



## Minimum Standards for ACVS Fellowship Training in Minimally Invasive Surgery March 2024

A Fellow or Founding Fellow, is a Diplomate of the American College of Veterinary Surgeons (ACVS) who has obtained additional training and experience in Minimally Invasive Surgery and who devotes a major portion of his or her professional effort toward these activities and to research in this field. Fellow status may be achieved in the following disciplines:

1. Small Animal Soft Tissue (laparoscopy and thoracoscopy)
2. Large Animal Soft Tissue (laparoscopy and thoracoscopy)
3. Small Animal Orthopedics (arthroscopy and fracture repair)
4. Large Animal Orthopedics (arthroscopy, tenoscopy, bursoscopy and fracture repair)

### **I. Objective**

The objectives of the **ACVS Fellowship Training in Veterinary Minimally Invasive Surgery** are to build on the surgical knowledge and experience obtained during a surgical residency through an intense period of applied focus on the minimally invasive surgical management of diseases as it relates to comprehensive care, and to encourage a lifetime emphasis of excellence in the field of **minimally invasive surgery (MIS)**. A Fellowship Training Program in Veterinary MIS should prepare its graduates to successfully interact with other disciplines and to provide a leadership role in the surgical, medical, and lay communities in matters pertaining to MIS. It is expected that most graduates of Fellowship Training Programs in MIS will devote a major portion of his or her professional effort to the prevention, diagnosis, treatment, and rehabilitation of patients undergoing these therapies and to research in the field of MIS.

Following such Fellowship training, an ACVS Founding Fellow or Fellow in **MIS** should have a high level of expertise in the selection of patients for minimally invasive procedures. Furthermore they should have attained a high level of proficiency in performing these procedures as well as preoperative and postoperative care and management of morbidity related to the procedures. The MIS Fellow must be proficient in knowledge of the benefits and risks associated with a multidisciplinary approach that includes surgical treatment.

## II. Definitions:

- A. **“ACVS Fellowship Training Program in Veterinary MIS**: For each Fellow Candidate, a mentored training program of specific application, duration, curriculum, and evaluation for completion as specified later in this document.
- B. **Fellowship vs. Residency**: The MIS Fellowship differs from the Surgical Residency. The surgical residency and MIS fellowship training periods may not overlap. The MIS fellowship training may occur at any time following completion of residency training and is distinguished from the general residency training, by its focus on **MIS in animals**.
- C. **Primary Mentors and Program Directors**: Only an ACVS Diplomate, in good standing, who is an ACVS Fellow or ACVS Founding Fellow may mentor a fellow candidate or be on record as a program director in the appropriate discipline. Primary mentors and program directors must maintain ACVS Diplomate status according to ACVS criteria. The same individual may serve as both institutional program director and primary mentor. For each fellowship program, the minimum requirement for the number of mentors is one ACVS Fellow or ACVS Founding Fellow in the discipline per fellow candidate, although more than one mentor in the training program is preferable (e.g., two fellows may have two fellow candidates in a program at the same time). If there are multiple fellows and fellow candidates in a fellowship program, during a given clinical week, an ACVS Fellow or ACVS Founding Fellow may supervise the training of two fellow candidates simultaneously in their discipline, however, each surgical case may only be claimed as “primary surgeon” by a single fellow candidate.
- D. **Supervising Mentors**: Supervising mentors are those who are directly supervising the Fellow Candidate the majority of time during their fellowship training. They are the Program Director, Primary Mentor and other ACVS Founding Fellows or Fellows.
  - a. ACVS fellowship trained ECVS Diplomates can supervise fellowship training up to, but no more than, 30% of the required training weeks for any fellow candidate in training. These individuals must provide documentation certifying completion of ACVS fellowship training to the ACVS office prior to serving as a supervising mentor. Permitting ECVS Diplomates to serve as supervising mentors as described in this section applies to all current and future ACVS Fellowship Programs.
- E. **Supporting Faculty**: Supporting faculty are all faculty, other than supervising mentors, involved in training of the Fellow Candidate. This includes:
  - a. Board-certified anesthesiologist, radiologist, or other specialists

b. Other ACVS Diplomates who are not Founding Fellows or Fellows and ECVS Diplomates.

- F. **The title “ACVS Founding Fellow, MIS:** An ACVS Diplomate who has received Fellow status as a result of credentials that were submitted, reviewed and approved during the open call for Founding Fellows for one year after approval of the Fellowship by the ACVS Board of Regents and announcement of the Fellowship to the ACVS membership.

The following seven ACVS Diplomates will be organizers of the **MIS Small Animal Soft Tissue Fellowship** based on their national and international recognition in the field of MIS:

Dr. Boel Fransson (Small Animal)  
Dr. Lynn Freeman (Small Animal)  
Dr. Phil Mayhew (Small Animal)  
Dr. Tim McCarthy (Small Animal)  
Dr. Eric Monnet (Small Animal)  
Dr. MaryAnn Radlinsky (Small Animal)  
Dr. Clarence Rawlings (Small Animal)

The following six ACVS Diplomates will be organizers of **the MIS Large Animal Soft Tissue Fellowship** based on their national and international recognition in the field of MIS:

Dr. Carolyn Arnold (Large Animal)  
Dr. John Caron (Large Animal)  
Dr. Jeremiah Easley (Large Animal)  
Dr. Dean Hendrickson (Large Animal)  
Dr. Claude Ragle (Large Animal)  
Dr. David G Wilson (Large Animal)

The following eleven ACVS Diplomates will be organizers of the **MIS Small Animal Orthopedics Fellowship** based on their national and international recognition in the field of MIS:

Dr. Brian Beale (arthroscopy and fracture MIS)  
Dr. Don Hulse (arthroscopy and fracture MIS)  
Dr. Wayne Whitney (arthroscopy)  
Dr. Kurt Schulz (arthroscopy)

Dr. Michael Kowaleski (arthroscopy and fracture MIS)  
Dr. Antonio Pozzi (arthroscopy and fracture MIS)  
Dr. Ian Holsworth (arthroscopy)  
Dr. Ken Bruecker (arthroscopy)  
Dr. Sue Schaefer (arthroscopy)  
Dr. Loic Dejardin (arthroscopy and fracture MIS)  
Dr. James Tomlinson (fracture MIS)

The following six ACVS Diplomates will be organizers of **the MIS Large Animal Orthopedic Fellowship** based on their national and international recognition in the field of MIS:

Dr. Wayne McIlwraith (arthroscopy and tenoscopy)  
Dr. Larry Bramlage (arthroscopy)  
Dr. Dean Richardson (arthroscopy)  
Dr. Laurie Goodrich (arthroscopy)  
Dr. David Frisbie (arthroscopy and tenoscopy)  
Dr. Chris Kawcak (arthroscopy and tenoscopy)  
Dr. Alan Nixon (arthroscopy and tenoscopy)

Applicants for each MIS discipline must have completed the following minimum requirements prior to submitting their application for Founding Fellow status:

- Having at least three years of experience with MIS excluding their residency training.
- Being an ACVS Diplomate for a minimum of five years
- Having at least three scientific publications as a primary or corresponding author related to surgical laparoscopy and thoracoscopy or arthroscopy or minimally invasive fracture fixation. Review articles or articles in *Compendium* and *Veterinary Clinics*, case series with less than 6 cases or single case reports will not qualify unless they describe a new technique.
- Having presented 5 abstracts on MIS at the ACVS Symposium/Surgical Summit or ECVS annual meeting, or equivalent national or international meetings including:
  - Veterinary Endoscopy Society (VES) for soft tissue surgery (laparoscopy and thoracoscopy)
  - Veterinary Orthopedic Society (VOS) or European Society of Veterinary Orthopedics and Traumatology (ESVOT) for orthopedics (arthroscopy and minimally invasive fracture fixation)

- Two letters of recommendation from ACVS Diplomates recognized as leaders in MIS documenting the interest of the ACVS Diplomate in Minimally Invasive Surgery
- G. **The title “ACVS Fellow, MIS (Small Animal Soft Tissue), MIS (Large Animal Soft Tissue), MIS (Small Animal Orthopedics) or MIS (Large Animal Orthopedics):** An ACVS Diplomate who has successfully completed an ACVS Fellowship Training Program in a Veterinary MIS described discipline from 2016 onwards. To earn the title “Fellow, MIS the individual must first achieve Diplomate status in the ACVS. Thus, one cannot become an ACVS Fellow until one is first boarded by the ACVS as a surgeon.
- H. **The title for the Fellowship Candidate is “Fellow Candidate, MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics)”**: A person currently enrolled in a Fellowship Training Program in Veterinary MIS who has not yet completed that program may use this title in correspondence or other means of communication.
- I. **Terminology for a person who completed an ACVS Fellowship Training Program in veterinary MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics) but is not ACVS board certified:** a person who has completed an ACVS Fellowship Training Program in veterinary MIS (and has not passed the ACVS certifying examination may indicate only that they have completed a Fellowship Training Program in the veterinary MIS discipline. No connection to the ACVS may be implied. Terms such as "ACVS Fellow eligible" and “completed an ACVS Fellowship Training in MIS (Small/Large Animal Soft Tissue or Orthopedics)” should not be used. An individual who identifies their professional credentials using these terms may be eliminated from the approval process.
- J. **Fellow-In-Training Clinic Week:** The fellow-in-training clinic week is defined as a minimum of five full working days in the clinic and may include additional night and weekend patient care as specified by the mentor, program and institution.
- K. **Mentor Work Week:** The mentor work week is defined as a minimum of 3 working days on site with the Fellow Candidate outside of which the mentor remains available to the Fellow Candidate for consultation by the most efficient and appropriate means. This may include a personal visit or by telecommunication. The emphasis is that the mentor must support the Fellow Candidate and assure patient safety and care.
- L. **Trackable Surgical “MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedic or Large Animal Orthopedic)” Case:** A MIS case that can be tracked in the Fellowship Training Case Log and counted as a “trackable”

case is a surgery that is “performed under ” a MIS mentor in the appropriate discipline. This means that the case is operated during a fellow-in-training clinic week wherein the mentoring MIS Fellow is on site. The mentor may be physically present in the operating room or, if the Fellow Candidate possesses sufficient training to proceed alone, the mentor is available for appropriate consultation.

