Equine Diagnostic Imaging
Proposal for Provisional Recognition – Recognized Veterinary Specialty
Outline

I. History and Progress of Equine Diagnostic Imaging
    i. History prior to Specialty Organizing Committee (LADIS)
    ii. History of the Specialty Organizing Committee

II. Organizational Structure of Equine Diagnostic Imaging Specialty
    i. Constitution and Bylaws
        i. Name
        ii. Objectives
        iii. Membership
        iv. Requirements for Certifying Examination in Equine Diagnostic Imaging
        v. Officers
        vi. Administration
        vii. Dues and Fees
        viii. Discipline
        ix. Conduct of Business
        x. Amendments
        xi. Procedure for the Appeal of Adverse Decisions by the Specialty of Equine Diagnostic Imaging
        xii. Financial and Legal Obligations

III. Fulfillment of Requirements for a Recognized Veterinary Specialty
        i. Equine Diagnostic Imaging as a Distinct and Identifiable Specialty
            a. Scientific Basis
            b. Equine Diagnostic Imaging Related to Professional/Postgraduate Curriculum
            c. Anticipated Impact of Equine Diagnostic Imaging in Multiple Venues
                1. Diplomates in Public, Institutional and Private Practice
                2. Relationships and Commonalities to other RVSOs
                3. Why Equine Diagnostic Imaging is suitable for an RVS
    ii. Improved Services Offered to the Public
    iii. Potential Diplomates

IV. Candidate Education and Qualification
    i. Admission to a EDI training program
    ii. Terminology of Training Programs
    iii. Qualifications of Training Supervision
    iv. Training Goals
    v. Specialty Training Pathways
        i. Full-time Residency Training Program
        ii. Alternate Residency Training Program
    vi. Specialty Training Requirements
        i. Annual Report

ii. Training in Surgery, Sports Medicine and Lameness and Internal Medicine
iii. Publication Requirements
iv. Case Load for Each Imaging Modality

V. Examination Procedure and Polices
i. Nature and Scope of the Board Examination
i. Preliminary Examination
ii. Certifying Examination
ii. Examination Fee
iii. Establish the Pass Point
iv. Grading the Examination
v. Reporting Result to the Candidates
i. Pass/Fail Report
ii. Examination Deficiencies to Unsuccessful Candidates
vi. Avoiding Conflict of Interest
vii. Disabilities, Illness and other Health Issues

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I. History and Progress of Equine Diagnostic Imaging
i. X-ray (radiology) examination of horses was implemented in the early 19th century following the advent of x-ray technology. The need for specialization in veterinary radiology was recognized in the mid and late 1950s, and the American Board of Veterinary Radiology, later renamed as the American College of Veterinary Radiology, was established in 1961. Precursor organizations to the American College of Veterinary Radiology were the Veterinary Radiology Society and Educators in Veterinary Radiology. These societies provided early collaboration between veterinarians interested in radiology and those with expertise, exclusively at educational institutions. These organizations were dissolved sometime after the formation of ACVR.

Recognized residency training programs were established following the founding of ACVR. The residency programs approved by ACVR provided diagnostic imaging training in all animal species. Radiology, and to a limited degree fluoroscopy and scintigraphy, were the imaging modalities available at the time ACVR was established. In the 1960s and 1970s, the case load for equine imaging and the ACVR examination were approximately 30% equine oriented. Today, equine imaging comprises less than 20% of most ACVR residency training programs and the subsequent certifying examination. The Society of Large Animal Diagnostic Imaging was formed as subsection within ACVR in 2011 to all the collaboration of radiologists and other veterinary professionals with an interest in large animal

imaging in an effort further education, research and development in large animal diagnostic imaging.

Equine Diagnostic Imaging literature has grown dramatically since the inception of ACVR. In the 1960s, the only textbooks Equine Diagnostic Imaging sections were *Veterinary Radiology* by William Carlson and *Equine Lameness* by Robert Adams. More recent textbooks with dedicated Equine Diagnostic Imaging sections include; *Equine Radiography* by Morgan, Neeves and Baker; *The Equine Distal Limb – An Atlas of Clinical Anatomy and Comparative Imaging* by Denoix; *Clinical Radiology of the Horse* by Butler, Colles, Dyson, Kold and Poulos; *Lameness in Horses* by Adams and Stashak; *Advances in Equine Imaging, Veterinary Clinics of North America*: *Equine Practice* by Werpy and Barrett and the *Textbook of Veterinary Diagnostic Radiology* by Thrall.

