

ACVR Residency Training Program Application Form:

Institution Name

Ontario Veterinary College

This document is to act as a guide for institutions desiring ACVR accreditation of their residency training program. It should be used in concert with the requirements set out in the ACVR Essentials of Residency Training document and it follows the headings of that document. It is intended to streamline the application process and help define what information the RSEC needs to evaluate the program. All terms used in this application have same definitions as defined in the Essentials.

II. Objectives:

Succinctly state the objectives of the training program.
--

- | |
|--|
| <ol style="list-style-type: none">1. Provide advanced training and clinical experience in diagnostic radiology, special procedures, ultrasound, MRI, and nuclear imaging.2. Develop skills in routine diagnostic radiography, special procedures, ultrasound, MRI, CT, and nuclear imaging.3. Provide instruction (formal and informal) in:<ol style="list-style-type: none">a. physics of diagnostic imagingb. radiobiology and radiation safetyc. radiation therapy4. Training in scientific writing, literature evaluation, and methods of clinical evaluation.5. Gain teaching experience by providing in house continuing education lectures and participating in student film reading laboratories.6. Provide a basis for a graduate program leading to DVSc.7. Preparation for certification examination by the American College of Veterinary Radiology. |
|--|

III. Training period:

What is the total length of the training program in months?

This program is 48 months in duration with a minimum of 34 months of clinical rotation.

If this is a 4 year program, during what year will the resident be eligible to take the

<p>ACVR Preliminary Exam? If the resident is not eligible to take the exam during the beginning of the 3rd year (September), please state the reason.</p> <p>The resident will be eligible to sit the preliminary exam in September of their fourth year. Due to the requirements of the DVSc program and time taken to perform the research the minimum clinical instruction will not occur by September of the 3rd year.</p>
<p>What is the total duration of supervised clinical training in the program?</p> <p>All of the clinical service will occur under the supervision of a board certified radiologist (34 months minimum).</p>
<p>What are the responsibilities of the resident in the remaining non-clinical portion of the program?</p> <p>The non clinical time will be used for studying, completing the requirements of the DVSc (including grant preparation, performing the research, literature review, and thesis preparation and defense), and vacation.</p>

IV. Direction and Supervision:

Program Director:

<p>Who is the Director of Residency training?</p> <p>Stephanie Nykamp. DVM, Dipl. ACVR</p>
<p>What percentage of this individual's time is committed to clinical service and teaching of residents?</p> <p>50% of time is devoted to clinical service and resident training</p>

Faculty:

Please list the faculty member of the program accepting PRIMARY responsibility for training in each of the following core areas:

Roentgen diagnosis:

Faculty: Stephanie Nykamp
Percentage clinical service: 50

Diagnostic ultrasound:

Faculty: Heather Chalmers
Percentage clinical service: 50

Computed Tomography

Faculty: Robert Cruz
Percentage clinical service 50:

Magnetic Resonance Imaging:

Faculty: Stephanie Nykamp
Percentage clinical service: 50

Nuclear Medicine:

Faculty: Heather Chalmers
Percentage clinical service: 50

List the names and percentage clinical commitment of additional imaging faculty in the program, and their area(s) of instructional responsibility. For each imaging faculty in the program please provide a one page CV documenting their expertise in the area(s) of assigned responsibility.

Stephanie Nykamp, DVM, Diplomate ACVR
Curriculum Vitae

Current Position Assistant Professor, Diagnostic Imaging, Clinical Studies
Diagnostic Imaging Section Chief

Education **Cornell University, Radiology Residency (2000-2003)**

Ontario Veterinary College, Small Animal Internship in Medicine and Surgery (1999-2000)

Ontario Veterinary College, Doctor of Veterinary Medicine (1993-1997)

