

ACVR Diagnostic Imaging Residency Training Program Application

This application is required for institutions desiring ACVR accreditation of a new residency training program and for institutions requesting re-accreditation of an existing program.

Before beginning the application process, all applicants should review the most recent version of the [ACVR Residency Program Essential Training Standards and Requirements](#) (RPE) document (accessed from the Essentials Homepage) in detail. Use the RPE as a reference when completing the application form, as the contents you provide herein will be evaluated by the Residency Standards and Evaluation Committee (RSEC) against the published RPE standards. This application form follows the headings of the RPE. All terms used in this application have same definitions as those in the RPE, and no information provided in the application form itself will supersede that published in the RPE. During the application review process, the Chair or Assistant Chair of the RSEC may contact the applicant for additional information or clarification.

**Note: If you wish to save your submission and complete it later, click the save button located at the bottom of the pages. You will be emailed a link to complete your form at a later date.*

ACVR Residency Training Program Application

Program Summary

The Residency Director of the program is expected to be the primary applicant and contact person for this application. The Residency Director must be located at the primary training institution.

| | |
|---|--|
| Institution Name | Virginia Maryland College of Veterinary Medicine |
| Residency Program Director Name | Gregory Daniel |
| Residency Program Director Email | GDaniel@vt.edu |

Program Type

What type of residency program is being requested?

Traditional Residency Program

If approved, what is the proposed start date of this residency program?

Saturday, July 1, 2023

Objectives

Succinctly state the objectives of the training program.

The objective of this three year program is to train the graduate veterinarian in the specialty of diagnostic imaging, including small and large animal diagnostic radiology, diagnostic ultrasound, computed tomography, magnetic resonance imaging and nuclear medicine. The training is two fold: 1) basic principles of physics, radiation biology and radiation safety, 2) development of interpretative skills and competency in all of the above imaging modalities. The ultimate goal is to enable the resident to successfully complete the ACVR board examination. In addition, the program is designed to help the resident develop skills in design, data collection and analysis of research data leading to presentations and publications.

Training Period

What is the total length of the training program? 36

What is the anticipated length of supervised clinical training a resident will experience during this program? 30

Will the resident(s) in this program be eligible to take the ACVR Preliminary Exam in September of their third year? Yes

What are the responsibilities of the resident(s) during non-clinical portions of the program?

Independent study of material associated with the the didactic portion of residency training which will include all materials relative to the objectives of the ACVR board exam

Successfully complete coursework within the residency program

Prepare presentation materials for seminars

Develop and conduct a research project under the supervision and guidance of one or more faculty members. This may include the writing of a grant proposal to obtain funding in support of the project; write a scientific paper that details the results of the project, to be submitted to Veterinary Radiology and Ultrasound or other peer-reviewed journal; and presenting the finding of the project at the ACVR annual meeting.

ACVR Residency Training Program Application

Direction and Supervision

When calculating time commitment in this section, you may consider a 100% (full time) duty schedule to consist of 48 weeks per year with 8 hours per day or 40 hours per week.

Residency Director

Please review the Residency Director requirements and responsibilities in the [ACVR Residency Program Essential Training Standards and Requirements](#) (RPE) document. Note that the Residency Director will be required to provide at least 24 weeks of clinical duty per year in primary support of residents in this program and to meet all other qualifications of a Supervising Diplomate.

Is the applicant Residency Director for this program prepared to meet these requirements? Yes

What percentage of the Residency Director's time is committed to clinical service at the primary training institution? 80

How many weeks per year will the Residency Director be on clinical service and teaching residents at the primary training institution? 35

ACVR Residency Training Program Application

Additional Training Diplomates

Please review the definitions and responsibilities of [Supervising Diplomate and Supporting Diplomate](#) in the RPE document. Note that Supervising Diplomates will be required to provide at least 10 weeks of clinical duty in primary support of residents in this program, and are expected to participate in all facets of residency training. Supporting Diplomates aid in residency training, but provide support that is limited, as by modality (e.g. only works in ultrasound), time commitment (e.g. clinical duty < 10 weeks per year), or other constraints that prevent them from qualifying as a Supervising Diplomate.