### III. Institutional Requirements

- A. The MIS Fellowship training must be conducted at a veterinary medical facility (hospital or institution) that offers the scope, volume, and variety of patients affected with both minimally invasive surgical and non-minimally invasive surgical conditions as well as the complimentary services necessary to care for these patients including:
- on-site medical imaging facilities (an on-site or off-site radiologist will be acceptable)
  - critical care facilities
  - on-site board-certified anesthesiologist
  - on-site simulator to practice psychomotor skills
- B. Fellow Candidates should have a broad exposure to advanced imaging techniques, anesthesiologists with experience in anesthesia for minimally invasive procedures, and advanced MIS procedures. Training institutions will need to carefully consider whether they can provide the depth and breadth of training required before agreeing to participate in the training of a MIS Fellow.
- a. Fellow Candidates in MIS, Small or Large Animal should have exposure to anesthesiologists with experience in anesthesia for minimally invasive procedures.
  - b. Fellow Candidates in MIS, Small or Large Animal Soft Tissue should have exposure to advanced laparoscopic and thoracoscopic techniques that are distinct from those surgical residents are exposed to.
  - c. Fellow Candidates in MIS, Small or Large Animal orthopedics should have exposure to advanced arthroscopic, non-invasive fracture repair, tendon and bursa techniques that are distinct from those surgical residents are exposed to.
- C. Clinical experience alone is insufficient education in MIS. The training program must include a regularly scheduled didactic program consisting of lectures, debate series, and/or journal clubs, covering not only clinical surgical problems

but also nonsurgical, perioperative management, basic science, and clinical research.

- D. A written agreement crafted by the institution, to participate in the training of the Fellow Candidate (*Fellowship Training Agreement*) must be formally documented by both the primary training institution (Department Head or Hospital Director) and the responsible host mentor at all ancillary institutions (if training will occur at more than one facility). This agreement will serve to define the clinical and educational relationship between the Fellow Candidate and the training institution(s) as to their responsibility to provide mentorship to the Fellow Candidate for the entirety of their program. This training agreement must specify the agreed duration of the training program (minimum of one year, maximum of 3 years), which should be determined before training begins. This agreement is retained by the institution.
- E. Each institution will craft a statement (*Statement of Compliance*) to be signed by the Fellow Candidate. This statement will indicate the Fellow Candidate understands to undertake their clinical role with the utmost integrity, care, professionalism, and responsibility to the institution and the patients whom they serve. The statement may also specify certain specific expectations of day-to-day work responsibilities and schedules. Licensing requirements for practice at each institution are the responsibility of the Fellow Candidate, and the Candidate is expected to remain in good standing throughout the Fellowship Training Program in veterinary MIS with both the training institutions and all state and federal licensing agencies.

#### **IV. Fellow Candidate Requirements**

- A. The Fellow Candidate must have completed an ACVS surgical residency prior to beginning an ACVS Fellowship Training Program in Veterinary MIS. It is not necessary to be board-certified by the ACVS before beginning the program, however it is necessary to become board-certified by the ACVS before earning the title of ACVS Fellow, Minimally Invasive Surgery (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics). No aspects of the surgical residency can be applied toward the requirements of Fellowship Training.
- B. The Fellow Candidate must register with ACVS at least 60 days prior to the start date of the Fellowship Training Program in Veterinary MIS (Small Animal Soft

Tissue, Large Animal Soft Tissue, Small Animal Orthopedics, or Large Animal Orthopedics). The Fellow Candidate must work with the Program Director and Primary Mentor to complete the *ACVS Fellowship Training Program in Veterinary MIS Registration Form*. Required information includes:

1. The name of the institution(s) or hospital(s) where the Fellowship Training Program will primarily take place
  2. The name and contact information for Fellowship Training Program Director and Primary Mentor.
  3. A list of ACVS Founding Fellows, ACVS Fellows, and ACVS fellowship trained ECVS Diplomates (who are permitted to supervise fellowship training up to, but no more than, 30% of the required training weeks for any fellow candidates in training) who will be included on the team of supervising mentors for the Fellow Candidate.
  4. The names and contact information of required specialists (supporting faculty) involved in training the Fellow Candidate. Supporting faculty must include at least one board-certified radiologist (on or off site is acceptable) and one board-certified anesthesiologist. A full-time specialist is defined as someone who is physically present at least 3 working days of each week concurrent with the working days of the Fellow Candidate. The specialists will need to indicate their willingness to assist in training of the Fellow Candidate and that they have read and understood the specific requirements of the ACVS Fellowship Training Program outlined herein.
  5. A Fellow Candidate registration fee (\$1,000)
  6. Acknowledgement of a *Fellowship Training Agreement* between the institution and the responsible host mentor at all ancillary institutions (if training will occur at more than one facility). (See III: Institutional Requirements, section D.)
  7. Acknowledgment of the signed *Statement of Compliance* between the Fellow Candidate and institution regarding the Fellow Candidate's responsibility to the institution. (see III: Institutional Requirements, section E.)
  8. The signatures of the Fellow Candidate, Program Director, and Primary Mentor.
- C. The Fellow Candidate shall provide to each training institution a signed *Statement of Compliance*, crafted by the institution, indicating their understanding to undertake their clinical role with the utmost integrity, care, professionalism, and responsibility to the institution and the patients whom they



serve. The statement may also specify certain specific expectations of day-to-day work responsibilities and schedules. Licensing requirements for practice at each institution are the responsibility of the Fellow Candidate, and the Fellow Candidate is expected to remain in good standing throughout the Fellowship Training Program in Veterinary MIS with both the training institutions and all state and federal licensing agencies.

- D. The Fellow Candidate must act as first assistant or primary clinician/surgeon on all cases assigned by the faculty mentor(s). The Fellow Candidate is responsible for reviewing the **minimally invasive** and surgical literature as to the surgical and nonsurgical procedures, approaches, options and adjuvant therapies for all cases assigned to them or seen by the mentoring faculty on clinic with them and any case on the service that will be going to surgery. The Fellow Candidate is responsible to report to the faculty mentor(s) any complications, client complaints, or concerns as soon as they are known and for creating appropriate medical record documentation while on clinic.
- E. The Fellow Candidate shall keep a case log listing the cases operated. This should include the medical record number and the general type of surgery (MIS) and whether the cases were directly supervised by mentoring faculty or non-supervised. This will be submitted along with the activity week logs, to the ACVS office to be reviewed by the appropriate MIS discipline (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics) Fellowship Oversight Committee, half way through the Fellowship and again at the end of the Fellowship Training Program.
- F. The Fellow Candidate must publish and provide evidence of a manuscript that has been accepted as a peer reviewed publication. Similarly for fellowship programs having requirements for atlas-style website publications (currently applicable for Joint Replacement, Surgical Oncology, and Minimally Invasive Surgery Fellowship Programs), the Fellow Candidate must provide evidence the digital contribution has been accepted with peer review.