With the expansion and development of diagnostic imaging modalities; ultrasound, computed tomography, magnetic resonance imaging, positron emission tomography, digital radiography, picture archiving and communications systems (PACs), the amount of knowledge and training needed in veterinary diagnostic imaging has dramatically increased. Due to the advancements in imaging modalities available, current general imaging training programs recognized by ACVR do not provide adequate depth and breadth of training in Equine Diagnostic Imaging. There are only a few radiologists with comprehensive expertise in equine imaging creating an ongoing separation between equine radiologists and large animal clinicians, sports medicine specialists, internal medicine specialists and large animal surgeons.

Residents selected to ACVR approved training programs generally have an interest in either small or large animal diagnostic imaging. Those individuals interested in equine diagnostic imaging feel their training focuses heavily on small animal imaging limiting their training in equine diagnostic imaging. Many individuals with an interest in equine diagnostic imaging do not apply for ACVR approved residency programs because of the heavily-weighted small animal training and, as a result, enter sports medicine and sports surgery residencies. Due to the vast knowledge base and intricacies of Equine Diagnostic Imaging, the specialty has outgrown the traditional residency training program and is in need of becoming its own Recognized Veterinary Specialty.

ii. The organizing committee was established with individuals who have or are working extensively in Equine Diagnostic Imaging. This includes experience in academia, private practice and teleradiology. The individuals have had experience in research and publications related to equine imaging and have teaching experience in training residents and veterinary students as well as continuing education. The expertise of these individuals will provide the basis for developing strong residency training programs in Equine Diagnostic Imaging as a Recognized Veterinary Specialty under the American College of Veterinary Radiology.

II. Organizational Structure of Equine Diagnostic Imaging Specialty American College of Veterinary Radiology Recognized Veterinary Specialty of Equine Diagnostic Imaging By-Laws

ARTICLE I – Name

Section 1 The name of this organization shall be the American College of Veterinary Radiology, Recognized Veterinary Specialty of Equine Diagnostic Imaging, hereinafter referred.

ARTICLE II – Objectives

Section 1To encourage the development of teaching personnel and training facilities in Equine Diagnostic Imaging.

Section 2 To consolidate the equine diagnostic imaging effort thereby providing an atmosphere conducive to mutual enhancement of the quality of equine diagnostic imaging service and training.

Section 3 To guard against incompetence in the practice of Equine Diagnostic Imaging by conducting investigations and examinations to determine the competence of voluntary candidates for certificates issued by the American College of Veterinary Radiology, hereinafter referred to as the "College."

Section 4To confer certification upon candidates who have successfully demonstrated their proficiency in the field of Equine Diagnostic Imaging.

Section 5 To establish minimum standards for training programs in the field of Equine Diagnostic Imaging.

Section 6 To advise veterinarians who desire certification in the field of Equine Diagnostic Imaging as to the course of study and training to be pursued.

Section 7 To establish the minimum standard for the practice of Equine Diagnostic Imaging through collective evaluation of the Specialty of Equine Diagnostic Imaging by the Diplomates.

ARTICLE III – Membership

Section 1 The membership of the ACVR-EDI shall consist of: Founding Members, Active Diplomates, Emeritus Diplomate, Retired Diplomate, Resident Member In-Training. Qualifications for the various types of memberships are based on the Constitution of the College and requirements of the American Board of Veterinary Specialties (ABVS). Only Diplomates may attend the ACVR-EDI business meeting.