Selected Publications

1. Mitchell C, Nykamp SG. Radiographic Diagnosis: Congenital Lobar Emphysema in an Old English Sheepdog Puppy. *Vet Radiol Ultrasound*. 2006: 47(5) 465-467.
2. Nykamp SG, Scrivani PV, Pease AP. Computed Tomography and CT-Dacryocystography evaluation of the nasolacrimal apparatus: A technique and its clinical application in 4 dogs and 1 horse. *Vet Radiol & Ultrasound*, 2004: 45(1), 23-28.
3. Nykamp SG, Dykes NL, Zarfoss MK, Scarlett J. The pattern of thyroid pertechnetate uptake as a predictor of hypothyroidism post radioactive iodine treatment: 165 Cases (1992-2002). *J Am Vet Med Assoc.*, 2005:226(10), 1671-1675.
4. Squires Bos A, Brisson BA, Holmberg DL, Nykamp SG. Determining lateralization of thoracolumbar intervertebral disc extrusion in small breed dogs using the ventrodorsal myelographic projection. *J Am Vet Med Assoc.* 2007:230(12), 1860-1865.
5. Liu X, Hart EJ, Petrik JJ, Nykamp SG, Bartlewski PM. Relationships between ultrasonographic image attributes, histomorphology and proliferating cell nuclear antigen expression of bovine antral follicles and corpora lutea *ex situ*. *Reprod Dom Anim*, 2008 43, 27-24.
6. Bracamonte JL, Boure LP, Geor RJ, Runciman J, Nykamp SG, Cruz AM, Teeter MG, Waterfall H. Evaluation of a laparoscopic technique for collection of serial full-thickness small intestine biopsies in standing sedated experimental horses. *Am J Vet Res*. 2008 69(3), 431-439.
7. Koenig JB, Martin C, Nykamp SG, Mintchev MP. Use of multi-channel electrogastrography for non-invasive assessment of large intestinal myoelectrical activity in horses. *Am J Vet Res*. 2008 69(6), 431-439.
8. Poma R, Chambers H, daCosta RC, Konyer NB, Nykamp S, Dobson H, Milgram NW. MRI measurement of the canine auditory pathways and relationship with brainstem auditory evoked responses. *Vet Comp Ortho Trauma*. 2008 21(3), 238-242
9. Appel SI, Moens NM, Abrams-Ogg AC, Woods JP, Nykamp SG, Bienzle D. Multiple myeloma with central nervous system involvement in a cat. *JAVMA*. 2008 233(5), 743-747.

Book Chapters

1. Pease AP, Nykamp SG, Yeager AE. *Diagnostic Imaging in Farm Animals*. IN: Farm Animal Surgery, Fubini SL, Ducharme N, eds., Saunders, St. Louis Missouri. 2004. pg. 15-21.
2. Mathews KA, Halling K, Nykamp SG. *Acute Abdomen* IN: Veterinary Emergency and Critical Care Manual, Mathews KA, ed. Lifelearn, Guelph Ontario. 2005. pg. 21-31.
3. Nykamp SG. *Equine Thorax*. IN: Textbook of Veterinary Diagnostic Radiology, 5th ed. Thrall D. ed. 2007.

Graduate Teaching

CLIN 6370 Neuroimaging
CLIN 6950 Equine Diagnostic Imaging
CLIN 6330 Advanced Principles of Diagnostic Imaging

**Heather J. Chalmers, DVM, Dipl. ACVR
Curriculum Vitae**

Faculty Appointments:

Ontario Veterinary College, University of Guelph, Guelph, ON 2007-present
• **Assistant Professor**, Department of Clinical Studies

Board Certification:

- American College of Veterinary Radiology, 2006

Selected Publications and Abstracts (relating to computed tomography and ultrasound):

Chalmers HJ, Cheetham J, Dykes NL, Ducharme NG. Computed Tomographic Diagnosis - Stylohyoid Fracture with Pharyngeal Abscess in a Horse Without Temporohyoid Disease. *Veterinary Radiology and Ultrasound*, 2006;47(2).

Chalmers HJ, Dykes NL, Lust G, Farese J, Burton-Wurster NI, Williams AJ, Todhunter RJ. Assessment of bone mineral density of the femoral head in dogs with early osteoarthritis. *American Journal of Veterinary Research*, 2006;67(5).

Chalmers HJ, Cheetham J, Yeager AE, Ducharme NG. Ultrasonography of the equine larynx. *Veterinary Radiology and Ultrasound* 2006;47(5).

Chalmers HJ, Cheetham J, Yeager AE, Ducharme NG. Ultrasonography of the Equine Laryngeal Region: Technique, normal appearance and clinical applications. *World Equine Airways Symposium*, Ithaca NY, July 22, 2005; *ACVR Annual General Meeting*, Chicago IL, December 2005.

Chalmers HJ, Dykes NL, Lust G, Farese J, Burton-Wurster NI, Williams AJ, Todhunter RJ. Increased bone mineral density of the perifoveal subchondral region of the femoral head in dogs with early osteoarthritis. *ACVS Symposium*, SanDiego, CA, October 21, 2005.

