

CVM 6651
Small Animal Ultrasound Clinical Rotation

Coordinator

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Description

The intent of this rotation is to provide the student with instruction for the use of ultrasound in small animal veterinary medicine, opportunity to practice routine abdominal ultrasound, and principles for interpretation of ultrasound examination. The student will use knowledge gained in didactic coursework to refine their interpretive skills. The emphasis of the rotation will be learning through the use of the clinical caseload; however, there will be dedicated daily time allotted for practice of particular ultrasound skills. Students will have the opportunity to perform scanning of clinical patients as time and patient tolerance permits. Students may bring their own pets for scanning models as well. Students will be expected to interpret radiographic procedures as needed for guidance in ultrasound examination. It is strongly encouraged and expected that students will review pertinent ultrasound course notes in preparation.

Prerequisites

CVM 6903, 6908, 6935, and 6947 or equivalent/instructor consent; successful completion of CVM 6105 Small Animal Ultrasonography with achievement of 70% on the final exam

Books and Supplies

- CVM 6105 Small Animal Ultrasonography notes
- Burk RL and Feeney DA. *Small Animal Diagnostic Radiology and Ultrasonography: A Diagnostic Atlas and Text*, 3rd ed., Saunders, Philadelphia, 2003.
- Nyland TG and Mattoon JS. *Small Animal Diagnostic Ultrasound*, 2nd ed., Saunders, Philadelphia, 2002.
- Penninck D and d'Anjou MA. *Atlas of Small Animal Ultrasonography*, Blackwell Publishing, Ames, Iowa, 2008.

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 the use of ultrasound in small animal veterinary medicine, opportunity to practice routine abdominal ultrasound, and principles for interpretation of ultrasound examination. The student will use knowledge gained in didactic coursework to refine their interpretive skills. The emphasis of the rotation will be learning through the use of clinical caseload; however, there will be dedicated daily time allotted for practice of particular ultrasound skills.

Specific goals:

By the end of the rotation, the student will:

- Recognize and describe the normal sonographic anatomy of abdominal structures
- Recognize and describe abnormal sonographic findings of abdominal structures
- Apply pathophysiology as it pertains to sonographic abnormalities

Goals and Objectives – Skills and Abilities

By the end of the rotation, the student will:

- Demonstrate basic use and operation of ultrasound equipment
- Optimize ultrasound image to obtain a diagnostic study
- Recognize and understand ultrasonographic artifacts
- Demonstrate basics of ultrasound examination of routine anatomic areas to include liver, spleen, kidney, bladder, great vessels, lymph nodes, GI, pancreas and adrenal glands
- Effectively communicate sonographic findings verbally
- Generate appropriate differential lists for sonographic abnormalities in light of the clinical presentation
- Appropriately manage case in light of ultrasonographic 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

Daily learning objectives for the technical training:

- 1) Knobology: after explanation of the ultrasound keyboard, the student should be able to demonstrate appropriate equipment settings on a patient
- 2) Approach to abdomen: the student should be able to explain/demonstrate
 - a. Appropriate abdominal preparation
 - b. A systematic approach to an exam
 - c. Appropriate transducer choice and handling
 - d. Appropriate image orientation
 - e. Appropriate equipment settings
- 3) Liver/spleen: The student should be able to obtain the standard images of the liver and spleen. The student should be able to demonstrate finding the following:
 - a. Gall bladder
 - b. Cava/portal vein/portahepatis
 - c. Area of common bile duct
 - d. Spleen hilus

- 4) Kidney: The student should be able to obtain the standard images of the kidneys. The student should be able to demonstrate finding the following:
 - a. Left kidney
 - b. Right kidney
 - c. Cortex, medulla, junction
 - d. Renal hilus/pelvis
 - e. Renal vessels
 - f. Echogenicity comparison
- 5) Bladder/great vessels/lymph nodes: The student should be able to demonstrate finding the following:
 - a. Bladder trigone/neck
 - b. Proximal urethra/prostate
 - c. Bladder wall thickness
 - d. Terminal aorta and cava
 - e. Medial iliac lymph nodes
- 6) Ultrasound-guided sampling: The student should be able to demonstrate the following:
 - a. FNA with and without guide
 - b. Core biopsy with and without guide
- 7) GI/pancreas: The student should be able to demonstrate finding the following:
 - a. Stomach/pylorus
 - b. Duodenum
 - c. Jejunum
 - d. Ileum
 - e. Colon
 - f. Wall layering and thickness
 - g. Area of pancreas
- 8) Adrenal glands: The student should be able to demonstrate finding the following:
 - a. Left adrenal gland
 - b. Right adrenal gland
 - c. Vascular landmarks
 - d. Adrenal measurements

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 the ultrasound technicians 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

Two sets of unknown cases in power point presentation are available on the Moodle site. Students are expected to review these unknown cases. Review can be individual and/or as a group. For each case, be sure to write the answers to the questions on the slides (1. What are your findings? 2. What is your diagnosis/differential diagnosis? and 3. What do you recommend?). The intent is that the first set of cases should be reviewed during the first week, and the second set of cases should be reviewed during the second week. Your notes will be the basis for the group review/discussion of these cases with the instructor. You are not graded on your notes, but your participation and discussion regarding the cases in the group discussion will be part of the assessment of your performance on the rotation. A time for the group review/discussion will be set aside dependent upon the caseload. If possible, the first set of cases will be discussed the first week and the second set of cases will be discussed the second week; however, both sets of cases may be discussed during the second week of the rotation.