Section 2 The definition and qualifications for membership shall be:

i. Founding members: Founding members in Equine Diagnostic Imaging will be those who have not passed the examination, but have contributed to the specialty on the organizing committee. Membership will only be available for three years from the date of inception of ACVR-EDI. Founding members on the original examination committee will have 3 years after rotating off the examination committee to sit for and pass the board examination. Founding members who do not pass the examination in this time frame will not be awarded diplomate status.

ii.

iii. Diplomates of ACVR who meet two or more of the criteria set forth by the ACVR Constitution Article V will be eligible to sit for the ACVR-EDI board examination:

i. Be a professor of any level or clinical instructor of diagnostic imaging in a college, school, or department of veterinary medicine with an active equine diagnostic imaging caseload.

ii. Have ten (10) years of experience in the specialty, and by teaching, research or practice, have demonstrated competence in and contributed significantly to the development of the specialty of equine diagnostic imaging.

iii. Be a first or senior author of two or more peer-reviewed publications resulting from research or practice in the specialty.

iv. Have advanced training in equine diagnostic imaging and have demonstrated competency through teaching, research or practice in the specialty to which the individual devotes most of his or her professional time.

iv. Resident member in training in an approved residency training program.

i. To be designated a ACVR-EDI Diplomates, resident members in training must pass both the ACVR preliminary exam and the ACVR-EDI certifying examination.

ii. Founding membership will only be available for three years from the date of inception of ACVR-EDI. Qualified ACVR-Diplomates must pass the ACVR-EDI certifying examination to be designated as Diplomates of ACVR-EDI. Founding members who are not part of the exam committee will be eligible to sit the ACVR-EDI exam within 3 years of the establishment of the ACVR-EDI. If a Founding member is a part of the ACVR-EDI examination committee, then they will be eligible to sit the exam within 2 years after their service to the Examination Committee ends. Founding members can serve no more than 3 years on the original examination committee.

iii. To be designated a ACVR-EDI Diplomate, resident members in training must pass both the ACVR-EDI preliminary exam and the ACVR-EDI certifying examination.

iv. Refer to Article V of the ACVR Constitution regarding definitions for Diplomate (Active or Inactive), Emeritus Diplomate, Retired Diplomate, and Resident Member-in-Training.

v. To remain Active, a Diplomate must:

i) Register and attend at least one annual meeting of the ACVR-EDI every 3 years. Written request for dispensation, both prospective and retroactive within the same calendar year, may be approved by majority vote of Executive Council. Granted dispensation is applicable only for one (1) year.

ii) Remit, within 60 days of the due date, annual dues according to Article IV, Section 1 and 2 of the ByLaws.

iii) Diplomates must comply with the Maintenance of Certification requirements established by Executive Council in accordance with the Maintenance of

Certification Policy and Procedures document provided by the ACVR.

iv) Any Diplomate, Active or Inactive, whose certificate expires will no longer be considered a Diplomate by ACVR.

v) Specialized training opportunities will be implemented and encouraged by the ACVR-EDI to maintain professional expertise and advancemen

ARTICLE IV – Requirements for Certifying Examination in Equine Diagnostic Imaging

Section 1 The general requirements for any candidate to be eligible for the certifying examination in Equine Diagnostic Imaging are listed in Article VI of the Constitution of the College.

Section 2 An eligible candidate must:

i. Have completed prior to the certification exam of the examination year, a supervised full-time residency training program approved by Executive Council, consisting of a minimum of thirty-six months. The supervisor of the program must be an active Diplomate of the Specialty of Equine Diagnostic Imaging.

ii. Or have completed prior to the certification exam of the examination year, an alternative training program which is judged by the Specialty of Equine Diagnostic Imaging Residency Standards & Evaluation Committee and the Executive Council of the College, hereinafter referred to as the Executive Council, to be comparable to that listed in paragraph (i.) above.

iii. Current Diplomates of the ACVR who meet the criteria listed in Article III, Section 2. This will be an available method for certification for the first three years of the specialty

iv. Founding members will of the ACVR-EDI will be eligible to sit the certifying examination within the first 3 years of the specialty or 3 years after the end of service on the examination committee, as outlined in Article III, section iv.

v. All programs (paragraphs (i.) and (ii.) above) must be submitted for evaluation and approval to the Executive Council of the College every 6 months, with submission of the application to take the certifying exam received no later than September 1 of the preceding year in which the candidate wishes to take the examination.

vi. Candidates will be informed of final credential decisions at least 120 days prior to the examination date

vii. Candidates whose credentials are denied and file an appeal will be notified of the appeal decision at least 45 days before the examination date.

