

ACVR Residency Training Program Application

Submission Date	03-14-2018 20:11:22
Institution Name:	Tufts Cummings School of Veterinary Medicine
Succinctly state the objectives of the training program.	<p>General</p> <p>1) To provide non-degree postgraduate clinical training in Diagnostic imaging. Graduates will be equipped to function either in an academic environment or in a private specialty practice.</p> <p>2) The resident will be eligible to apply for the qualifying examination of the American College of Veterinary Radiology (ACVR) upon satisfactory completion of this program. The minimum standards for this program have been approved by the AVMA according to the guidelines provided by the ACVR.</p> <p>Specific objectives (both small and large animal):</p> <ol style="list-style-type: none">Teaches fundamentals and clinical application of diagnostic radiology.Teaches fundamentals and clinical application of ultrasonography.Teaches fundamentals and clinical application of nuclear medicine.Teaches fundamentals and clinical application of CT.Teaches fundamentals and clinical application of MRI.Teaches fundamentals and clinical application of interventional techniques and fluoroscopyTeaches fundamentals of radiobiology, physics, radiation protection, radiation dosimetry, and radiation safety.Provides experience in teaching Diagnostic imaging to veterinary students (formal classroom lectures and small groups).Provides guidance in designing, conducting, and preparing a publication of a clinically oriented research project.Provides experience with teleradiology
What is the total length of the training program?	38
What are the responsibilities of the resident in the remaining non-clinical portion of the program?	<ol style="list-style-type: none">Board exam preparationDesign and complete a clinical research projectWrite and submit the results of research project to peer-reviewed journal and prepare presentation to ACVR meetingWrite or participate as an author on other projects or papersPrepare in house lectures, seminars, participate in imaging labsAttend physics course, lectures by faculty in radiation biology, CT and MRI2 week study in area of resident's interest (usually cardiology)10 days vacation per year
Who is the Director of Residency training?	Mauricio Solano
What percentage of this individual's time is committed to clinical service and teaching of residents?	60%
Roentgen diagnosis	Trisha Oura 70%

Diagnostic ultrasound	Dominique Penninck 50%
Computed Tomography	Amy Sato 75%
Magnetic Resonance Imaging	James Sutherland-Smith 50%
Nuclear Medicine	Mauricio Solano 50%
List the names and percentage clinical commitment of additional imaging faculty in the program, and their area(s) of instructional responsibility.	Dr Ryan King DVM, DACVR . Ultrasound 25%, MRI 25% CT, 25% Radiology 25%
	Biosketch ALL FACULTY.docx
ACVIM	Mary Labato
ACVIM	Cindy Webster
ACVS	Mike Kowaleski
ACVS	Jose Garcia
ACVP	Samuel Jennings
ACVP	Joyce Knoll
Briefly describe how the program meets the facility requirements.	

2 routine (DR and CR) small animal radiographic suites.
 1 (CR), contrast special procedures and interventional small animal radiographic suite
 1 (DR), large animal radiographic suite, 2 ultrasound rooms,
 1 CT suite,
 1 MRI suite
 1 nuclear medicine suite.
 2 interpretation/dictation/rounds rooms
 1 bullpen area with PCs, medical grade monitors, voice recognition software and anatomy specimens.

Filmless department.

All working areas and imaging modalities communicate with PACS—Carestream version 12 DICOM software. Two servers (main and backup). Paperless Hospital medical record system (stringsoft).

Small Animal Routine room #1 –
 OTC 12 DELL CM80 EV800
 Touch screen display for SID and angulation
 Ceiling mount Telescoping arm , Electromagnetic brake for telescopic lift , automatic collimator with vertical tracking capability, Elevating table top (800lb patient load).
 Del Medical CM Series DR 80 kW, 100 mA, High frequency Three Phase Generator.
 Smart DR panel 1717G.

