



COLLEGE OF
VETERINARY MEDICINE

College of Veterinary Medicine Policies and Procedures

Subject: **Scheduling**

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SCHEDULING

Scheduling for all imaging examinations will be performed in such a way so as to expedite service commitments. Examinations will be prioritized according to the time submitted and their triage priority.

1. Priority for radiographic examinations
 - a. Emergencies
 - b. Anesthetized animals
 - c. Outpatients
 - d. Inpatients
 - e. Research animals

Within each group, priority is established according to the order in which requests were submitted. Only emergency procedures and post-operative studies will be performed after 5:00 PM, on weekends and on holidays.

2. Exceptions to the scheduling protocol should be cleared through the senior technologist and/or radiologist on duty.
3. Anesthesia Cases:
 - a. Anesthesia cases with the potential for subsequent surgery should be scheduled as early in the day as possible
 - b. All requests requiring general anesthesia should be submitted at least one day in advance when possible.
4. Research Examinations:
 - a. Anesthetized research cases (all radiology-supported research) must be submitted at least 24 hours in advance for scheduling. Non-anesthetized research cases should be submitted 24 hours in advance to guarantee timely examination. Clinic patients take priority over research cases in nearly all instances.

b. Imaging prices must be discussed with the Service Chief or senior technologist prior to performing studies for research projects.

5. Special Procedures:

Special contrast examination requests must be approved by the radiologist on floor duty before a request is submitted. Pertinent clinical information must be included on the request form. The request must be submitted in advance with the on-duty radiologist's approval, and the animal must be adequately prepared prior to start of the study.

RADIATION SAFETY

1. Adherence to radiations safety practices is mandated by MSU-CVM polices, state law, and federal regulations. Radiation safety policies and procedures are not negotiable.
2. Anyone involved in the acquisition of images that utilize ionization radiation must be over the age of 18 and in possession of a dosimetry badge. Clients are not allowed to help with studies for any reason.
3. Faculty, house officers, students, and staff that restrain for radiographic studies must wear leaded aprons, gloves, and a thyroid shield, as well as a dosimetry badge at all times during image acquisition. This also applies to fluoroscopy studies.
4. Failure to comply with radiation safety practices results in termination of the study. If a radiation safety violation is committed after hours, the violation is turned over to the hospital director for disciplinary action. Multiple violations committed by the same attending intern or resident will result in the individual losing radiography privileges after hours.
5. If you are concerned about radiation safety practices interfering with your patient's study, please consult the radiology resident or faculty. We are happy to help troubleshoot any perceived problems.

RADIOLOGY EQUIPMENT

Please do not remove any equipment from radiology without permission from the technologist or radiology faculty. Example items include chairs, markers, muzzles, foam wedges, and troughs (also known as tacos). If protective equipment is needed for a procedure, please check the equipment out with one of the radiology technicians and please return it promptly after termination of the procedure.

IMAGING REQUESTS

1. An imaging request must be submitted for EVERY study, even on emergency. Requests are submitted through Electronic Medical Record (EMR). If the EMR request is incomplete, we will not receive it. Once a study is requested with complete information it will then be scheduled and put on the schedule. Charges are entered by our staff once they complete the examination. Please note that we are completely unable to enter a patient manually into the system if an order is not present in EMR; we do not have the capability to perform "emergency" imaging and assign it to the patient later.
2. Request forms must be filled in completely. This includes the complete date, clinician name(s), a concise and pertinent history, and whether the animal will be sedated or anesthetized. Please do not put disparaging information about the client or referring veterinarians in the history as it

automatically saves into the radiology report. If paperwork is not complete, the student or clinician on the case will be contacted before imaging is performed. The imaging request may also be canceled if it is incomplete.

3. Other important information to include in the history:
 - a. For limb radiographs, the laterality of the limb to be imaged. Failure to indicate this will result in cancellation of the study on our end.
 - b. Whether or not the animal will bite. If the animal is fractious, please bring a muzzle or sedation for the animal.
 - c. If you suspect a zoonotic disease such as leptospirosis
 - d. If the patient is currently receiving chemotherapy
 - e. Whether or not the animal needs oxygen.
 - f. For a pelvis—whether or not the animal can be “frog-legged”
 - g. Anything a person handling a patient should know
4. Extremities
Indicate which limb and which part of the limb on the request. Whole limb radiographs are not permitted.
5. A recheck study may be requested if the previous study was performed within the past 6 months.