Section 3 Examination Requirements

i. The candidate must satisfactorily pass all sections of the examination. The examination cut-off point will be determined in the same manner as the current ACVR examination.

ii. A candidate failing only one section may retake that one section during one of the next 2 test periods. The candidate will be allowed one attempt to retake and pass the

re-examination within the allowed period. Should the candidate fail the re-examination or elect not to undergo re-examination within the allowed period, then he/she must retake the entire examination within the allowed period, then he/she must retake the entire examination. Candidates failing more than one section of the examination are required to retake the entire examination. Candidates will be limited to 3 retake examinations.

Section 4 Examination Content

i. The examination will be an in-depth examination involving detailed principles of equine diagnostic imaging. Candidates will be provided a content outline and have knowledge of the exam format prior to the examination.

ii. The candidate would be expected to exhibit in-depth knowledge of equine diagnostic imaging and related areas; pathophysiology; radiation safety; imaging (radiography, ultrasonography, nuclear scintigraphy, computed tomography, and magnetic resonance); radiation physics; basic principles of equine sports medicine (understanding of equine athletic disciplines, lameness, diagnostic analgesia, dentistry, cardiology, rehabilitation).

iii. Particular emphasis will be placed on the assessment of images, relevance of lesions relative to the clinical examination and diagnostic analgesia findings, multimodality imaging and appropriate modality selection, and ultrasonographic skills, including interventional procedures. The candidate could be presented with case-histories and diagnostics of patients presented for imaging evaluation. Diagnostic images and subsequent imaging-based treatment plans may be presented.

iv. The exam may include a technical component, including a hands-on live ultrasound examination.

v. In the initial three years, the preliminary exam will be the same as currently used by the ACVR and Diplomates who have previously passed the written examination will only be required to take the equine specific Certifying examination. After three years, examination content will include question contribution with references from Founding members, current ACVR-EDI Diplomates and the questions used in conjunction with the ACVR-preliminary examination. Questions will be reviewed and analyzed by the exam committee for appropriateness and difficulty using the Angoff method.

ARTICLE V – Officers

Section 1 The officers of the Specialty of Equine Diagnostic Imaging shall consist of the following: President, President-Elect, Past President, Treasurer and Secretary.

Section 2 The financial matters of the Specialty of Equine Diagnostic Imaging will be handled by the Treasurer of the College.

Section 3 The President, President-Elect and Secretary of the Specialty of Equine Diagnostic Imaging shall be Diplomates of the Specialty of Equine Diagnostic Imaging elected by a

majority vote of the eligible Diplomates of the Specialty of Equine Diagnostic Imaging at the called meeting of the Specialty Diagnostic Imaging Using secret ballots.

Section 4 The President and President-Elect will serve two (2) year terms, with the President-Elect becoming President after two (2) years or sooner if the office of President becomes vacant. The Secretary shall serve a five (5) year term unless a successor has been elected to fill a vacancy of the of the office. The Past-President shall serve a two-year of office.

Section 5 Nomination for all vacancies shall be made by a committee of three (3) Diplomates Specialty of Equine Diagnostic Imaging. Additional nominations may be made in open meeting or by notification of the nomination committee by any Diplomate, Specialty of Equine Diagnostic Imaging in good standing. Should vacancies in any office occur, the Executive Council may at its discretion, initiate the usual nomination and election procedures to fill the vacancy for the unexpired part of the term.

Section 6 Duties of the President and President-Elect:

i. The President shall preside over all meetings of the Specialty of Equine Diagnostic Imaging and shall be an ex-officio member of all committees, and shall perform the usual duties of such office.
ii. The President shall be a full voting member of the Executive Council.
iii. The President-Elect shall be an ex-officio member of all committees, shall preside at the meetings in the absence of the President, and shall succeed to the office of the President should that office be vacated.

Section 7 Duties of the Past President: The Past President shall serve the Specialty of Equine Diagnostic Imaging as assigned by the President.

Section 8 Duties of the Secretary: The Secretary shall serve as an executive officer of the Specialty of Equine Diagnostic Imaging and shall be responsible for the keeping of minutes at all meetings; shall perform the usual duties of a secretary; and shall perform other duties assigned by the President.