Usage-50% of the small animal caseload,

Small Animal Routine Room #2
 Quantum quest HD series Radiographic system with floating top
 Usage-20 % small animal case load. Carestream CR 850

Small Animal Specials room:
 Shimadzu RS-110 90/30 R/F digital fluoroscopy system interfaced with InfiMed FC 2000 digital system (without subtraction option) to send digital images/cine-loops to PACS.
 Carestream CR 850
 Usage- 30% of routine small animal studies, 100% of angiographic fluoroscopic procedures.

Large Animal x-ray room
 Philips Maximus C1250 X-ray generator with overhead tube column.
 Portable x-ray unit Omron 90 kvp mAs 20.
 DR EKLIN digital detector Usage-90% equine studies. 10% exotics, pocket pets.

C-ARM
 OEM-GE 9800 Vascular package for interventional procedures.
 100% of intraoperative studies

Ultrasound room 1 has two units:
 Phillips IU 22, phillips epiq TG,
 Usage-100% small animal clinical cases and research with > 4 transducers each unit. Lowest frequency (8-5) MHz. Highest frequency 18.5 MHz

Ultrasound room 2: Toshiba applio
 ultrasound machine equipped with 4 transducers. Usage-100% small animal clinical and research cases

Computed Tomography:
 Toshiba Aquilon 16 slice Unit. Retrofitted with large animal table to perform equine patients.
 Usage 80% small animal, 10% research, 10% equine.

MRI:
 Siemens Symphony 1.5 Tesla MRI scanner. Large animal table. Usage 80% small animals, 15% large animals, 5% research

Nuclear Medicine:
 Software- 1 Mirage acquisition/processing Nuclear Medicine Station
 Hardware- 57PMT IS2 digital rectangular nuclear medicine camera with ultrascan lifting system.
 Usage-85% bone scintigraphy in horses, 10% small animal studies, 5% research

miscellaneous
 Kodak DryView medical laser imager 8900
 3-D printer interfaced with CT unit.

Indicate the approximate number of patients seen annually by the home institution?	18400 (17000 small + 1400 large)
What is the annual imaging caseload?	13000
	Small Animals (canine, feline): 17000 Large Animals (equine and food animals): 1400 Exotic Animals: 1000 (included in the small animal cases)

Small Animal Radiology: 7000 (dogs, cats, exotics)
Large Animal Radiology: 1200 (horses, camelids, small ruminants)
Abdominal Ultrasound: 3665 (dogs, cats, exotics)
Computed Tomography: 600 (small, large, exotics)
Nuclear Medicine: 200 (small, large)
Magnetic Resonance Imaging: 700 (small, large)
Other (specify): 3000 (equine ultrasound service)

Please check which of the following types of imaging cases the residents will have exposure to during the residency:

Small Animal Echocardiography
Large Animal Ultrasound
Nonabdominal Small Animal Ultrasound (i.e. cervical, musculoskeletal)
Food Animal
Exotics
Teleradiology/Referral Imaging

What percentage of imaging reports are typically available within 48 hours after the examination is conducted in typewritten or electronic form?

90-95% all reports in electronic format in draft form

Of the preliminary reports generated from the imaging caseload what percentage are initially produced by the resident?

95%

What percentage of the resident reports are reviewed by the imaging faculty prior to finalization of the report?

100%

When preliminary resident reports are reviewed and edited by the imaging faculty responsible for training, what percentage of the time are two or more faculty present?

60-80%

Small Animal Radiology: 8976 (resident signing report)
Large Animal Radiology: 1539 (resident signing report)
Abdominal Ultrasound: 2107 (resident signing report)
Computed Tomography: 345 (resident signing report)
Nuclear Medicine: 256 (resident signing report)
Magnetic Resonance Imaging: 403 (resident signing report)
Elective (any of above):
Required elective (specify): 70 cardiology
Total:

If your program does not offer formal courses in any or all of these topics please indicate how these educational objectives for each are met. Use the button below to upload additional information as necessary.