Provide a copy of affiliation agreements with any diplomates that are located at an external institution (see Affiliation Agreement item at the end of this section).

Excluding the Residency Director, please list all training diplomates who will act as Supervising Diplomates of this residency program. Indicate the approximate number of hours per year each supervisor will be scheduled on clinical duty with primary support of residents and, if applicable, any specific areas of instructional responsibility (e.g. trains mostly in small animal, trains mostly in MRI, etc). If a 'Supervising Diplomate' position will be comprised of multiple radiologists, please list the cohort as a single entity or institution for this question (e.g. "teleradiologists" or private institution name)

Name: Martha M Larson

Hours/Year: 400 (retired but will be employed by the University for at least 10 weeks a year)

Specific Areas and/or Limitations of Instructional Responsibility: Diagnostic Ultrasound, Radiology, Didactic instruction, KCC and Mock Oral Exams

Institution: Virginia Maryland College of Veterinary Medicine

In addition to ACVR/ECVDI Diplomates, the program must arrange for the resident(s) to have direct access to specialists in other areas. Please identify one member in each of the specialty colleges listed below that has agreed to support this program through clinical activity that allows regular interactions between the specialist and the diagnostic imaging residents (e.g. discussion of diagnostic work up, imaging findings, or patient outcomes, and/or participation in interdisciplinary rounds, etc). Indicate whether the specialist is located on-site at the primary institution at an external institution. Provide a copy of affiliation agreements with any non-ACVR/ECVDI diplomates that are located at an external institution (see Affiliation Agreement section at the end of this application). Upon completion of this application, the below individuals will receive an email requesting acknowledgement of their support of your residency program.

| | |
|---------------------------------|--|
| ACVIM Member Name | Tim Bolton |
| ACVIM Member Institution | Virginia Maryland College of Veterinary Medicine |
| ACVIM Member Email | timothy18@vt.edu |
| ACVS Member Name | Otto Lanz |
| ACVS Member Institution | Virginia Maryland College of Veterinary Medicine |
| ACVS Member Email | olanz@vt.edu |
| ACVP Member Name | Tanya LeRoith |
| ACVP Member Institution | Virginia Maryland College of Veterinary Medicine |

ACVR Residency Training Program Application

Resident:Supervising Diplomat Ratio

The number of residents in the program cannot exceed twice the number of Supervising Diplomates **on-site**. Remote Supervising Diplomates will not count when calculating the maximum residents allowed in a given program.

What is the maximum number of imaging interns you will have enrolled in this training program at any given time? 2

ACVR Residency Training Program Application

Facilities

Review the Facility Requirements listed in the RPE document. Note also that residents should have opportunities to be involved with image acquisition and protocol set-up. Does this residency training program provide on-site access to modern equipment for the following modalities?

| | |
|------------------------------------|---|
| Digital or Computed Radiography | <input checked="" type="checkbox"/> Yes |
| Fluoroscopy | <input checked="" type="checkbox"/> Yes |
| Ultrasound with Doppler Capability | <input checked="" type="checkbox"/> Yes |
| MRI | <input checked="" type="checkbox"/> Yes |
| Fan-beam CT | <input checked="" type="checkbox"/> Yes |
| Nuclear scintigraphy | <input checked="" type="checkbox"/> Yes |

Briefly describe how this program meets the facility requirements, including the specific type of CT and MRI units available. Explain how your program will train residents in modalities for which equipment is not located on site, providing affiliation agreements if applicable. (see Affiliation Agreement item at the end of this section)

CT- Toshiba Aquilion 64

MR

Current: Philips Intera 1.5T

Purchased: Siemens Magnetom Vida 3T to be installed summer 2023

US: Samsung NeuroLogica and Philips iU22

R/F Room: Philips CombiDiagnost R90

Room 2: Siemens Multix Pro

C-arm: Philips BV Endura

Large Animal (overhead and portable units)

Overhead: Sedecal OTC-280
Portable: GE AMX 4 Plus
Portable: Min Xray HF 100/30 ultralight

Nuclear Medicine

Gamma Camera - custom built/refurbished LFOV 15-20"
Oasis Computer System - with Motion Correction

PACS - Asteris

Please describe how residents will gain experience in image acquisition and protocol set-up for each of these modalities (excluding nuclear medicine).