Participation Policy

Daily Schedule (subject to change):

8:15-9:00 am	Technical training with ultrasound technicians
9:00 am-12:30pm	Clinical ultrasound cases with technicians and radiologist
12:30-1:00 pm	Lunch (may be less time depending upon the day)
1:00-5:00 pm (or until clinical procedures are completed)	Clinical ultrasound cases with technicians and radiologist

Daily Technical Training Schedule (subject to change):

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Orientation, knobology, approach to abdomen	Liver/spleen	Kidney	VCS Grand Rounds	Bladder/great vessels/LNN
Week 2	GI	Sampling	Pancreas	VCS Grand Rounds	Adrenal glands

Students are expected to be on time for, and actively participate in, daily ultrasound technical training. To this end, it is expected that students review the material that was presented in the ultrasound lectures.

Students are expected to actively participate in the daily clinical ultrasound cases. Discussion of an ultrasound case will encompass the entire case, and it is expected that the student will be able to discuss disease pathophysiology, further 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. **One student will take responsibility for each clinical ultrasound case.** The responsible student will present the case history, ultrasound findings, differentials, and any further diagnostic plan to the radiologist prior to the scan.

In general, the day begins at 8:15 am and ends at 5:00 pm; however, students will remain until the daily work has been completed. Students will be allotted time for lunch, which, depending upon the caseload, will be 30-60 minutes. While managing an ultrasound case, the student is responsible for the welfare of the patient and should be cognizant of the patient's status and vital signs. It would be helpful to have a stethoscope. Students may 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.

It is expected that the student will be motivated to be part of the clinical case and discussion with the technicians and radiologists. It is also expected that the students will care for the equipment and room, including cleaning up when needed. Students are encouraged to practice scanning techniques on personal pets during down time.

Other assignments (for example, unknown cases) may be given during the rotation and students are expected to complete these.

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 – US**

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

1. Knowledge: *Knows how and willingness to show how.* all categories equally weighted (20%); all categories scored by DVMs

	A	B	C	D	F
	Excellent	Good	Competent	Deficient	Failing
<p>Sources of Knowledge Data Gathering/Acquisition</p> <p>20% weight of this section scored by DVM</p>	<p>Exceptional at knowing where to look for sources to obtain knowledge and uses that knowledge with savvy.</p> <p>Actively gathers specific and relevant information from a variety of sources (e.g., historical, physical and laboratory information; lecture notes, references) to fully understand the problem.</p>			<p>Is often confused about where to look for sources to obtain knowledge and may not know how to use that knowledge in an astute manner.</p> <p>Seeks limited additional information to better understand problems; jumps to conclusions when gathering additional information is appropriate.</p>	
<p>Basic Knowledge</p> <p>20% weight of this section scored by DVM</p>	<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>	
<p>Species Knowledge</p> <p>20% weight of this section scored by DVM</p>	<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>	
<p>Disease Processes</p> <p>20% weight of this section scored by DVM</p>	<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>	
<p>Rotation-Specific Material</p> <p>20% weight of this section scored by DVM</p>	<p>Demonstrates mastery of rotation-specific material (e.g., approach to interpretation of imaging studies, including radiographs and ultrasound).</p>			<p>Demonstrates limited knowledge of rotation-specific material (e.g., approach to interpretation of imaging studies, including radiographs and ultrasound).</p>	
<p>Other (Please Describe)</p>					

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

	A Excellent	B Good	C Competent	D Deficient	F Failing
<p>Clinical Decision Making (includes assessment of information) 20% weight of this section</p> <p>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 judgement (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</p> <p>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</p> <p>Scored by DVM</p>	<p>Devises complete and accurate treatment plan.</p>			<p>Devises inappropriate or incomplete treatment plans.</p>	

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

	A	B	C	D	F
	Excellent	Good	Competent	Deficient	Failing
<p>Organization of Information</p> <p>20% weight of this section</p> <p>Scored by DVM</p>	<p>Demonstrates ability to formulate a logical prioritized list of differential diagnoses based upon a given set of imaging findings.</p>			<p>Is unable to formulate a logical prioritized list of differential diagnoses based upon a given set of imaging findings</p>	
<p>Procedures</p> <p>20% weight of this section</p> <p>Scored by tech</p>	<p>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.),</p>			<p>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.</p>	
<p>Patient Care and Welfare</p> <p>10% weight of this section</p> <p>Scored by tech</p>	<p>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.</p>			<p>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.</p>	
<p>Other (please describe)</p>					

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>	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.			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>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>	Conveys an exceptional “can-do” spirit, a sense of optimism, ownership, and commitment and dedication.			Demonstrates a consistent sense of pessimism and/or lack of ownership, commitment dedication.	
<p>Personal Appearance</p> <p>12.5% weight of this section</p> <p>Scored by DVM</p>	Always dresses in a professional manner. Adheres to dress code. Exhibits excellent personal hygiene.			Tends to be consistently casual in attire. Does not adhere to dress code. May have hygiene issues.	

<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>
<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>
<p>Other (please describe)</p>			

<p>Check appropriate box for each competency</p>	<p>Overview of Performance:</p>					
<p>KNOWLEDGE</p>	<p>Key strengths:</p>					
<table border="1"> <tr> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>F</td> </tr> </table>	A	B	C	D	F	<p>Key Development Opportunities:</p>
A	B	C	D	F		
<p>CLINICAL SKILLS</p>						
<table border="1"> <tr> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>F</td> </tr> </table>	A	B	C	D	F	
A	B	C	D	F		
<p>PROFESSIONALISM</p>						
<p>Overall Grade <input type="checkbox"/></p>						