ARTICLE VI - Administration

Section 1 The Specialty of Equine Diagnostic Imaging will adhere to the Constitution of the College.

Section 2 The general management and business of the organization shall be vested in the Executive Council.

Section 3 The President of the Specialty of Equine Diagnostic Imaging shall be a full voting member of the Executive Council.

Section 4 Representation of the Specialty of Equine Diagnostic Imaging on the American Board of Veterinary Specialties is by the representative of the ACVR.

Section 5 Activities of the Specialty of Equine Diagnostic Imaging are reported to the American Board of Veterinary Specialties within the required reports of the ACVR.

ARTICLE VII – Dues and Fees

Section 1 All changes in the amount of annual dues shall be recommended by a simple majority vote of the Executive Council and be approved by a simple majority of the membership attending the annual meeting of the Specialty of Equine Diagnostic Imaging. The annual dues include a yearly subscription to "VETERINARY RADIOLOGY & ULTRASOUND" and membership in the International Veterinary Radiology Association and may also include additional dues directed for the benefit of the Specialty of Equine Diagnostic Imaging. Dues are payable each year to the Treasurer of the College by the due date established by the Executive Council.

Section 2 A Diplomate, Specialty of Equine Diagnostic Imaging shall be judged in arrears if his/her dues are not paid within 60 days of the due date and he/she has been so notified in writing.

Section 3 Fees connected with examination and certification of candidates shall be determined by the Executive Council.

ARTICLE VIII – Discipline

Section 1 The Executive Council shall have authority to recommend censure of any Diplomate, Specialty of Equine Diagnostic Imaging for cause.

Section 2 If any Diplomate, Specialty of Equine Diagnostic Imaging has reason to believe that by unethical conduct, fraud, or for any reason any other Diplomate, Specialty of Equine Diagnostic Imaging has brought discredit upon the College, he/she present his/her changes in writing to the Executive Council. If the charges are considered sufficiently serious to warrant action, the accused Diplomate shall be notified by the Executive Council in writing by registered mail of the details of all charges brought against him/her. He/She shall have full opportunity to reply in writing or to appear before the Executive Council in person and face his/her accuser.

Section 3 The Executive Council shall weigh the evidence and by majority vote may recommend public reprimand. Such reprimand shall be published only after being sustained by majority vote of members of the Specialty Equine Diagnostic Imaging.

ARTICLE IX - Conduct of Business

Section 1 Quorum

i. A quorum of the Specialty of Equine Diagnostic Imaging shall consist of fifty percent of Diplomates eligible to vote.

ii. A regular annual meeting of the Specialty of Equine Diagnostic Imaging shall be called by the President. This will be in conjunction with the annual meeting of the College.

iii. Special meetings of the Specialty of Equine Diagnostic Imaging shall be called by the President, subsequent to the approval of the Executive Council. Should the President fail to set a date for the regular meeting or for special meetings, the Executive Council by majority action, may set a date for such meetings.

Section 2 Suspension of By-Laws – The By-Laws may be suspended at any meeting by unanimous consent of all voting Diplomates present and voting when at least 60% of the Diplomate members are present.

Section 3 Rules of Order - Robert's rules of order, revised, shall govern the conduct of all meetings.

ARTICLE X – Amendments

Section 1 Proposed amendments to these By-Laws shall be signed by at least three active Diplomates of the Specialty of Equine Diagnostic Imaging and shall be submitted to the Executive Council for its recommendation.

Section 2 Written or printed notice setting forth the proposed amendments, together with the recommendation of the Executive Council shall be mailed to each Diplomate of the Specialty of Equine Diagnostic Imaging, within thirty (30) days of the meeting at which Executive Council recorded its recommendation.

Section 3 A ballot will accompany the notice of proposed amendments. Affirmative vote by at least 2/3 of the ballots is required for adoption of any amendment.

ARTICLE XI – Procedure for Appeal of Adverse Decisions by the Specialty of Equine Diagnostic Imaging

Section 1 Adverse decisions by the ACVR may include, but are not limited to: a. Denial of certification of an individual. b. Denial of examination application acceptance. c. Denial of approval of a residency program. d. Denial of privilege to vote or hold office.

