

CVM 6668
Small Animal Radiology Clinical Rotation

Coordinator

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Description

The intent of this rotation is to provide the student with instruction for making high quality radiographs, opportunity to practice routine special procedures, and principles for radiographic interpretation. The student will use knowledge gained in didactic coursework to refine their interpretive skills. The major emphasis for this rotation is small animal diagnostic radiology; however, students have the opportunity to gain exposure to CT and MRI. In daily topic rounds, concepts of radiographic interpretation in small animal species will be emphasized. Issues related to radiation protection will also be reviewed. A high case load ensures that students will gain a significant understanding of radiographic interpretation in small animal species. It is strongly encouraged and expected that students will review pertinent radiology notes in preparation for rounds and daily interpretation.

Prerequisites

CVM 6903, 6908, 6935, and 6947 or equivalent/instructor consent; completion of on-line radiation safety training modules through the Department of Environmental Health and Safety at the University of Minnesota

Books and Supplies

- U of MN Radiology lecture notes
- Burk RL and Feeney DA. *Small Animal Diagnostic Radiology and Ultrasonography: A Diagnostic Atlas and Text*, 3rd ed., Saunders, Philadelphia, 2003.
- Lavin L. *Radiography in Veterinary Technology*, 3rd ed., Saunders, Philadelphia, 2002.
- Thrall DE. *Textbook of Veterinary Diagnostic Radiology*, 6th ed., Elsevier Saunders, St. Louis, 2013.

Access to Course Materials

- Radiology educational web site: <http://www.cvm.umn.edu/vetrad>
- UM, VMC Carestream Health PACS Client: <http://umvetim.cvm.umn.edu>
- UM, VMC Carestream Health PACS Portal: <https://umvetim.cvm.umn.edu/Portal>
- Moodle: <https://moodle.umn.edu>

Goals and Objectives – Knowledge

The intent of this rotation is to provide the student with instruction for making high quality radiographs, opportunity to practice routine special procedures, and principles for radiographic interpretation. The student will spend approximately 50% of the rotation refining interpretation skills during daily topic rounds and reading with the radiologist. The student will spend approximately 50% of the rotation gaining technical skills in radiology. The student will use knowledge gained in didactic coursework to refine their interpretive skills. The major emphasis for this rotation is small animal diagnostic radiology; however, students have the opportunity to gain exposure to CT and MRI. If the student has other interests, they may discuss this with the rotation coordinator.

Specific goals:

By the end of the rotation, the student will:

- Recognize and describe normal radiographic anatomy of the thorax, abdomen, and appendicular/axial skeleton
- Recognize and describe abnormal radiographic findings in the thorax, abdomen, and appendicular/axial skeleton
- Apply pathophysiology as it pertains to radiographic abnormalities

Goals and Objectives – Skills and Abilities

By the end of the rotation, the student will:

- Demonstrate technical competency of obtaining diagnostic quality radiographs:
 - 1) Basic use and operation of diagnostic x-ray equipment
 - 2) Basic understanding of computed radiography
 - 3) Utilization of radiographic factors to obtain diagnostic radiographs
 - 4) Essentials of, and evaluation of, radiographic quality
 - 5) Recognition and correction of radiographic artifacts
 - 6) Radiographic positioning of routine anatomic regions
- Apply radiation safety measures
- Evaluate and interpret radiographs in the topic areas of cardiac and non-cardiac thorax, abdomen, GI, musculoskeletal, neuroradiology and contrast procedures
- Effectively communicate radiographic findings in writing and verbally
- Generate appropriate differential lists for radiographic abnormalities in light of the clinical presentation
- Appropriately manage case in light of radiographic findings to include follow-up diagnostics and therapy
- Integrate history, signalment, imaging, diagnosis and pathophysiology of case
- Understand role of imaging in case management – strengths and weaknesses

Attendance Policy

Students are expected to be present for all days of the rotation. One excused absence (for example, illness, family emergency, interview day or NAVLE exam) per rotation may be allowed. A University holiday occurring during a rotation is considered an excused absence, as students are not required to be in the hospital. The student must make arrangements for an excused absence with the Rotation Coordinator prior to the absence (unless an emergency) and must bring appropriate paper work. In the case of an

emergency, the student is expected to contact the Rotation Coordinator or Medical Imaging staff as soon as possible. In the case of more than one day's absence, regardless of whether it was excused, an incomplete (I) grade will be assigned. A grade of incomplete must be made up in accordance with established University policy. In the situation of an absence of two total rotation days, the student will be required to make up one day, participating in the duties which were missed on that day. In the case of an absence of three days or more, the student will be required to repeat the entire rotation. Only one student may be excused per day.