The publication(s) may follow either of the following formats:

- o A publication driven by prospective or retrospective hypothesis following the scientific method, **AND**

- o A single case report of an advanced surgical procedure or related technique supplemented by detailed photographs and, as useful, video to be published on the Veterinary Endoscopy Society (VES) website or an acceptable equivalent. An accompanying narrative should include a brief analytical literature review including the indications and alternatives to the procedure; important rudiments of knowledge (anatomy, physiology, pathophysiology, microbiology, etc.); a description of potential complications of the procedure as reported and encountered; how each complication might be avoided and a bibliography.
  
- G. It is possible that during the Fellowship training period one of several key events might occur, including departures of: the Program Director, Primary Mentor, the full-time board-certified radiologist or anesthesiologist. In the event of any of the above or any other significant change in the program occurring, it is the responsibility of the Fellow Candidate to contact the appropriate MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics) Fellowship Oversight Committee as soon as possible with a clearly defined and outlined solution. A modification to any registration information must be reported to the ACVS office within 60 days of the key event. In the event of the Primary Mentor leaving, no more 'Fellow-in-Training Clinic Weeks' can be logged until a new mentor has been identified and the change to the program approved by the MIS Fellowship Oversight Committee. Fellow Candidates should be clear that such significant change might result in a delay of several months to the training program, and if no acceptable solution can be found, the training program might be terminated.

**V. Program Director and Primary Mentor Expectations:**

- A. The Program Director and the Primary Mentor must be ACVS Diplomates, in good standing, and either an ACVS Fellow or Founding Fellow in MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics).
  1. Primary Mentors and Program Directors must maintain ACVS certification according to ACVS criteria.
  2. The same individual may serve as both institutional MIS Director and Primary Mentor in the specific discipline.
  3. An individual Primary Mentor can be a mentor for no more than one Fellow Candidate at a time. Two supervising mentors could supervise two

candidates who alternate between them, although there must be a clearly defined Primary Mentor for each candidate.

- B. The ACVS Fellowship Training Program in Veterinary MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics) is considered an intensively mentored experience. This may require varying levels of direct (i.e., at the table) supervision at different phases of the Fellow Candidate's training. Fellow Candidates have completed a surgical residency and therefore should begin their Fellowship Training Program with certain core surgical competencies. Nonetheless, good surgical decision making in complex minimally invasive cases and optimal integration of surgical intervention with other treatment modalities requires experience.
  - 1. The Fellow Candidate must receive mentored assistance or observation on a case-by-case basis until such a time that the Fellow Candidate is competent to proceed with similar cases unassisted and unobserved.
  - 2. The supervising mentor must be available for consultation at all times during the Fellowship experience. While the *Primary* Mentor may not be personally available at all times, he or she should ensure that there is mentorship available at all times. The mentor should be available at least 3 regular full work days per clinic week for that week to be counted towards the Fellow Candidate's case log. During the training period, it remains the responsibility of the mentor(s) to be aware and proximate enough to ensure patient safety. An ACVS Diplomate who is not a Founding Fellow or Fellow may provide supervision when the Primary Mentor or other supervising mentor is not available; however surgeries performed under these circumstances will need to be reviewed by the Primary Mentor in order to be counted as trackable cases.
- C. The Program Director must assure each Fellow Candidate's progress during the program is formally evaluated in writing and feedback provided to the Fellow Candidate at least semi-annually.
  - 1. The Program Director or the Primary Mentor can perform this function.
  - 2. The Fellow Candidate should be advised of any deficiencies in time to correct problems prior to completion of the Fellowship Training Program and a performance improvement plan put in place if deficiencies are identified. If satisfactory improvement is not met in the specified time frame, the Fellow Candidate can be dismissed from the training program.

- D. Fellow candidates must be provided an opportunity to evaluate the overall fellowship training program, as well as all educational events, rotations, conferences, and faculty. These evaluations should be confidential and should be submitted by the fellow candidate to the Fellowship Committee's ACVS staff liaison. The staff liaison will compile the information and submit it to the Fellowship Committee for review.
- E. Every three years, the Fellowship Committee will complete a full review of the evaluations provided by fellow candidates to determine whether the goals of the training program are being achieved and whether ancillary institutions/faculty are effective in their training mission.

## **VI. Specific Program Requirements**

- A. The ACVS MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics) Fellowship Oversight Committee will review for approval each Fellowship Training Program request by a Fellow Candidate. Requests to initiate programs must be made at least 60 days prior to the start of the Fellowship Training period to allow time for the Fellowship Oversight Committee to review the program plan. The program approval will remain in force for 3 years providing no substantive changes in the program or personnel occur.
- B. Review of the primary training institution's oversight of Fellowship Training Programs will occur once every 3 years or when substantive changes occur to ensure the minimum standards are met. On behalf of each primary training institution, Program Directors shall submit documentation for each Fellow Candidate directed over the last three years.
- C. A Fellow Candidate may complete a Fellowship Training Program in a minimum of one year but must be completed in a maximum of three years.
- D. The Fellowship Training must include a minimum of 40 weeks on clinics. A Fellow Candidate's clinic "week" is defined as at least 5 full work days and appropriate case management on nights and weekends (see II. Definitions, section J).
- E. Two weeks will be assigned to an outside rotation in a human hospital to observe minimally invasive surgery in the disciplines of Small Animal Soft Tissue, Large Animal Soft Tissue, and Small Animal Orthopedics.
- F. One week will be dedicated to attending MIS meetings appropriate for the MIS discipline.

