<td>4</td>
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<td>Cadaver Specimen Information</td>
<td>Time determined that FB could not be located</td>
<td>Overall removal success</td>
<td>Time of procedure to remove FB w/o closure or stopping looking for FB</td>
<td>Time of procedure to remove FB (w/ sutures) skin to skin</td>
<td># of sutures</td>
<td>Suture style</td>
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<tr>
<td>Radiological Procedure</td>
<td>Removal Technique - Percutaneous - interventional radiological ultrasound guided foreign body removal</td>
<td>#5861 Female Right leg 68 years old Cause of death: Huntington's Chorea</td>
<td>1 5 Yes</td>
<td>23</td>
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<td>Radiological Procedure</td>
<td>Removal Technique - Percutaneous - interventional radiological ultrasound guided foreign body removal</td>
<td>#5861 Female Right leg 68 years old Cause of death: Huntington's Chorea</td>
<td>1 5 Yes</td>
<td>26</td>
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<td>#5861 Female Right leg 68 years old Cause of death: Huntington's Chorea</td>
<td>1 9 Yes</td>
<td>17</td>
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<td>0 N/A</td>
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<td>Removal Technique - Percutaneous - interventional radiological ultrasound guided foreign body removal</td>
<td>#5861 Female Left leg 68 years old Cause of death: Huntington's Chorea</td>
<td>1</td>
<td>8</td>
<td>Yes</td>
<td>4</td>
<td>4</td>
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<td>N/A</td>
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<td>6</td>
<td>Yes</td>
<td>13</td>
<td>13</td>
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<td>#5861 Female Left leg 68 years old Cause of death: Huntington's Chorea</td>
<td>1</td>
<td>8</td>
<td>Yes</td>
<td>3</td>
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</table>
Cadaver Cohort Comparison Study

S=Traditional Surgical
W=Surgical with Wire Localization
P=Radiological/Percutaneous US

APPENDIX 4
**Cadaver Cohort Comparison Study**

**Time in Minutes to Remove Foreign Body**

- **S** = Traditional Surgical Procedure
- **S** = Surgical Procedure with Wire Localization
- **P** = Radiological Procedure - Percutaneous US

**APPENDIX 5**
Cadaver Cohort Comparison Study

Wound closure (number of sutures)

S=Traditional Surgical
W=Surgical with wire localization
P=Radiological/Percutaneous US

APPENDIX 6
APPENDIX 7
Cadaver Cohort Comparison Study

Traditional Surgical
- Failure Rate: 22%
- Success Rate: 78%

Surgical with Wire Localization
- Failure Rate: 11%
- Success Rate: 89%

Radiological/Percutaneous US
- Failure Rate: 0%
- Success Rate: 100%