Assignment Policy

Assignment:	Due Date:
Technical quiz	12:00 pm second Wednesday of rotation
Core Unknown cases	9:00 am second Friday of rotation

- 1) Technical quiz: The technical quiz can be found on Moodle (please refer to the web site address listed above). The student must work alone but may use any reference material available to them for completion of the quiz. The technical quiz should be submitted no later than 12:00 pm on the second Wednesday of the rotation. The technical quiz will be reviewed as a group at 8:00 am on the last Friday of the rotation.

- 2) Core Unknown cases: There are ten core unknown cases for assessment of student knowledge and application. Students may work on these cases as a group or individually, using any reference material available, except for finding relevant medical record information pertaining to the exact unknown case. Each student must complete and turn in his/her own computer document report demonstrating individual work. The assignment is due on the second Friday of the rotation at the beginning of morning rounds, when the cases will be reviewed. Please bring in a printed document and give to the radiologist attending the rounds. The core unknown cases are accessed on the Carestream Health PACS Client OR Portal:
 - a. username: radstudent1
 - b. password: penumbra

- 3) Radiographic views and technical assessment: Students should spend the first week of the rotation observing and learning radiographic technique. During the second week of the rotation, the student should have enough experience and knowledge to perform studies on his/her own under the direct guidance of the radiology technicians. Students should have the specific goal of observing and performing the following specific radiology tasks such that they can train someone else to perform them:
 - a. Thorax: right lateral, left lateral and ventrodorsal views
 - b. Abdomen: lateral and ventrodorsal views
 - c. Spine: lateral and ventrodorsal views
 - d. Forelimb: lateral and cranio-caudal or caudo-cranial views
 - e. Hindlimb: lateral and cranio-caudal or caudo-cranial views
 - f. Pelvis: lateral and ventrodorsal views

Participation Policy

Daily Schedule (subject to change):

8:30-10:00am	Radiology topic rounds
10:00am-12:30pm/1:00pm	Clinical radiology cases with technicians and radiologist
12:00/12:30-12:30/1:00pm	Lunch (may be less time depending upon the day)
12:30/1:00-5:00pm (or until clinical procedures are completed)	Clinical radiology cases with technicians and radiologist

*Students are expected to attend VCS Grand Rounds on Thursdays from 8:00-9:00 am. Radiology rounds will begin at 9:00 am. When there is no Grand Rounds presentation, rounds will begin at 8:30 am.

** Technical quiz review will occur at 8:00 am on the last Friday of the rotation

Daily Topic Rounds Schedule:

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Orientation	Cardiac	Non-cardiac thorax	Abdomen – non-GI	GI
Week 2	Thoracic limb	Pelvic limb	Skull/spine	Special Procedures	Case unknowns

Students are expected to be on time for, and actively participate in, daily topic radiology rounds. To this end, it is expected that students review the material presented in didactic lectures. Radiology rounds encompass the entire case, and it is expected that the student will be able to discuss disease pathophysiology, follow-up diagnostics, disease treatment and follow-up and potential outcomes of the case using the knowledge gained over the past three didactic years of course work. Similar discussions will occur when the student is reading with the on-duty radiologist and/or radiology resident.

Students will be assigned daily duties on a rotation schedule displayed in radiology and are expected to participate actively in these duties. Specific duties will include reading with the radiologist, making radiographic studies, and performing special procedures. Many of these duties will be under the guidance of the radiology technicians. It is expected that the student will show enthusiasm, motivation, and appropriate independence as they participate in these tasks.

While managing a radiographic case, students are responsible for the welfare of the patient and should be cognizant of the patient status and vital signs. It would be helpful to have a stethoscope. Students will often be obtaining patients from owners, and it is expected that students will be dressed in clean respectable clothing in accordance with the hospital dress policy.

Criteria for Evaluation

Each student will be graded using the attached grading form. The student will be graded by each faculty member, radiology resident and technician working during that rotation. The student will be evaluated in three areas of competency: knowledge, clinical skills and professionalism. These three areas will be equally weighted in order to obtain a final overall grade. The student must successfully pass all three areas in order to receive a passing overall grade. Within each area are several categories, some of which are graded by the faculty/resident, some of which are graded by the technicians, and some of which are graded by both faculty/resident and technicians. Scores from each individual completing the evaluations will be averaged to obtain a score for each category. Each category may not have equal weighting. Please see the grading form for the weighting of each category and for the expectations of an excellent score. A grade of “F” in any category will result in a final grade of “F” in that area of competency. For example, if a student receives a grade of “F” in the category of work ethic and dependability, the student will receive a grade of “F” in the competency area of professionalism. A grade of “F” in any area of competency will result in an overall rotation grade of “F”.