IMAGE APPROVAL

1. It is not necessary for the clinician on a case to approve radiographs. Film approval is obtained from a radiology technologist, radiologist, or radiology resident.
2. If the clinician on the cases would like to be present at the end of the study, please indicate this on the request form.
3. Other than orienting the radiographs properly, postprocessing of the images (e.g. cropping, labeling, etc.) is to only be performed by radiology technicians, radiology residents, or radiologists. After hours, images should only be sent to PACS if requested by your supervising senior clinician or one of the radiology staff members.

RADIOGRAPHIC STUDIES

1. Thoracic radiographs
 - a. Met check study:
 - 1) What’s included? 3 views = right lateral, left lateral, and a VD.
 - 2) Two views are never permissible.
 - b. Pneumonia study:
 - 1) What’s included? 3 views = right lateral, left lateral, and a VD.
 - 2) Two views are never permissible.
 - c. Cardiac study, including heartworm disease:
 - 1) What’s included? views: right lateral, VD, and a DV.
 - 2) Two views are never permissible.
 - 3) Feel free to request a four-view study if other pulmonary pathology is suspected.

- 4) Radiographs are superior to echocardiography for determining if a patient is in congestive heart failure.
- d. Tube check:
 - 1) Purpose: to check the placement of feeding tubes, thoracostomy tubes, etc
 - 2) What's include? 2 views: right lateral and a VD or DV projection.
 - 3) A single projection is never permissible for a tube check.
 - e. Please note that a DV projection may be substituted for a VD projection if a patient is in respiratory stress or cannot tolerate dorsal recumbency.
2. Extremities, skull, and spine radiographs
 - a. Be specific about laterality. You may know on which limb the animal is lame, but we do not. Make sure left vs. right and front vs. hind are identified on the request.
 - b. A standard exam is two views for anything proximal to the carpus/tarsus
 - c. Four views (or more) are standard for anything from the carpus/tarsus and distal:
 - d. Many equine studies benefit from additional views such as flexed, skyline, or other obliques. Please talk to the radiologist or radiology resident if you have questions about additional views.
 - 1) Equine stifle studies include a lateral, a craniocaudal, and a caudolateral-craniomedial oblique.
 - 2) Equine fetlock and carpus studies include a lateral view, a flexed lateral view, a dorsopalmar/dorsoplantar view, and two oblique views.
 - 3) Distal phalanx studies include a lateral, DP, 45 degree DPO, 65 degree DPO, and a navicular skyline view.
 - 4) Two-view farrier studies of the distal phalanx should only be used for farrier work. This is an incomplete means to evaluate the distal phalanx and/or navicular bone.
 - e. Sedation is important for all orthopedic studies. These animals are tense and often painful which makes adequate positioning impossible.
 - 1) A student, technician, or doctor of the sedating service must be present at all times to monitor the sedated patient. A sedated patient should not be left unattended with the radiology service for any reason. Out of patient safety, unattended sedated patients will be returned to the respective service and the study completed at a later time.
 - 2) Please have your sedation ready so we can be as efficient as possible. However, do not sedate an animal without talking with radiology first. Ideally, bring the patient to the imaging suite when called by the radiology staff and sedate immediately prior to the study, or coordinate the administration of sedation ahead of time.
 - 3) Anesthesia or very heavy sedation is required for adequate films of the skull and spine. These studies, in an awake patient, create stress on the patient and staff, lead to lesser diagnostic quality films, and cause an increase in radiation dose to personnel and patient due to repeat exposures.
 - 4) Heavy sedation is required for all OFA pelvic studies.
 - 5) The requirement for sedation or anesthesia for skull, spine or extremity views may be waived in uncommon circumstances on a case-by-case basis, with prior approval of the radiology faculty or house officers.