At the beginning of the residency, the residents rotate with our radiology technicians to learn the operations and positioning associated with diagnostic imaging. They will learn details of equipment function and design during the didactic courses (BMVS 6094) including physics of diagnostic radiology, computed tomography, magnetic resonance imaging, ultrasound and nuclear medicine. As they develop skills and competencies they will begin to take over direction of clinical services which requires detailed interactions with the technicians relative to image acquisition and protocols for CT and MR sequences. They will be personally involved in image acquisition for diagnostic ultrasound and special radiographic procedures using fluoroscopy.

ACVR Residency Training Program Application

Clinical Resources and Training Content

Review the clinical resource and training content requirements listed in the RPE document

What is the average annual caseload at the primary institution over the past 3 years? This number will include all patient visits whether or not they contribute to the annual imaging caseload. 14161

What is the average annual imaging caseload at the primary institution over the past 3 years? Each body region imaged for a given patient (e.g. thorax, abdomen, spine, etc) will count as a single study. 6308

What is the average annual imaging caseload at the primary institution over the past 3 years in the following categories?

| | |
|-----------------------------------|------|
| Small animal radiology | 3074 |
| Large animal radiology | 177 |
| Abdominal ultrasound | 1661 |
| Non-abdominal ultrasound | 185 |
| Computed tomography | 575 |
| Magnetic Resonance Imaging | 365 |
| Nuclear scintigraphy | 76 |

Indicate the approximate species breakdown of the imaging caseload at the primary institution in the following categories:

Small animals (canine, feline): 90

Large animals (equine, bovine, porcine, etc.): 9

Avian, Exotic, and Wildlife animals: 1

Which of the following types of imaging cases will the resident(s) have direct, on-site exposure to at the primary institution during the residency program?

Echocardiography

Yes

Large animal ultrasound

Yes

Nonabdominal small animal ultrasound (i.e. cervical, musculoskeletal)

Yes

Food/fiber animal imaging

Yes

Exotics imaging

Yes

Teleradiology/Referral imaging

Yes

Explain how the resident(s) in this program will gain experience in any of the above types of imaging cases that are NOT available at the primary institution. Provide affiliation agreements, if applicable. (see Affiliation Agreement item at the end of this section).

The average number of cases in the past 3 years has been severely impacted by COVID. The numbers in 2022 have nearly returned to the pre-COVID level but the three year average that includes 2020 and 2021 which drastically reduce the number of reported cases. The total imaging caseload for 2022 was 7,551.

These case numbers represent caseload in the radiology section of the Veterinary Teaching Hospital. They do not include caseload seen on ambulatory field service or cases at the Equine Medical Center in Leesburg Virginia. The Animal Cancer Care in Research Center (ACCRC) in Roanoke has its separate radiology, ultrasound, computed tomography, and MR facilities. Radiology and Computed tomography cases from the Animal Cancer Care and Research Center (ACCRC) are included in the above numbers because the radiology service reads the studies and provide reports. The caseload at ACCRC has grown dramatically in 2022. The center opened in 2020 during the COVID pandemic and the 3 year average is much less than the current 2022 numbers.

The residents do not typically perform primary large US procedures, but do observe large animal US performed by LA clinicians. Our exotic caseload is low, but is supplemented by cases from other institutions, with cases used in KCC

ACVR Residency Training Program Application

What percentage of the total imaging caseload at the primary institution results in a written imaging report being generated by either the residents or the training radiologist diplomates in this program?

94

If < 99%, please provide a brief explanation and account for this when calculating the number of cases that each resident will interpret.

Ambulatory field service and the in-house equine podiatry center will take their own radiographs. The radiographic numbers included in this report do not include cases generated outside radiology. Clinicians will often consult with radiologist on these cases but a formal report is not generated.

What percentage of the preliminary reports generated from the imaging caseload are initially produced by the resident(s) in this program? 80

Does this institution concurrently support the training of diagnostic imaging interns? Yes

If yes, indicate the maximum number of imaging interns the institution will train concurrently, what percentage of the preliminary reports generated from the imaging caseload will be initially produced by the intern(s), and how this affects the resident imaging report caseload.