Evaluation

Rotation instructor and course evaluations will be distributed electronically by the Office of Academic and Student Affairs. Results and comments are collated and analyzed automatically and anonymously before being distributed to the instructor. The evaluations are utilized by the instructors to improve the rotation and for annual merit review.

University Policies

All CVM students are expected to follow the *CVM Honor Code*, available at http://www.cvm.umn.edu/education/prod/groups/cvm/@pub/@cvm/@migrate/document/s/asset/cvm_51869.pdf.

In addition, the *University Student Conduct Code* is available at <http://www1.umn.edu/regents/policies/academic/Conduct.pdf>

The *CVM Attendance Policy* is available at <http://www.cvm.umn.edu/education/currentstudents/policies/attendance/home.html>

The *CVM Exam Policy* is available at <http://www.cvm.umn.edu/education/currentstudents/policies/Exam/home.html>

The University of Minnesota is committed to providing all students equal access to learning opportunities. Disability Services (DS) is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations.

- Students who have, or think they may have, a disability (e.g. mental health, attentional, learning, vision, hearing, physical or systemic), are invited to contact DS to arrange a confidential discussion at 612-626-1333 (V/TTY) or ds@umn.edu.

- Students registered with DS, who have a letter requesting accommodations, are encouraged to contact the instructor early in the semester to discuss accommodations outlined in their letter.

Additional information is available at the DS website <http://ds.umn.edu>.

University policy prohibits sexual harassment as defined in the University Policy Statement (<http://www1.umn.edu/regents/policies/humanresources/SexHarassment.html>) adopted on December 11, 1998. Complaints about sexual harassment should be reported to the University Office of Equal Opportunity, 419 Morrill.

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via: <http://www.mentalhealth.umn.edu/>

Information about *Academic Civility Resources* is available at <http://www.sos.umn.edu/staffaculty/>

**University of Minnesota – College of Veterinary Medicine
Clinical Rotation Evaluation Guide – Radiology**

Student: _____

Rotation: _____

Rotation Dates: _____ Rotation # _____

Clinicians: _____

- A = Outstanding. Denotes a remarkable individual who stands out from the usual student. Excellent knowledge base; takes an active role in the rounds; demonstrates knowledge through full participation; excellent ability to integrate and apply the knowledge; mature, compassionate, dedicated, skillful, committed, and excellent teamwork; and exceeds timely performance of tasks.
- B = Good to very good. The majority of DVM students will achieve at this level. Good to very good grasp of the information; solid ability to organize information, integrate, and make sound decisions; good ability to handle stress; compassionate and skillful patient care; and consistent timely performance of tasks
- C = Competent. Acceptable performance; knowledge has gaps; organizational skills are adequate, and shows acceptable ability to work through a problem, integrate, and apply knowledge; some challenges handling stress and with human interaction; displays competent patient care
- D = Deficient. Knowledge has moderate gaps which may compromise patient care; somewhat disorganized, indecisive, confused, and disjointed; marginal ability to handle stress; somewhat immature, and has difficulty with human interaction; and may miss deadlines
- F = Failing. Knowledge has significant gaps, greatly compromising patient care; very disorganized, indecisive, confused, and disjointed showing great difficulty working through obvious issues; exhibits serious problems in human interactions and ability to deliver patient care; and consistently misses deadlines