- 6) If sedation is requested by radiology students or technicians, the study will be paused until sedation is provided. If for some reason sedation cannot be given to the patient, the attending clinician must approve this with the radiology house officer or radiologist on the floor.
3. Abdominal radiographs
 - a. All abdominal studies include three views: right lateral, left lateral, and a VD
 - b. A dorsoventral projection may be substituted for unstable or non-compliant patients.
 - c. For male patients with suspected urolithiasis, a perineal (aka "butt-shot") will be acquired at no additional charge.
 4. Whole Body or Whole Limb Radiographs
 - a. These studies are not permissible unless used for a pre-MRI metal scan.
 - b. If you are concerned about both the thorax and abdomen, you must obtain two separate studies. They will be charged accordingly.
 - c. If you are concerned about multiple bones or joints, you should acquire each study separately. Fractures or subtle osteolytic lesions are easily missed on whole limbs studies.

ULTRASOUND – GENERAL

1. Scheduling for ultrasound
 - a. Ultrasound examinations are performed in scheduled 40-minute increments on a first-come-first-serve basis.
 - b. After requesting an ultrasound, please note the time for which your exam is scheduled. If you are more than 10 minutes late for your scheduled time slot, your case will be bumped to the end of the schedule if any remaining time slots are available. If no slots are available, your case will be imaged the following day.
2. Pre-ultrasound radiographs
 - a. Radiographs of the body region to be examined are required for all patients.
 - b. There are exceptions to every rule. If you want an ultrasound on your patient without radiographs, please come speak to the radiologist/imaging house officer on ultrasound for approval before submitting the request.
 - c. Referral radiographs are acceptable to fulfil this requirement if they are of diagnostic quality and recently performed. You must approve any referral radiographs with the resident or radiologist scheduled for ultrasound that day prior to scheduling your ultrasound exam.
 - d. Recheck ultrasounds usually do not require radiographs. Please check with the radiologist/resident on ultrasound before submitting an ultrasound request.
3. Ultrasound preparation
 - a. Fasting is recommended for 6-12 hours prior to the examination.
 - b. Proper shaving is essential for a good ultrasonographic exam. Your patient must be shaved appropriately before coming down for ultrasound.
 - c. The exam will not start until the patient is prepared. This will allow us to more efficiently serve you while preserving our equipment. If you are unsure how much hair to clip, please consult with the sonographer. If you are unable to clip your patient prior to the scan, please discuss the circumstances with the sonographer. There are exceptions to every rule, and this one is no different.
 - d. Please do not clip you patient in ultrasound, as hair can damage the machine.

4. Limited ultrasounds (for example, single organ exams) are only available for recheck examinations. Our service unanimously agrees that performing a limited study for a patient not previously scanned by our service is inappropriate.
5. Sedation for ultrasound
Sedation is not required for examinations, but can increase the quality of the exam for uncooperative or fraction patients. The radiology resident or radiologist may request sedation or terminate the study if the image quality is dramatically affected by patient movement or staff member safety is in jeopardy.

ULTRASOUND GUIDED PROCEDURES

1. Before an ultrasound-guided procedure is performed, it is essential that the clinician on the case discuss it with the radiologist/imaging house officer on ultrasound.
2. Routine thoracocentesis, pericardiocentesis, and cystocentesis should not be performed by radiology without first being attempted by the clinician(s) on the case. These procedures can be performed by internal medicine and other services without our assistance. In fact, these are important skills for internists and other veterinarians to master. If the clinician on the case has attempted any of the above procedures without success, we are happy to help.
3. Please speak with the doctor on ultrasound duty prior to requesting Tru-Cut core biopsies
4. Bloodwork
 - a. A platelet count or buccal mucosal bleeding time is encouraged prior to aspirates.
 - b. A platelet count, PT, and PTT are required before core biopsies are obtained.
5. Sedation
 - a. Sedation or analgesics are strongly encouraged for fine-needle aspirates. The radiologist/resident reserves the right to request sedation or terminate the study if the patient cannot be performed accurately or safely.
 - b. If the animal requires sedation, please do not use hydromorphone (or other full mu agonists) unless absolutely necessary as panting can compromise the procedure.
6. General anesthesia is preferred for core biopsies so that these patients receive the necessary monitoring during and after the procedure.