Chalmers HJ, Cheetham J, Yeager AE, Ducharme NG. Accuracy of ultrasonography in the diagnosis of recurrent laryngeal neuropathy in horses. *Joint Scientific Meeting of International Veterinary Radiology Association*; Vancouver, Canada, August 2006, *ACVS Symposium*, Washington DC, October 7, 2006.

Robert de J Cruz – Arámbulo, Resume

Degrees, training and present position

Master of Science in Radiological Health Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins Colorado, USA. August, 2000 – August, 2003

Residency Training in Veterinary Imaging at College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins Colorado, USA. July 1, 2000 – July 30, 2003.

Publications (last 6 years, more in full CV)

H. Beaufrèrea, R. Cruz, D.A. Smith, W.M. Taylor. Magnetic resonance imaging of a case of spinal cord trauma in a domestic rabbit. *Pratique médicale et chirurgicale de l'animal de compagnie* (2009)

K. Singh, TC Holbrock, LL Guillian, RJ Cruz, j Duffy, AW Confer. Severe Pulmonary Disease due to Multisystemic Eosinophilic Epitheliotropic Disease in a Horse. *Vet Pathol* 43:2, 2006

Robert Cruz – Arambulo DVM, Robert Wrigley, BVSc, MS, Barbara Powers, DVM. Sonographic features of Histiocytic Neoplasms in the Canine Abdomen. *Veterinary Radiology and Ultrasound*, 2004.

Robert de Jesús Cruz DVM, Manuel Salvador Alvarado DVM, MS, Jorge Enrique Sandoval DVM. Ultrasonographic diagnosis of embryonic and fetal death in bitches. *Veterinaria Mexico (Vet Mex)* 34:2, 2003.

Robert De J. Cruz, DVM, Manuel S. Alvarado, DVM, MS, Jorge E. Sandoval, DVM, Eloina Vilchez, DVM. Prenatal sonographic diagnosis of fetal death and hydranencephaly in two Chihuahua fetuses. *Veterinary Radiology and Ultrasound*. 44:5 2003.

Robert Cruz – Arambulo DVM, Robert Wrigley, MS. Ultrasonography of the acute abdomen. *Clinical Techniques in Veterinary Practice*. 18:1, 2003.

Robert Cruz – Arambulo, DVM; Eric Monnet, DVM, PhD; Phillip Steyn, BVSc, MS; Suzanne Shelly, DVM; Hays Cheryl, R.T. (R). Positive contrast rhinography and intranasal sinography in a dog with a nasofacial sinus tract producing subcutaneous emphysema and pneumomediastinum. *Journal of the American Veterinary Medical Association*. 222:11, 2003

Cruz A. Robert, Tan Lucy, Callan Robert, Van Metre David, Park Richard. Urethral rupture and subsequent communication with the corpus spongiosum in a crossbred goat – sheep (What is your diagnosis?). *Journal of the American Veterinary Medical Association*. 222:9, 2003

For each of the specialty colleges listed below please list at least two Diplomates of these colleges who can be expected to regularly interact with radiology residents:

ACVIM

Shauna Blois, DVM, DVSc
Steven Kruth, DVM
Anthony Abrams-Ogg, DVM, DVSc
Paul Woods, DVM
Michael O'Grady (cardiology)
Lynn O'Sullivan (cardiology)

ACVS

Don Trout, DVM PhD
Judith Koenig, DVM, DVSc
Nicola Cribb, DVM, DVSc
Noel Moens, DVM
Tom Gibson, DVM
Brigitte Brisson, DVM, DVSc
Sarah Boston, DVM, DVSc

ACVP

Darren Wood, DVM, DVSc
Robert A. Foster, BVSc, PhD, MACVS
Margaret Stalker, DVM, PhD

If all of the training will not be accomplished on-site, please attach a copy of the affiliations agreement(s). Include the scope of the training and amount of time the resident will be away from the home institution.

VI. Facilities:

Briefly describe how the program meets the facility requirements.