- a. Small Animal Soft Tissue and Large Animal Soft Tissue disciplines the VES meeting is a compulsory meeting to attend and another meeting such as an advanced MIS course or human MIS course is required.
  - b. Small Animal Orthopedic and Large Animal Orthopedic disciplines recommends attending the Veterinary Orthopedic Society meetings and an advanced arthroscopic course is mandatory
- G. Up to seven weeks during the one year Fellowship can be taken for research.
- H. Two additional weeks off clinic time are to be scheduled for vacation.
- I. Fellowship Training Programs occurring over a period longer than one consecutive year must include clinical rotation blocks of no less than two consecutive weeks to ensure an appropriately intensive clinical experience.
- J. A regularly scheduled didactic program consisting of attendance at case conferences/ journal clubs covering MIS topics appropriate to the discipline, basic science, clinical research and rehab should be organized. These should be outlined at the beginning of the Fellow Candidate's program and involve no less than 20 attended sessions in a broad cross section of the above topics.
- K. Presentation of three comprehensive MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics) case discussions to an audience that includes their mentors and may include other ACVS Diplomates, and residents. The cases presented should represent complex multi-disciplinary approaches to the management of a surgical patient. The intention of the audience is to prepare the Fellow Candidate to successfully interact with the other related disciplines and begin to provide a leadership role in the link between the disciplines. Case presentations may be teleconferenced to enable participation of a number of MIS Fellows or Founding Fellows.
- L. Required learning objectives for MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics)
- a. **Radiology – Appendix 1**  
Mastery of these learning objectives must be documented by the board-certified radiologist who was identified as participating faculty at the start of the Fellowship Training Program. If the Fellowship Training Program is designed such that focused clinical weeks (rotations in radiology) must occur in order to master the required training objectives, such clinical weeks (rotations) must occur in addition to the 40 clinical training weeks specified for MIS case experience.
  - b. **Anesthesiology – Appendix 2**  
Mastery of these learning objectives must be documented by the board-certified anesthesiologist who was identified as participating faculty at the

start of the Fellowship Training Program. If the Fellowship Training Program is designed such that focused clinical weeks (rotations in **anesthesiology**) must occur in order to master the required learning objectives, such clinical weeks (rotations) must occur in addition to the 40 clinical training weeks specified for surgical MIS case experience.

- M. Minimum case requirements (see specific numbers for specific disciplines below): A minimum number of cases performed under MIS Fellow or Founding Fellow mentorship in the appropriate discipline during the MIS Fellowship Training Program. The Fellow Candidate can either be the primary surgeon or first assistant on the case in order for the case to be counted toward case minimum. If multiple Fellow Candidates scrub on a case, only one person can count as primary and one as first assistant.
- a. Small Animal Soft Tissue 60 MIS cases minimum
  - b. Large Animal Soft Tissue 30 MIS cases minimum
  - c. Small Animal Orthopedics 130 MIS cases minimum
  - d. Large Animal Orthopedics 135 MIS cases minimum
- N. The type of MIS procedures must demonstrate sufficient depth and breadth of diversity and advanced skills. The distribution of cases should be as follows: (see **Appendix 3**). The Primary Mentor must sign off on all surgical case logs at the end of the fellowship training.
- Small Animal Soft Tissue 60 MIS cases minimum**
- 40 laparoscopy (30 basic; and 10 advanced)
  - 20 thoracoscopy
- Equine Soft Tissue 30 MIS cases minimum**
- 30 laparoscopic (25 basic and 5 advanced)
- Small Animal Orthopedics 130 MIS cases minimum**
- 100 arthroscopic (75 basic and 25 advanced)
  - 30 fractures (20 basic and 10 advanced)
- Large Animal Orthopedics 135 MIS cases minimum**
- 120 arthroscopic (70 basic and 50 advanced)
  - 12 tenoscopic (5 basic and 7 advanced)
  - 3 bursoscopy (0 basic and 3 advanced)
- O. Publication (See Section IV: Fellow Candidate Requirements)
- P. Fellow Candidates in Small Animal and Large Animal Soft Tissue MIS programs must achieve a score of 348 on the Veterinary Assessment of Laparoscopic Skills (VALS) evaluation.
- Q. The Primary Mentor, the Program Director, and supporting faculty will determine if the Fellow Candidate has successfully completed the Fellowship

Training Program at the end of the Fellowship Training Program. The Fellow Candidate must submit the following within 3 years of initiating the Fellowship Training Program to be considered for the designation of ACVS Fellow in MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics):

- letter of intent to become an ACVS MIS (specific discipline) Fellow
- supporting letters from the Program Director and Primary Mentor indicating successful completion of the program
- all supporting documentation (case logs, signed documentation of other required specialty training, case presentations, etc.). Review by the MIS Fellowship Oversight Committee, ACVS Fellowship Committee and ACVS Board of Regents will occur within 6 months of submission of materials to the ACVS office.