COMPUTED TOMOGRAPHY (CT)

1. A clinician from the requesting service must speak with a radiology resident or faculty member to schedule a time for a CT. Please do not send a student or technician. Scheduling is performed on a first-come, first-serve basis with exceptions made for urgent, triage needs. CTs may be requested at any time, but they will not be scheduled and/or performed prior to speaking with a clinician.
2. Radiographs of the CT area of interest are not required prior to CT for the following procedures unless requested by the clinician on the case or the attending radiologist or radiology house officer.

3. Contrast CT Studies
 - a. Pre- and post-contrast studies are performed in most cases. Exceptions include IVDD, elbow dysplasia, trauma, and other primarily orthopedic conditions. Please consult the radiologist or imaging house officer if there is a question.
 - b. Patients must be hydrated to safely receive contrast. Dehydrated patients are at an increased risk for contrasted related acute kidney injury and renal failure.
 - c. If contrast is to be used, please make certain an intravenous catheter is placed prior to sedation. A forelimb catheter is essential for shunt studies, and preferred for all other studies.
4. Large Animal CT Studies
 - a. If possible, please give 2-3 days advanced notice to radiology if a large animal CT is to be performed.
 - b. If contrast will be used for large animal CT scans, the contrast media must be ordered from the pharmacy in advance by the requesting service as radiology does not stock the large volume of contrast required for these studies.

FLUOROSCOPY

1. Please consult a radiologist or radiology house officer upon request of a fluoroscopic study. Some of these studies require preparation of the animal.
2. A radiologist or radiology house officer must be present for fluoroscopy. This is a dynamic study and is difficult to interpret accurately from saved images. Each radiologist and resident interprets his or her own fluoroscopic studies.
3. The C-ARM fluoroscopy unit is shared by the radiology and surgery services. Hence, fluoroscopic services may be limited during times of intra-operative use.
4. Fluoroscopic studies are performed in the back room (DR room). Prolonged fluoroscopic studies may delay other more routine radiographic studies.

CONTRAST STUDIES

1. Please consult a radiologist or radiology house officer upon request of a contrast study. Some of these procedures are time consuming and may interfere with further diagnostics later on. Also, most contrast studies require prior patient preparation. If a procedure is commenced without consultation, there could be inappropriate time and money spent. We are trained to know which procedure is best for certain conditions. We can then discuss patient preparation and coordinate schedules.
2. A radiologist or radiology house officer should be available at the beginning of a study and at the end to determine if further images are needed. Please do not administer contrast of any kind without consulting a radiologist, radiology resident, or radiology technologist.

CLIENTS

1. Clients are not allowed in radiology for any reason.

The only exception to this rule is doctors or staff currently working for the Animal Health Center or students currently enrolled in the DVM program at Mississippi State University.

 - a. Safety: The public are not permitted to be around ionization radiation.

- b. Confidentiality: Radiology services numerous patients simultaneously. All imaging equipment publicly displaces personal patient and client information.
 - c. Efficiency: Because ionization radiation equipment cannot be operated around the public, clients in radiology dramatically reduces efficiency.
2. Images may be reviewed with clients on the exam-room computers or on the PACS work station in the equine area.
 3. Medical records fulfills client and RDVM requests for copies of images or radiology reports.
 4. If you have a client who cannot leave the patient (for instance, in some cases of law enforcement or military working dogs), please let radiology know so we can prepare. Note this does not apply to private owners.