1. Three small animal x-ray rooms
 - a. *Room 1*: Digital diagnostic radiology/fluoroscopy – GE Precision 500D
 - b. *Room 2*: General diagnostic radiology/fluoroscopy – Philips Duo Diagnost
 - c. *Room 3*: General diagnostic radiology – Summit Innovet Select radiographic unit
2. Computed Radiography
 - AGFA CR 30-X Plate reader
3. Large animal radiography:
 - a. General diagnostic radiography/fluoroscopy – Philips Super 100 CP radiographic and fluoroscopic unit

- b. Minxray-300 Inc. portable radiographic unit (high-frequency generator)
- c. Xi Scan 1000 mini C-arm radiographic and fluoroscopic unit
- d. GE AMX-4 mobile radiographic unit
- e. Eklin Digital Radiography
- 4. Ultrasound
 - a. ATL Ultrasound HDI 3000 –2D, M-mode, pulsed and color Doppler, 3-D imaging
 - b. GE Vivid 9 – cardiology units (2)
- 5. Nuclear Medicine
 - Technicare gamma camera model 438
 - camera is floor mounted with the Omega equistand
 - PC based nuclear medicine software (Mirage) for dynamic and static imaging
 - small animal isolation ward
 - designated large animal isolation stalls
- 6. Magnetic resonance imaging - GE Sigma Infinity Echospeed Plus with Excite 1.5 Tesla magnet
- 7. Computed Tomography
 - GE Lightspeed 4 slice scanner (currently on site, installation complete by January 2008)
 - AW 4.2 image processing workstation
- 8. Radiation Therapy
 - a. Colbalt 60 Theratron
 - b. Strontium 90 Beta probe

VII. Clinical resources:

Indicate the approximate number of patients seen annually by the home institution?
What is the annual imaging caseload? 7950

Indicate the approximate breakdown of the patient population according to species.

Small animals (canine, feline)	14,320
Large animals (equine and food animals)	1,285
Exotic animals	1,524

What is the approximate annual imaging caseload of the program in:

Small Animal Radiology: 10,635

Large Animal Radiology: 1,966
Abdominal Ultrasound: 1,182
Computed Tomography: 276
Nuclear Medicine: 73
Magnetic Resonance Imaging: 482
Other (specify): LA Ultrasound - 310

VIII. Training content:

<p>What percentage of imaging reports are typically available within 48 hours after the examination is conducted in typewritten or electronic form?</p> <p>90%</p>
<p>If your answer is less than 75% please explain how reports are generated and how long it takes for the report to be available for review in typewritten form.</p>
<p>Of the preliminary reports generated from the imaging caseload what percentage are initially produced by the resident?</p> <p>The resident generates all of the reports for the service areas that they are assigned to for that week (i.e. if they are on the ultrasound, CT, MRI service they will generate 100% of those reports but no radiology or nuclear medicine reports and visa versa when they are on the radiology and nuclear medicine service).</p>
<p>What percentage of resident reports are reviewed by the imaging faculty prior to finalization of the report?</p> <p>100%</p>
<p>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?</p> <p>75%</p>

Please complete the table below

	Approximate number of cases in the 30 months clinical experience
Small Animal Radiology:	10,000
Large Animal Radiology:	1,900
Abdominal Ultrasound:	1,700
Computed Tomography:	200
Nuclear Medicine:	130
Magnetic Resonance Imaging:	450
Elective (any of above)	
Required elective (specify):	
Total	14,180

Please indicate the course number and unit assignment residents are required to take to meet the educational objectives for formal instruction as outlined in the Essentials in the following:

Topic	Course number	Units
Radiobiology:	CLIN 6330 Advanced Principles of Diagnostic Imaging	Radiation safety Interactions of radiation and cells

The Physics of:

Diagnostic Radiology:	CLIN 6350 Advanced Radiology I	Production of x-rays Properties of x-rays Technique chart formation Film screen imaging Darkroom processes
-----------------------	--------------------------------	--

		CR and DR
Nuclear Medicine:	CLIN 6330 Advanced Principles of Diagnostic Imaging	Physics of nuclear medicine Quality control in nuclear medicine
Ultrasonography:	CLIN 6330 Advanced Principles of Diagnostic Imaging	Physics of ultrasound
CT:	CLIN 6370 Neuroimaging	CT physics CT imaging protocols
MRI:	CLIN 6370 Neuroimaging	MRI physics MRI imaging protocols
<p>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 attached sheets if necessary.</p>		

IX. Research Environment:

<p>Over the last 5 years, what is the average number of peer reviewed publications, on which the IMAGING faculty listed under Direction and Supervision in IV above, are included as authors?</p> <p>Average # = 25 papers/all persons/5 years</p>
<p>What is the number of publications/submissions expected of a resident completing the program?</p> <p>A minimum of one paper from the thesis and one case report</p>
<p>If this is an established program, what percentage of residents have made formal research presentations at the annual ACVR or equivalent national meeting?</p> <p>1 resident has completed the program and presented at ACVR in 2009.</p>
<p>Is an advanced degree a requirement of the training program?</p> <p>Yes</p>

X. Educational Environment:

How many lectures or scientific presentations are expected of each resident during the course of their training?