R. Activities of the Fellow Candidates in MIS (Small Animal Soft Tissue, Large Animal Soft Tissue, Small Animal Orthopedics or Large Animal Orthopedics) Fellowship Programs will be monitored by the MIS Fellowship Oversight Committee. The MIS Fellowship Oversight Committee will provide a report to the ACVS Fellowship Committee each fall specifying:

- number and location of fellowship programs
- names of Fellow Candidates pursuing fellowships
- results of requirement completion
- requests for program modification

S. After Fellow Candidates successfully complete all program requirements, the ACVS Board of Regents will grant Fellow status based on the recommendation of the MIS Fellowship Oversight Committee and review of the ACVS Fellowship Committee.

## **Appendix 1**

### **ACVS MIS Fellow Required Radiology Rotation Learning Objectives**

#### **Small Animal Soft Tissue MIS Fellowship:**

- 1) The Fellow Candidate will demonstrate knowledge of the indications for plain film radiography, contrast radiographic techniques, ultrasonography, computed tomography (CT) and magnetic resonance imaging (MRI) relevant to surgical disease where MIS procedures might be indicated.
- 2) The Fellow Candidate will demonstrate knowledge of the diagnosis of vascular invasion by different tumors with different imaging techniques: ultrasound, CT angiograms.
- 3) The Fellow Candidate will demonstrate knowledge of the diagnosis of gallbladder rupture, inflammation around the gallbladder, and obstruction of the common bile duct with different imaging modalities.
- 4) The Fellow Candidate will demonstrate knowledge of the localization of lymph nodes on CT and ultrasound.
- 5) The Fellow Candidate will demonstrate knowledge of the diagnosis of splenic nodules and determination of their size using ultrasound.
- 6) The Fellow Candidate will demonstrate competence in the reading of plain film radiographs relevant to surgical diseases where minimally invasive procedures might be indicated.
- 7) The Fellow Candidate will demonstrate competence in the reading of computed tomographic scans relevant to surgical diseases where minimally invasive procedures might be indicated.
- 8) The Fellow Candidate will demonstrate competence in the use of intraoperative fluoroscopy and its interpretation for minimally invasive interventions

#### **Large Animal Soft Tissue MIS Fellowship**

- 1) The Fellow Candidate will demonstrate knowledge of transrectal and percutaneous ultrasonographic anatomy of the equine and ruminant abdomen.



- 2) The Fellow Candidate will demonstrate knowledge of percutaneous ultrasonographic anatomy of the equine and ruminant thorax.
- 3) The Fellow Candidate will demonstrate knowledge of ultrasonographic diagnosis of left dorsal displacement of the horse's large colon.
- 4) The Fellow Candidate will demonstrate knowledge of ultrasonographic diagnosis of inguinal herniation in the horse.
- 5) The Fellow Candidate will demonstrate knowledge of ultrasonographic diagnosis of abdominal retention of the testis in large animals.
- 6) The Fellow Candidate will demonstrate competence in reading and evaluation of transrectal and percutaneous abdominal ultrasound examinations.
- 7) The Fellow Candidate will demonstrate competence in reading and evaluation of transrectal and percutaneous thoracic ultrasound examinations.

#### **Small Animal Orthopedics MIS Fellowship**

- 1) The Fellow Candidate will demonstrate knowledge of the indications for plain film radiography, contrast radiographic techniques, ultrasonography, CT and MRI relevant to surgical diseases where arthroscopic procedures might be indicated.
- 2) The Fellow Candidate will demonstrate knowledge of the radiographic and CT findings related to elbow dysplasia and the jump down syndrome.
- 3) The Fellow Candidate will demonstrate an understanding of the radiographic and CT findings related to osteochondritis dissecans (OCD) of the shoulder, elbow, stifle and hock.
- 4) The Fellow Candidate will demonstrate knowledge of radiographic, ultrasound and MRI findings related to shoulder instability.
- 5) The Fellow Candidate will demonstrate understanding of the radiographic findings related to partial tear of the cranial cruciate ligament.
- 6) The Fellow Candidate will demonstrate competence in reading of radiograph images relevant to surgical diseases where arthroscopy may be indicated.

- 7) The Fellow Candidate will demonstrate competence in reading of ultrasound images relevant to surgical diseases where arthroscopy may be indicated.
- 8) The Fellow Candidate will demonstrate competence in reading of CT images relevant to surgical diseases where arthroscopy may be indicated.
- 9) The Fellow Candidate will demonstrate competence in reading of MRI images relevant to surgical diseases where arthroscopy may be indicated.

#### **Large Animal Orthopedics MIS Fellowship**

- 1) The Fellow Candidate will demonstrate knowledge of the indications for digital radiography, contrast radiographic techniques (as appropriate), ultrasonography, CT, and MRI relevant to surgical disease where arthroscopic procedures might be indicated.
- 2) The Fellow Candidate will demonstrate knowledge of ultrasonographic examination of the joints and tendon sheaths as these are an important part of the practice of arthroscopic surgery, particularly in the femorotibial articulation where MRI is not possible.
- 3) The Fellow Candidate will demonstrate knowledge of the use of CT related to in-depth examination of joints where the lesion is not demonstrated by radiography or ultrasonography.
- 4) The Fellow Candidate will demonstrate competency in reading radiographic images relevant to surgical diseases where arthroscopy may be indicated.
- 5) The Fellow Candidate will demonstrate competence in the reading of CT images relevant to surgical diseases where it is the only modality that can provide ultimate information.
- 6) The Fellow Candidate will demonstrate a working competence and understanding of the reports of MRI scans done by a board certified radiologist, and in particular understanding the anatomical relevance prior to arthroscopic surgery.