EMERGENCY/AFTER HOURS IMAGING

1. Radiographs:
 - a. When you require any after-hours imaging, submit a request as you would during the day. A request is still required to perform and complete all studies as it contains patient information, a history, and the study's required accession number.
 - b. Please call in the on-call emergency radiology students to perform the requested studies.
 - 1) Please do not call the students in until the request has been submitted and the patient is stable and ready for imaging.
 - 2) If someone does not immediately pick up, always leave a voice mail.
 - 3) Texting should not be used as a primary means of contact for any on-call students or staff.
 - 4) It is ok to only call one radiology student and ask that they contact their on-call partner. This will save you a little bit of time.
 - c. Please make certain all emergency patients are stabilized prior to pursuing imaging studies.
 - d. Our students will execute studies identical to the standard operating procedures performed during the day. Do not ask our students to deviate from procedures unless the patient genuinely decompensates or necessitate such action.
 - e. Please properly sedate animals prior to orthopedic imaging. Pain precludes proper position, hence affecting diagnostic quality.
 - f. You are NOT required to call in the radiology students for imaging. They are available for your convenience. If you cannot wait for the students to arrive (for instance, you suspect a GDV), you are more than welcome to take the images yourself with your ICU students.
2. Orthopedic studies performed after hours:
 - a. The majority of orthopedic studies obtained after hours are intended to screen for obvious abnormalities such as fractures. In these instances, perfect is not expected. Please do appropriately sedate patients and administer analgesics as proper positioning depends on patient compliance.
 - b. Please do not perform routine orthopedic studies after hours unless absolutely necessary and directed by a supervising clinician.
 - c. This does not apply to post-operative orthopedic imaging which is necessary since some surgeries run after-hours. Post-operative imaging should always be performed immediately following the surgery.

3. Number of radiographic exposures for after-hours cases:
 - a. In the past, there have been instances where students were instructed to perform an excessive number of retakes (e.g., 18) for a single study. While we want to perform quality studies every time, we must balance quality with radiation safety.
 - b. Students are not allowed to and should not be asked to make more than 3 attempts per radiographic projection. For example, if obtaining a three-view thoracic study, that equates to 3 shots for each lateral and 3 shots for the VD projection = 9 total.

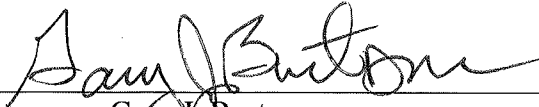
4. Consultations on radiographs or other studies:
 - a. All studies performed on emergency are eventually reviewed by the radiology team the next business day. A report will be generated as it would be for any other study.
 - b. An on-call radiology resident/radiologist is available for consultation on any radiographic study if there are further questions or concerns after first reviewing them with your supervising clinician. We encourage calls where the results of the imaging study will dramatically change what happens with the patient after hours. This also applies to cross sectional imaging.
 - c. Only a house officer or the senior clinician should be calling to speak to the radiology resident.
 - d. There is no charge to the client for speaking with the radiology resident/radiologist, but one will be assessed if they come in to perform any studies.

5. When should I call the on-call technologist?
 - a. For any spine or skull imaging
 - b. For any equine imaging
Note: equine clinicians are allowed to perform imaging themselves without calling the on-call technologist; however, radiology students should not be called in to perform these studies.
 - c. For CT studies
 - d. For any other technical questions involving studies or the equipment.
 - e. There is no fee for calling the technologist, but one will be assessed if they come in to perform any studies.

6. Ultrasound Studies:
 - a. Ultrasound studies are available afterhours on an as-needed basis. An emergency fee is assessed to the client for after-hours ultrasounds. Ultrasounds are reserved for cases where the results will dramatically change what is done after hours.
 - b. If you think an ultrasound is needed on one of your emergency cases, you must first discuss the case with your supervising clinician. Your back-up clinician will then decide if this study is needed and will call the radiologist/resident on duty.
 - c. When calling to request an ultrasound, the radiologist/resident will discuss with you the details of the case, including history, physical exam findings, bloodwork abnormalities, and radiographic findings.
 - d. If you call in a radiologist/resident is called in for ultrasound, please have the animal ready when we arrive.

7. Computed tomographic studies:
 - a. Computed tomographic studies are available after hours on a case-by-case basis.
 - b. These studies must be approved by your supervising senior clinician.
 - c. The on-call technologist should be called in to perform these studies. An emergency fee will be assessed.

- d. The radiology resident/radiologist need not be called unless consultation is required for interpretation.

Approved:  9-15-21
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