Name: _____

Rotation: _____

1. Knowledge: Knows how and willingness to show how. All categories scored by DVMs

	A	B	C	D	F
	Excellent	Good	Competent	Deficient	Failing
Sources of Knowledge Data Gathering/Acquisition – Core Unknown cases 40% weight of this section scored by DVM	<p>Completely lists radiographic findings using Roentgen sign analysis for the core unknowns using appropriate terminology and anatomy</p> <p>Includes appropriately ranked differentials for the radiographic findings in light of the case presentation</p> <p>The score from the core unknowns will be translated into a score for this section. The score out of 30 points will be factored to a score out of 25 points.</p>			<p>Incompletely lists radiographic findings or lists incorrect radiographic findings; does not use Roentgen sign analysis; uses inappropriate terminology and anatomy in descriptions</p> <p>Includes inappropriate differentials for the radiographic findings in light of the case presentation</p>	
Basic Knowledge 15% weight of this section scored by DVM	<p>Excels at demonstrating technical knowledge specific to the rotation and the application of clinical skills.</p> <p>Has a strong understanding of what he/she knows and does not know.</p> <p>Shows exceptional logic and knowledge in written interpretations and histories, case reports, discussion with faculty, and links observations from assessments to plans/discharge notes.</p>			<p>Fails to demonstrate technical knowledge specific to the rotation and the application of clinical skills.</p> <p>Has a basic understanding of what he/she knows and does not know.</p> <p>Presents only limited logic and knowledge in written interpretations and histories, case reports, discussion with faculty, and links observations from assessments to plans/discharge notes.</p>	
Species Knowledge 15% weight of this section scored by DVM	<p>Demonstrates complete knowledge of species-specific information of species encountered in rotation (e.g. normal anatomy, anatomic differences, physiologic differences, disease spectrum difference, etc.)</p>			<p>Lacks knowledge of species-specific information of species encountered in rotation (e.g. normal anatomy, anatomic differences, physiologic differences, disease spectrum difference,, etc.).</p>	
Disease Processes 15% weight of this section scored by DVM	<p>Demonstrates complete knowledge of pathophysiology, etiology, epidemiology, immune response, etc. of diseases encountered in rotation.</p>			<p>Lacks knowledge of pathophysiology, etiology, epidemiology, immune response, etc. of diseases encountered in rotation.</p>	
Rotation-Specific Material 15% weight of this section scored by DVM	<p>Demonstrates mastery of rotation-specific material (e.g., approach to interpretation of radiographs).</p>			<p>Demonstrates limited knowledge of rotation-specific material (e.g., approach to interpretation of radiographs).</p>	

Name: _____

Rotation: _____

2. Clinical Skills: Applying the know-how in a practical setting: Some categories scored by DVMs and some scored by technicians

	A	B	C	D	F
	Excellent	Good	Competent	Deficient	Failing
<p>Clinical Decision Making (includes assessment of information) 20% weight of this section Scored by DVM</p>	<p>Displays outstanding ability at integrating relevant information to make sound clinical judgments. (e.g. information from Hx, PE, lab data, imaging data, , etc.)</p> <p>Shows excellent ability at integrating complicated information from a wide variety of sources to arrive at optimal problem solutions, in accordance with POMR (problem oriented medical record)</p> <p>Takes economic considerations (e.g., cost implications of decisions, making wise choices that make sense in terms of treatment and cost) at a level appropriate for a senior student.</p>			<p>Fails to integrate important clinical information, resulting in poor clinical judgment (e.g. Hx, PE, lab data, imaging data, etc.)</p> <p>Fails to take into account all relevant information from a limited or narrow range of sources, leading to poor understanding of the patient’s problems.</p> <p>Fails to take economic considerations (e.g., cost implications of decisions, making wise choices that make sense in terms of treatment and cost) when making decisions.</p>	
<p>Diagnostic Plan 15% weight of this section Scored by DVM</p>	<p>Devises excellent diagnostic plans based on a strong knowledge base.</p> <p>Provides superior explanation and rationale for the diagnostic plan; explains the diagnostic plan in the context of a specific patient.</p>			<p>Devises inadequate or incomplete diagnostic plans.</p> <p>Fails to provide clear explanation and rationale for the diagnostic plan; does not explain the diagnostic plan in the context of a specific patient.</p>	
<p>Treatment Plan 15% weight of this section Scored by DVM</p>	<p>Devises complete and accurate treatment plan.</p>			<p>Devises inappropriate or incomplete treatment plans.</p>	

Name: _____

Rotation: _____

Clinical Skills: Applying the know-how in a practical setting (continued)

	A	B	C	D	F
	Excellent	Good	Competent	Deficient	Failing
Organization of Information 20% weight of this section Scored by DVM	Demonstrates ability to formulate a logical prioritized list of differential diagnoses based upon a given set of imaging findings.			Is unable to formulate a logical prioritized list of differential diagnoses based upon a given set of imaging findings	
Procedures 10% weight of this section Scored by tech	Demonstrates superior technical skills and is thorough and efficient in animal handling and radiographic positioning. Is adept at basic procedures (e.g., drawing blood, inserting catheters, tissue handling, use of basic instruments, use of aseptic techniques, etc.),			Demonstrates limited basic technical skills and is incomplete and inefficient in animal handling and radiographic positioning. Is not adept at, basic procedures (e.g., drawing blood, inserting catheters, tissue handling, use of basic instruments, use of aseptic techniques, etc.	
Patient Care and Welfare 10% weight of this section Scored by tech	Provides excellent patient/client care. Pays vigilant attention to details, such as patient's comfort and nutrition. Ensures that treatments are done in a timely and accurate fashion. Readily recognizes changes in patient's condition and communicates changes to supervising clinicians.			Provides substandard patient/client care. Does not consistently look after patient's comfort. Does not consider patient's nutritional care. Inconsistently administers treatments or provides inadequate treatment. Fails to recognize and report important changes in patient's condition to supervising clinicians.	
Technical Test 10% weight of this section Scored by tech	The score from the technical test will be translated into a score for this section. A=27-30, B=24-26, C=21-25, D=18-20, F=<18				