## **Appendix 2**

### **ACVS MIS Fellow – Required Anesthesiology Rotation Learning Objective:**

#### **Small Animal Soft Tissue MIS Fellowship:**

- 1) The Fellow Candidate will demonstrate knowledge of anesthesia practices relevant to the management of laparoscopy and the use of pneumoperitoneum. The Fellow Candidate will demonstrate knowledge of anesthesia practices relevant to the management of thoracoscopy.
- 2) The Fellow Candidate will demonstrate knowledge of the effect of positioning during MIS procedures on anesthesia.
- 3) The Fellow Candidate will demonstrate knowledge of the impact of MIS on cardiovascular and pulmonary function.
- 4) The Fellow Candidate will demonstrate knowledge of the risk associated with different gas for creation of pneumoperitoneum: CO<sub>2</sub>, helium and air.
- 5) The Fellow Candidate will demonstrate knowledge of the risk of gas embolism associated with laparoscopy.
- 6) The Fellow Candidate will be competent in the correct placement of endobronchial blockers, double-lumen endobronchial tubes and the technique of selective intubation.
- 7) The Fellow Candidate will demonstrate knowledge of the impact of insufflation during thoracoscopy.
- 8) The Fellow Candidate will demonstrate knowledge of positive end expiratory pressure on visualization and pulmonary function during thoracoscopy.
- 9) The Fellow Candidate will be competent in troubleshooting complications arising from the anesthetic management of laparoscopic and thoracoscopic techniques. The Fellow Candidate will need to understand the impact of those complications on the decision for conversion.

#### **Large Animal Soft Tissue MIS Fellowship**

- 1) The Fellow Candidate will demonstrate knowledge of anesthesia practices relevant to the management of laparoscopy and the use of pneumoperitoneum.
- 2) The Fellow Candidate will demonstrate knowledge of anesthesia practices relevant to positioning during laparoscopy (standing).

- 3) The Fellow Candidate will demonstrate knowledge of anesthesia practices relevant to the management of thoracoscopy.
- 4) The Fellow Candidate will be competent in troubleshooting complications arising from the anesthetic management of laparoscopic and thoracoscopic techniques. The Fellow Candidate will need to understand the impact of those complications on the decision for conversion.

#### **Small Animal Orthopedics MIS Fellowship**

- 1) The Fellow Candidate will demonstrate knowledge of anesthesia practices relevant to the management of patients receiving arthroscopic or minimally invasive fracture fixation.
- 2) The Fellow Candidate will demonstrate knowledge of intra-articular analgesia.
- 3) The Fellow Candidate will be competent in troubleshooting complications arising from the anesthetic management of arthroscopic or minimally invasive fracture fixation.

#### **Large Animal Orthopedics MIS Fellowship**

- 1) The Fellow Candidate will demonstrate knowledge of anesthesia practices relevant to the management of patients receiving arthroscopy, minimally invasive fracture fixation, tenoscopy or bursoscopy.
- 2) The Fellow Candidate will demonstrate knowledge of intra-articular analgesia.
- 3) The fellow will be competent in troubleshooting complications arising from the anesthetic management of arthroscopy, minimally invasive fracture fixation, tenoscopy or bursoscopy.

### Appendix 3

#### ACVS MIS Fellowship Case Log Category Requirements:

#### Small Animal Soft Tissue MIS Case Log Requirements:

##### **Laparoscopy: 40 cases total (30 supervised by MIS Fellow or Founding Fellow)**

The Fellow Candidate will be exposed to the Veress needle and the Hasson techniques for creation of pneumoperitoneum. Also experience with single incision laparoscopic surgery (SILS) will be required.

**30 basic procedures** (20 supervised by MIS Fellow or Founding Fellow; with regular cannulas and with SILS port or similar port)

Ovariectomy or ovariohysterectomy (max of 10)

Laparoscopically assisted Gastropexy

Laparoscopic assisted cystotomy

Laparoscopic assisted GI surgery (not biopsy)

**10 advanced cases** (All supervised by MIS Fellow or Founding Fellow)

Laparoscopic Gastropexy

Cholecystectomy

Adrenalectomy

Nephrectomy

Splenectomy

##### **Thoracoscopy: 20 cases total** (15 supervised by a MIS Fellow or Founding Fellow)

Pericardial window

Cranial mediastinal mass

Persistent right aortic arches

Lung lobectomy (minimum of 2 lobectomies using one lung ventilation; Fellow under supervision)

#### Large Animal Soft Tissue MIS Case Log Requirements:

##### **Laparoscopy: 30 cases total** (25 supervised by MIS Fellow or Founding Fellow)

The Fellow Candidate will be exposed to commonly used methods for creation of pneumoperitoneum including: Veress needle, Hasson, and teat cannula.