The resident is expected to give two presentations per year as part of the hospital grand rounds. In addition the resident is expected to present their research at the ACVR conference.

XI. Evaluation:

During the program how often is resident performance evaluated in writing?

The resident will have daily subjective evaluation when involved in film reading with the faculty. During the first year, formal written evaluations by the faculty will occur at 6 and 12 months. An annual written evaluation will occur at the end of each of the subsequent years. The radiology faculty will provide an analysis of the resident's abilities, capabilities, and productivity. The results of these evaluations will be discussed with the resident by the section chief, residency program director, and the resident's advisor.

Every six months during the first two years of the residency there will be mock written examinations based on the written exam objectives that are not covered in the formal courses. At the end of the second year of the residency there will be a summative examination of the core knowledge. Mock oral exams will occur on a bi-weekly basis throughout the residency program.

XII. Teaching File:

What is the nature and scope of the teaching file available to residents?

There is a film based teaching file that is cataloged by systems. A digital teaching file is also available containing approximately 300 imaging studies at present.

How is it maintained/updated?

The teaching file is updated based on interesting case material presented during imaging rounds.

XIII. Conferences:

On average how many Known Case Conferences are conducted annually?

A minimum of 12 Known Case conferences are conducted annually with the number and frequency increasing the final year of the program.

Weekly rounds with the pathology, oncology, surgery, medicine and cardiology services are available for the resident to participate in. Residents are required to attend the cardiology rounds and strongly encouraged to attend the other service rounds.

XIV. Literature resources:

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

The Ontario Veterinary College Library provides access to all the journals held by the Canadian Institute for Scientific and Technical Information (approximately 17,000 journals). A library of relevant textbooks and journal articles is also maintained in the radiology department.

XV. Appendix:

- (a) 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), check the appropriate box. Complete the table for residents finishing 4 years ago (Year 4), 3 years ago (Year 3), etc.

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

(b) Provide a clinical schedule for your resident(s). This schedule should provide a weekly or monthly outline of the resident's clinical responsibilities. This may be in the form of a master schedule or duty roster for your entire radiology section if desired.

Summary of Resident Time

Activity	% Total time	Year 1	Year 2	Year 3	Year 4
Clinical service		37 weeks	34 weeks	35 weeks	30 weeks
Research		13 weeks	12 weeks	15 weeks	14 weeks
Vacation		2 weeks	2 weeks	2 weeks	2 weeks
Comprehensive Exam Study time			4 weeks		
Qualifying Exam Study time					6 wks

Detailed Yearly Schedule

Residency Schedule

Month	Week #	Year 1	Year 2	Year 3	Year 4		
Mid July	44	R	O	O	U	R = radiology, NM US = ultrasound, CT, MRI O = Off	
	45	R	R	R	R		
	46	R	R	R	R		
	47	R	U	U	O		
	48	R	U	U	O		
	49	R	U	O	O		
	50	R	R	O	O		
	51	R	R	R	O		
	52	R	R	R	O		
	Sept	1	R	U	U		O
		2	R	U	U		O
		3	R	O	O		R
4		R	O	O	R		
5		O	R	R	U		
6		O	R	R	U		
7		O	U	U	O		
8		O	U	U	O		
9		R	O	O	R		
10		R	O	O	R		
11		R	R	R	U		
12		R	R	R	U		

	13	O	U	U	O		
	14	O	U	U	O		
	15	R	O	O	R		
Jan	16	R	O	O	R		
	17	U	R	R	U		
	18	U	R	R	U		
	19	O	U	U	O		
	20	O	U	U	O		
	21	R	O	O	R		
	22	R	O	O	R		
	23	U	R	R	U		
	24	U	R	R	U		
	25	O	U	U	O		
	26	O	U	U	O		
	27	R	O	O	R		
	28	R	O	O	R		
	29	U	R	R	U		
	30	U	R	R	U		
	31	O	U	U	O		
	32	O	U	U	O		
	33	R	O	O	R		
May	34	R	O	O	R		
	35	U	R	R	O		
	36	U	R	R	O		
	37	O	U	U	O		
	38	O	U	U	O		
	39	R	O	O	R		
	40	R	O	O	R		
	41	U	O	R	U		
	42	U	O	R	U		
End of year	43	O	O	U	R		
	Rad	27	17	18	17	Total	79
	US	10	17	17	13		57
	Off	15	18	17	22		72