Name: _____

Rotation: _____

3. **Professionalism:** *Work habits, interpersonal maturity and skills, teamwork, commitment, initiative:* all categories are equally weighted (12.5% each); some categories scored by DVMs, some scored by technicians, and some scored by both

	A	B	C	D	F
	Excellent	Good	Competent	Deficient	Failing
<p>Attendance and Punctuality</p> <p>12.5% weight of this section</p> <p>Scored by DVM</p>	<p>Is always present and on time (with the possible exception of a true, documented emergency). Always performs tasks in a timely fashion and meets deadlines.</p>			<p>Does not meet attendance guidelines on syllabus. Has more than the allowed number of absences for the rotation. Consistently comes late to sessions. Consistently misses deadlines.</p>	
<p>Acceptance of Responsibility</p> <p>12.5% weight of this section</p> <p>Scored by tech</p>	<p>Willingly takes responsibility and ownership for own action and their consequences (e.g., seeks feedback, willingly admits mistakes).</p> <p>Proactively follows up and follows through on case (pending data, response to treatment, etc.)</p>			<p>Avoids responsibility for own actions and their consequences (e.g., deflects blame, does not admit mistakes, resists feedback).</p> <p>Fails to proactively follows up and follows through on case (pending data, response to treatment, etc.)</p>	
<p>Enthusiasm and Attitude Toward Work</p> <p>12.5% weight of this section</p> <p>Scored by DVM and tech</p>	<p>Conveys an exceptional “can-do” spirit, a sense of optimism, ownership, and commitment and dedication.</p>			<p>Demonstrates a consistent sense of pessimism and/or lack of ownership, commitment dedication.</p>	

Name: _____

Rotation: _____

<p>Personal Appearance</p> <p>12.5% weight of this section</p> <p>Scored by DVM</p>	<p>Always dresses in a professional manner. Adheres to dress code. Exhibits excellent personal hygiene.</p>		<p>Tends to be consistently casual in attire. Does not adhere to dress code. May have hygiene issues.</p>
<p>Work Ethic and Dependability</p> <p>12.5% weight of this section</p> <p>Scored by DVM and tech</p>	<p>Exceeds commitments made to others (e.g., doctors, staff, clients).</p>		<p>Frequently commits to things without following through, causing trust to be questioned.</p>
<p>Care of Equipment and Room</p> <p>12.5% weight of this section</p> <p>Scored by tech</p>	<p>Always readily assumes responsibility for equipment care and cleanliness. Cleans up after self.</p>		<p>Consistently fails to assume responsibility for equipment care and cleanliness. Does not clean up after self.</p>
<p>Follow Instructions</p> <p>12.5% weight of this section</p> <p>Scored by tech</p>	<p>Always actively participates and asks questions to clarify assignments/priorities and carries out task as expected.</p>		<p>Puts limited effort into asking questions to clarify assignments/priorities and/or consistently deviates from the instructions.</p>

Name: _____

Rotation: _____

<p>Verbal Communication</p> <p>12.5% weight of this section</p> <p>Scored by DVM and tech</p>	<p>Displays excellent communication skills with clients, peers, faculty, and staff, including the ability to initiate communication, gather information, build relationships, give information, and close communication. Takes great care to demonstrate/communicate empathy and compassion.</p>		<p>Displays substandard communication skills with clients, peers, faculty, and staff. Has trouble initiating communication, gathering information, building relationships, giving information, or closing communication. Consistently deficient in demonstrating/communicating empathy and compassion.</p>
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Name: _____

Rotation: _____

Check appropriate box for each competency	Overview of Performance:
	Key strengths:
	Key Development Opportunities:
KNOWLEDGE	
A B C D F	
CLINICAL SKILLS	
A B C D F	
PROFESSIONALISM	
A B C D F	
Overall Grade <input type="checkbox"/>	