**25 basic procedures** (20 supervised by MIS Fellow or Founding Fellow)

Ovariectomy (max of 15)

Cryptorchid Castration (max of 10)

Adhesiolysis

Liver biopsy

Abdominal Exploratory

Post Castration hemorrhage

**5 advanced cases** (All supervised by MIS Fellow or Founding Fellow)

Nephrosplenic space ablation

Epiploric foramen closure

Inguinal hernia repair

Umbilical/Incisional hernia repair

Laparoscopic assisted cystotomy

Ruptured bladder repair

Uteropexy

Nephrectomy

**Thoracoscopy**: not required but can be used for 2 of the advanced cases.

### **Small Animal Orthopedic MIS Case Log Requirements:**

**Arthroscopy**: 100 cases total (50 supervised by MIS Fellow or Founding Fellow)

**75 basic procedures** (25 supervised by MIS Fellow or Founding Fellow):

Shoulder arthroscopy (minimum of 10)

(e.g. joint exploration, OCD treatment, hanging leg shoulder arthroscopy)

Elbow arthroscopy (minimum of 20)

(e.g. joint exploration, FCP removal, coronoid process debridement, OCD treatment)

Stifle arthroscopy (minimum of 30)

(e.g. joint exploration, ACL debridement, meniscal probe, partial medial meniscectomy, OCD treatment)

**25 advanced procedures** (All supervised by MIS Fellow or Founding Fellow):

Shoulder arthroscopy:

Examples: biceps tendon release, caudal glenoid fragment, MGHL diagnosis and treatment, subcapularis

tendon diagnosis and treatment, use of craniomedial scope portal

Elbow arthroscopy:

Examples: BURP, OCD removal/treatment, subtotal coronoidectomy, UAP diagnosis and treatment, microfracture, subtotal synovectomy, etc

Stifle arthroscopy:

Examples: complex medial and lateral meniscal tears resection, meniscal repair, meniscal release, OCD treatment, medial retinacular release for MPL, PCL tear

Carpal arthroscopy (minimum of 1)

Hip arthroscopy (minimum of 1)

Tarsal arthroscopy (minimum of 1)

MIS cranial cruciate repair (minimum of 5)

Arthroscopic partial meniscectomy (minimum of 5)

**MIS Fracture Repair and Arthrodesis: 30 cases total** (15 supervised by MIS Fellow or Founding Fellow)

**20 basic procedures** (5 supervised by MIS Fellow or Founding Fellow)

(candidate must use a minimum of 3 applications of the following implant systems- bone plate, plate-rod, external fixator)

Humeral fracture

Radius and Ulna fracture

Femur fracture

Tibial fracture

**10 advanced cases** (All supervised by MIS Fellow or Founding Fellow)

Humeral fracture

Radius and Ulna Fracture

Femur Fracture

Tibial Fracture

MC/MT fracture

Articular fracture

(e.g. supraglenoid tuberosity, unicondylar elbow fracture, slab fractures, chip fractures)

Percutaneous pinning

Arthrodesis

SI luxation

## Large Animal Orthopedic MIS Case Log Requirements:

### **75 Basic Procedures** (45 supervised by MIS Fellow or Founding Fellow)

70 arthroscopic surgery of:

Middle carpal joint for osteochondral fragmentation (10 minimum)

Antebrachio-carpal joint for osteochondral fragmentation (10 minimum)

Dorsal pouch of fetlock joint for:

osteochondral fragmentation of proximal dorsal P1(10 minimum)

treatment of synovial pad fibrotic proliferation (villonodular synovitis) (5 minimum)

OCD fragments of sagittal ridge of distal metacarpus/metatarsus (3 minimum)

Shoulder (2 minimum)

Distal interphalangeal joint (3 minimum)

Femoropatellar joint for OCD (5 minimum)

Tarsocrural joint for OCD (10 minimum)

1. Arthroscopic surgery of the DIRT (minimum of 4)

2. Arthroscopic surgery of the LTR of talus (minimum of 3)

3. Arthroscopic surgery of the medial malleolus (minimum of 3)

Tarsocrural joint (dorsolateral approach) for treatment of fracture of lateral malleolus (1 minimum)

Plantar pouch of tarsocrural joint (1 minimum)

5 Tenoscopic surgery of:

Carpal canal for osteochondroma (3 minimum)

Carpal canal for superior check desmotomy (2 minimum)

### **60 Advanced Procedures** (All supervised by MIS Fellow or Founding Fellow)

50 Arthroscopic surgery of:

Carpus for lag screw fixation of slab fractures (8 minimum)

1. Frontal fracture of radial facet of 3<sup>rd</sup> carpal bone (3 minimum)

2. Frontal fractures of both radial & intermediate facets of 3<sup>rd</sup> carpal bone (3 minimum)



- 3. Sagittal slab fracture of 3<sup>rd</sup> carpal bone (2 minimum)
- Palmar carpal pouch for osteochondral fragmentation (2 minimum)
- Palmar fetlock pouch for palmar/plantar P1 fragmentation (4 minimum)
- Palmar fetlock pouch for sesamoid fragmentation (9 minimum)
  - 1. Apical fragments (3 minimum)
  - 2. Abaxial fragments (3 minimum)
  - 3. Basal sesamoid fragments (3 minimum)
- Palmar fetlock pouch for internal fixation of midbody sesamoid fracture (1 minimum)
- Fetlock joint with lag screw fixation lateral condylar fracture of metacarpus/metatarsus (6 minimum)
  - 1. Undisplaced (3 minimum)
  - 2. Displaced (3 minimum)
- Lag screw fixation of sagittal P1 fracture (2 minimum)
- Elbow joint (2 minimum)
- Dorsal pouch of proximal interphalangeal joint (3 minimum)
- Palmar pouch of proximal interphalangeal joint (1 minimum)
- Femorotibial joint (12 minimum)
  - 1. Lesions of medial femoral condyle (5 minimum)
  - 2. Lesions of meniscus or meniscal ligaments (4 minimum)
  - 3. Caudal pouch of medial femorotibial joint (3 minimum)
- 7 Tenoscopic surgeries of:
  - Digital flexor tendon sheath (4 minimum)
  - Carpal canal for retinacular release (1 minimum)
  - Navicular bursa for non-septic DDF tendonitis via digital tendon sheath (2 minimum)
- 3 Bursoscopy (other than navicular bursa) (3 minimum)