RESIDENT TRAINING RADIATION BIOLOGY LECTURES-review of Hall textbook--prepared by Dr Amy Sato. After hour sessions 5 pm to 7 pm.

PHYSICS COURSE OUTLINE (UMASS MEDICAL)

Course Outline- Physics of Radiology and Nuclear Medicine, Michael King, University of Massachusetts. Meets every week for two hours. 10 months

- Modern Physics concepts: Quantum nature of radiation, electromagnetic spectrum, units of measurement, nature and origin of electromagnetic radiation with emphasis on visible, UV, gamma-ray and x-ray part of the spectrum.
 - Production of ionizing radiation, x-ray tubes and circuits. X-ray generators (single phase, 3- phase, high frequency). X-ray beam filtration, X-ray spectra and energy. X-ray tube power ratings and practical limitations. X-ray focal spots and how they affect tube loading and geometric unsharpness. Extrafocal radiation (origin and effects). Beam restriction and collimation.
 - Interactions of radiation and matter (photoelectric, Compton, coherent scattering), exponential law of attenuation.
 - The radiographic image (concepts of contrast and resolution) Modulation Transfer Function (MTF), Wiener spectrum and noise. Some applications of Fourier analysis to radiographic systems. Geometry of radiographic image. Origin and nature of x-ray scatter. Effect of scatter on subject contrast. Antiscatter mechanisms, grids and air gaps, automatic exposure controls. Radiation quantity and quality, radiation detectors.
 - Image receptors: Radiographic screens, radioluminescent materials, physical and photographic characteristics of x-ray film, photostimulable phosphor technology for digital radiography.
 - Image recording techniques (laser printing methods, physical requirements).
 - Fluoroscopy: Image intensification techniques (concepts, units and noise concerns). The physics and engineering of modern image intensifiers, video cameras and charge-coupled devices. Cineangiography, image viewing and recording. Bandwidth limitations. Television techniques and electronic x-ray imaging. Digital subtraction angiography.
 - Conventional tomography. Magnification radiography (advantages and limitations).
 - Mammography: Mammographic equipment and image receptors. Quantitative aspects of the mammography image. Future outlook of digital mammography.
 - Computed tomography: mechanisms of contrast, reconstruction, equipment requirements, spiral scanning techniques.
 - Computers and Teleradiology: Image data communication, archiving and display requirements and digital radiography.
 - Nuclear Medicine Imaging: Nuclear emissions and their applications, nuclear counting statistics. Gas, scintillation and solid state detectors, nuclear spectroscopy and gamma camera imaging spectroscopy, radionuclide generators, concepts of Single Photon Emission Tomography (SPECT) and Positron Emission Tomography (PET). Medical Internal Radiation Dosimetry (MIRD) calculations.
 - Radiation effects and radiation protection: Basic radiobiological aspects, Radiation protection measures, and practices, regulatory aspects. Radiation dose precautions in fluoroscopy. The concept of effective dose.
 - Ultrasound: Basic interactions, transducers and image acquisition techniques. Doppler effect, applications and imaging.
- Basic principles of MRI and imaging techniques

MRI MINI COURSE

Given by Dr James Sutherland-smith

- Instrumentation, Digital images, Resolution, Signal/Noise
- Magnetism
- Larmor frequency
- Faraday's Law
- T1, T2, T2* relaxation
- Spin echo techniques-T1, T2 and intermediate-weighted pulse sequences
- Gradient echo, T2* weighted sequences
- Inversion recovery-STIR, FLAIR images
- Fat Saturation
- MRA
- Contrast enhancement- with T1-weighting and T2*-weighting
- Clinical case presentations

Over the last five years, what is the average number of peer reviewed publications, on which the IMAGING faculty listed under Direction and Supervision in IV, are included as authors?

37 publications total in five years (see biosketches)

What is the number of publications/submissions expected of a resident completing the program?

1 (one) Peer reviewed publication as a first author usually Veterinary Radiology & Ultrasound.