Diagnostic imaging interns are not a routine part of this program. We currently have a diagnostic imaging intern but this is the first time in 10 years and we are not planning to continue a diagnostic internship program in the future. Currently a diagnostic intern is paired with the faculty radiologist or a chief (radiology) resident. Cases are reviewed the following morning during radiology rounds.

What percentage of resident-generated reports are reviewed by training diplomates prior to finalization of the report? 90

What is the average turnaround time for resident-generated preliminary reports to be finalized by training diplomates?

95% of the cases have a draft report the day of the study and 99% are approved and finalized by the next business day. Previous day's cases are reviewed each morning from 8 to 9 AM by the attending radiologists. Reports generated by radiology residents having obtained chief resident status (requiring approval of the hospital board and hospital director) are not required to be co-signed by a faculty radiologists but cases are still reviewed during morning rounds.

What percentage of all imaging reports (resident and diplomate generated) is finalized and available to requesting clinicians within 48 hours after the exam is submitted for radiologist consult? 99

Please describe how after-hours/weekend/holiday cases are handled at the primary institution. How does this affect resident-reported imaging caseload?

Residents share emergency call for after hours/weekends/holidays interpretations and procedures. During the first year of their residency program, the attending radiologist is on call for backup and will review each case with the resident. As the residents competency allows, typically by the second year, the on-call resident will consult with the back up attending radiologist on an as-needed basis. By the third year of the program, the attending radiologist will review after hours cases the morning of the next business day. Radiology provides ultrasound service each day the VTH is closed (weekends/holidays) from 9 to 11 AM with the attending radiologist providing backup as described above.

For each category below, calculate the approximate number of cases that a single resident will interpret at the primary institution with radiologist feedback during the course of the entire residency program. These numbers should be calculated using the annual imaging caseload adjusted to include only those with written reports generated by the residents. In general, this number should then be divided by the total number of residents in a program during a given year.

If external rotations for the resident(s) are employed to increase the resident caseload in any given category, please be sure to upload affiliate agreements that include the expected number of reports that residents can expect to generate (with radiologist feedback) for cases in those categories.

Small animal radiology 5891

Large animal radiology 205

Abdominal ultrasound 1662

Non-abdominal ultrasound 185

Computed tomography 576

Magnetic resonance Imaging 365

Nuclear scintigraphy 77

How many ultrasound exams will a single resident perform with radiologist supervision and feedback during the course of the entire program? Scans for which the resident writes a report but does not acquire images are excluded. 1847

Do residents in this program have ample hands-on training and practice opportunities to become proficient in the performance of ultrasound guided fine needle aspirates and biopsies?

Yes

Please indicate whether this training program includes formal courses in any of the following topics:

Physics of Diagnostic Imaging

Yes

Radiobiology

Yes

Nuclear Medicine

Yes

Ultrasonography

Yes

Computed Tomography

Yes

Magnetic Resonance Imaging

Yes

Other

No

Briefly describe the formal courses that are available for the resident(s) in this program by indicating the institution, course title, course number, and credit hours as well as any other relevant information. For any topics for which formal course work is not provided for the resident(s), please explain how educational objectives in these topics will be met.

BMVS 6094, Board Certification Topics, 1 credit hour/semester

During the first two years of the program, the resident take this course which is offered during the spring and fall semesters (15 weeks a semester). The resident take the course 4 times with the topics changing each time the course is given. The courses cover the topics listed above. Reading assignments are made for each week of the semester and the residents meet with the faculty each week to discuss the weekly topics. The learning objectives of the course mirror the ACVR qualifying board objectives. There is a comprehensive midterm and final exam given each semester and a letter grade will be assigned based on a standardize grading scale.

BMVS 6074, Clinical Topic Rounds 1 credit hour/semester.

This course provided a structure for evaluation for clinical rounds with the residents. This is a Pass/Fail evaluation

BMVS 6064 Advanced topics in Veterinary Medicine 1 credit hour/semester.

This course provided a structure for evaluation of journal club with the residents. This is a Pass/Fail evaluation

BMVS 6084 Veterinary Specialty Clinics 3 credit hour/semester.

This course provided a structure for evaluation for clinical service provide by the residents. The is a letter grade based on an evaluation rubric than a standardize across the department for clinical residents.

Do residents have access to a majority of the written pathology reports that are generated from patients included in this imaging caseload?

Yes

Will the resident(s) in this program attain an advanced degree (MS, PhD) at the conclusion of the program?

Yes

ACVR Residency Training Program Application

Research Environment

Review the Research Requirements listed in the RPE document.

Over the last five years, what is the average number of peer reviewed publications on which the training diplomates (Supervising and Supporting diplomates) of this program are included as authors? (total number of publications in last 5 years among all training diplomates divided by the number of training diplomates)

5.5

How many peer-reviewed publications are expected of a resident completing the program?

1

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

80

Briefly describe if/how residents are encouraged to engage in investigative work and what mechanisms are in place for training diplomates to support this work.

The residents in the program are enrolled in the graduate School of Virginia Tech in a Master's of Science degree program. They are required to complete a research project which could include a retrospective clinical study. They will present their research ideas in a departmental seminar series and provide yearly updates and a final seminar presentation. They will have to defend their project to their faculty committee in a final exam. They are encouraged to present their findings at a national meeting (preferably the ACVR meeting) and published their findings (preferably in VRU)

Educational Environment

Review the Educational Environment expectations listed in the RPE document.

Please list and enumerate the formal presentations that are expected of each resident during the course of their training. In general, didactic lectures, departmental seminars, scientific presentations, Continuing Education presentations, and similar are considered "formal". Informal topic rounds, journal club, small group teaching (like student rounds), student labs, and similar events should not be included.

The residents in the program graduate students. They are required to take a seminar course which provides background and training in public speaking and formal presentations. They will be required to present to seminars as part of this course. In addition, each resident will make a formal presentation at the department's intern and resident seminar series each year of their training. They will give at least 1 didactic lectures in the DVM curriculum and will typically submit an abstract for presentation at the ACVR meeting.

Briefly describe the type and extent of teaching opportunities that are provided to the resident throughout the training program.

The residents are involved in daily student rounds. These are structured rounds with the student on the radiology clerkship and are designed to cover the core clinical competences required for diagnostic radiology. They will also have limited didactic lecture assignments. They are involved in informal discussions on current clinical cases with the students.

Briefly describe the nature and scope of the teaching file available to the resident(s) in this program and how it is maintained/updated.

All of the student rounds cases are accessible in our PACS system under specific file folders (orthopedic, thoracic and abdominal cases). These include all cases used during morning and afternoon student rounds. The College uses Canvas as their teaching information system and it also contained extensive example cases, lectures, learning objectives and practice cases. The faculty maintain an extensive interesting case list (which is shared between faculty and residents). We can also perform keyword searches in both our hospital information system and our PACS system

How many Known Case Conferences are conducted annually? 17

Describe the nature and frequency of resident rounds ("other educational events") planned for this program. You may upload an example schedule with the general program schedule that is requested at the end of this application.

Morning Rounds:

The radiology residents have daily morning rounds with the Radiologist from 8-9 that reviews the previous day's cases. This will also include selected teleconsulting referral cases.

Weekly Rounds:

There are weekly rounds on Fridays (9-10) with the radiology faculty. On a rotating 3-week schedule, Journal club is held the first 2 weeks and KCC the third week.

Resident/Intern Seminar:

During the fall and spring semester there are departmental seminars which are given once a month and will include presentations from all house officers (intern and residents).

MR Rounds:

There are once monthly joint MRI rounds between the neurology and radiology groups.

Describe how the resident(s) in this program will attain direct and consistent medical library access and/or how they will access research tools and medical literature including the suggested references listed in the ACVR Preliminary Examination study guide.

All faculty and residence have access to all University Libraries, including the main campus and six branch locations, collections, and services. The University Libraries provide access to 1.9 million physical items, 1.4 million eBooks, 146,000 eJournals, 83,000 streaming videos, and over 700 online databases and search engines. The Veterinary Medicine (Vet Med) Library, located within the College, houses 11,880 physical items to support clinical veterinary medicine as well as research in the veterinary sciences and public health programs.