If this is an established program, what percentage of residents have made formal research presentations at the annual ACVR or equivalent national meeting?

100%

<p>Is an advanced degree a requirement of the training program?</p>	<p>no</p>
<p>How many lectures or scientific presentations are expected of each resident during the course of their training?</p>	<p>Three presentations hospital wide. Once per year of training. One formal lecture ultrasound course third year curriculum</p>
<p>Did all of your current resident(s) adequately complete the last six months of training?</p>	<p>Yes</p>
<p>List the current members of the residents' review committee.</p>	<p>ALL ACVR FACULTY in program Clinical sciences Co-Chair DR Mary Labato (ACVIM)</p>
<p>List the internal mechanisms in place to protect your resident if conflicts arise.</p>	<p>Residency Director is the representative of the residents. His role is to keep resident updated on his/her progress through semiannual reviews. Conflicts are brought to director by residents or faculty and meetings to solve them are set by director.</p> <p>Chair and co-chair of Department offer semiannual meetings (without ACVR faculty present) to discuss any issues related to resident performance, program effectiveness.</p> <p>Tufts Human resources offer compulsory training in Harrasment in the workplace.</p> <p>Imaging section offers training in communication, and stress relief.</p> <p>On campus counseling center (confidential) as part of workplace health benefit.</p>
<p>What is the nature and scope of the teaching file available to residents?</p>	<p>An EXCEL file, categorized by case number, owners name, species modality, coded according to diagnosis/anatomical area. Currently collection contains over 7500 cases. Collection is maintained and updated daily by faculty and residents on clinics and back up daily by IT department in public drive.</p> <p>Ultrasound teaching video loops stored as AVI, WMV and quick time format is available in dedicated Mac platform connected directly to ultrasound machine for updating purposes. Collection is stored in public network drive. Searchable through general excel teaching file.</p> <p>Echocardiographic case studies are available on CD ROM, videotape and film hard copy.</p>
<p>How is it maintained/updated?</p>	<p>Collection is maintained and updated daily by faculty and residents on clinics and back up daily by IT department in public drive.</p> <p>Ultrasound Collection is maintained by ultrasound technicians and updated by clinician on clinics.</p> <p>Cardiology Collection is administered by cardiology section independently of the imaging section.</p>

On average how many Known Case Conferences are conducted annually?

1 (one) PER WEEK.

What is the geographic relationship between the nearest medical library and the training program?

Veterinary school campus library—walking distance.

Residents have access to most of the major veterinary and imaging journals through the Grafton Campus library or the Tufts Medical School library in Boston (hard copy but mostly electronically). Tufts is a member of the medical library consortium of New England which offers redundant access to medical journals through mayor libraries of major universities in the state of Massachusetts. The tufts library pays for electronic access to journals that offer the service. The section also pays for our residents to receive a personal copy of the Veterinary Radiology and Ultrasound journal. Bound back issues are available in the radiology secretary's office and campus library. A library of anatomy and imaging textbooks and photocopies of imaging articles are available in the interpretation room. The library is updated on a need basis with multiple additional new titles added at the end of the fiscal year. Anatomic specimens are also available to them. Each resident uses PAPERS software to keep their electronic library on their personal computers.

Provide the pass rate for first time, second time, etc for both the preliminary and certifying exams for your residents for the past 5 years. For example, for all residents finishing your program 5 years ago (Year 5): x number passed prelim 1st time, y number passed certifying exam 1st time, z number was unsuccessful.

	Year 5	Year 4	Year 3	Year 2	Year 1
Passed preliminary exam 1st time	50	100	100	100	100
Passed preliminary exam 2nd time	100				
Passed preliminary exam after 2nd time					
Passed certifying exam 1st time	100	100	100	50	50
Passed certifying exam 2nd time				50	50
Passed certifying exam after 2nd time					
Unsuccessful in all attempts					

[sample schedule Tufts University DI residency.docx](#)