ACVR Residency Training Program Application

Evaluation and Protection of Residents

For existing programs, list the names, email contact information, and start/end dates of your current residents.

Michael Ciepluch, mciepluch@vt.edu, July 2020 to July 2023
Michael Edwards, mredward@vt.edu, July 2020 to July 2023

Did all of your current residents adequately complete the last 6 months of training?

Yes

List the current members of the resident review committee.

Michael Ciepluch
Gregory Daniel
Martha Larson
John Rossmeisl
Bobbi Conner

Mike Edwards
Gregory Daniel
Martha Larson
Richard Shinn
Sheryl Countermarsh-Ott

Describe the internal mechanisms in place at your institution to protect the resident(s) if personal or organizational conflicts arise. Include the management hierarchy for residents and procedures by which residents would report workplace misconduct.

Conflicts/concerns are initially addressed by the radiology faculty. The all residency programs are overseen by the Department of Small Animal Clinical Science which has in place standards and expectations for the clinical residency programs. Also since the program is couples with a graduate degree, there are standards and expectations that must be met. Conflicts that might arise that are not addressed locally have two mechanisms in place to work our any grievances (Assistant Department Head DSACS, John Rossmeisl oversees clinical residency programs, and the Associate Dean for Graduate Student, Ansar Ahmed. In addition there are counseling services available within the College and on campus if necessary.

ACVR Residency Training Program Application

Appendix

Please provide the following information regarding preliminary and certifying board exam pass rates for residents in your program over the past five years.

Preliminary Board Exam Pass Rate

2020

Number Of Prelim Board Eligible Residents: 0

Number of Residents That Took Prelim Exam: 0

Number of Residents That Passed On 1st Attempt:
0

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

2019

Number Of Prelim Board Eligible Residents: 1

Number of Residents That Took Prelim Exam: 1

Number of Residents That Passed On 1st Attempt:
1

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

2018

Number Of Prelim Board Eligible Residents: 1

Number of Residents That Took Prelim Exam: 1

Number of Residents That Passed On 1st Attempt:
1

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

2017

Number Of Prelim Board Eligible Residents: 0

Number of Residents That Took Prelim Exam: 0

Number of Residents That Passed On 1st Attempt:
0

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

2016

Number Of Prelim Board Eligible Residents: 1

Number of Residents That Took Prelim Exam: 1

Number of Residents That Passed On 1st Attempt:
0

Number of Residents That Passed After Multiple
Attempts: 1

Number of Residents That Have Not Passed: 0

Certifying Board Exam Pass Rate

2020

Number of Certifying Board Eligible Residents: 1

Number of Residents That Took Certifying Exam: 1

Number of Residents That Passed On 1st Attempt:
1

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

2019

Number of Certifying Board Eligible Residents: 1

Number of Residents That Took Certifying Exam: 1

Number of Residents That Passed On 1st Attempt:
1

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

2018

Number of Certifying Board Eligible Residents: 0

Number of Residents That Took Certifying Exam: 0

Number of Residents That Passed On 1st Attempt:
0

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

2017

Number of Certifying Board Eligible Residents: 1

Number of Residents That Took Certifying Exam: 1

Number of Residents That Passed On 1st Attempt:
0

Number of Residents That Passed After Multiple
Attempts: 1

Number of Residents That Have Not Passed: 0

2016

Number of Certifying Board Eligible Residents: 0

Number of Residents That Took Certifying Exam: 0

Number of Residents That Passed On 1st Attempt:
0

Number of Residents That Passed After Multiple
Attempts: 0

Number of Residents That Have Not Passed: 0

Program Schedule

Upload a schedule for your residents that outlines their clinical and non-clinical work over the course of the residency program. This may be a master schedule or duty roster for your entire radiology section, if desired. If available, an example weekly or monthly rounds schedule can also be included.

Affiliation Agreements

Upload digital copies of any affiliation agreements that have not been included elsewhere in this document. Refer to the RPE document for an explanation of what information should be included in such agreements.