Section 2 In the event of an adverse decision by ACVR, ACVR shall advise the affected party of the procedure for appealing the adverse decision. The affected party is responsible for all his or her expenses incurred during the appeal process and, if necessary, mediation procedures. An affected party desiring to appeal the ACVR's adverse decision must adhere to the following procedure:

a. Grounds for Reconsideration or Review: 1. The affected party may petition for reconsideration or review of the ACVR's decision on the grounds that the ACVR has ruled erroneously by: a). disregarding the established ACVR criteria for certification b). failing to follow its stated procedures or c). failing to consider relevant evidence and documentation presented.

b. Petition for Reconsideration: 1. An affected party may, at his or her option, petition ACVR-EDI to reconsider its decision by filing with ACVR- a written petition for reconsideration which shall include a statement of the grounds for reconsideration and documentation, if any, in support of the petition. 2. Such petition must be received in the ACVR office within 90 days of the date on which ACVR-EDI announces its adverse decision. 3. Upon receipt of such a petition, the ACVR-EDI President will appoint an ad hoc committee to review the petition. This committee will comprise at least 3, and no more than 5, ACVR-EDI Active Diplomates who are not at the time of the petition members of the Executive Council, Examination Committee, or Residency Standards and Evaluation Committee. 4. The ad hoc committee will meet within 60 days of its formation to review the petition for reconsideration of an adverse decision. The affected party may, at his or her option, elect to appear at this meeting. 5. The ad hoc committee will reach a final decision and this decision will be delivered in writing by mail to the ACVR-EDI President and the affected party not more than 30 days after it is made. 6. Upon the completion of steps (1) through

(5) above, if the affected party is not satisfied with the final decision, he or she may request mediation. A professional mediator that is agreeable to both parties will carry out mediation. Both parties will equally share the cost of the mediator.

ARTICLE XII – Financial and Legal Obligations

Section 1 Incorporation, financial and legal obligations of Equine Diagnostic Imaging are administered through the ACVR

Section 2 ACVR-EDI will avoid contracts and agreements leading to activities outside the scope of the stated objectives of the organization.

III. Fulfillment of Requirements for a Recognized Veterinary Specialty

i. Equine Diagnostic Imaging as a Distinct and Identifiable Specialty

a. Scientific Basis

Since 1961, the American College of Veterinary Radiology (ACVR) began training students and residents in the field of diagnostic imaging, providing guidelines for training programs and overseeing radiology facilities in universities and private practice settings. The ACVR has historically been involved in the acquisition and assessment of imaging from all species, although the most common clinical patients are dogs, cats and horses . Due to the high volume of small animal cases, the residency programs and thus the certifying examinations have focused on dogs and cats, with only a small focus on equine imaging. With the number of imaging modalities now available in veterinary medicine and increased use of advanced imaging modalities, this leaves even less time to learn and become competent in equine imaging during the short span of a residency (3-4 years). Additionally, due to the relatively small amount of training provided in equine imaging through many residency programs, numerous boarded radiologists are not willing or capable to provide equine image interpretation, ultrasound assessment or perform interventional procedures.

Given the wealth of knowledge required for each species and distinct differences in pathophysiology, anatomy and physiology, many specialty colleges have separated into large and small animal (or species-specific) specialties. Although imaging physics and basic imaging interpretation principles can be applied to most animals, species differences need to be understood for proper image interpretation, relevant differential diagnoses and further recommendations. The structure and function of equine anatomy, especially musculoskeletal anatomy, is quite different from carnivore anatomy and an in-depth understanding of these differences is vital to image assessment. The amount of research being performed in equine imaging makes keeping up with the current literature challenging, even for those focused on equine imaging.

Additionally, knowledge of the differences between the equestrian sports/disciplines is essential to determining the significance of imaging findings in the equine athlete.

Compared to companion animal imaging, equine imaging has unique requirements in restraint/handling for the imaging examinations, different safety issues, and different equipment needs, especially for imaging larger body parts such as the spine. These needs require specialized training and equipment.
Although diagnostic imaging is a core subject in the veterinary curriculum, most veterinary students only receive basic instruction in equine radiographic acquisition, radiographic interpretation, and ultrasound imaging during their veterinary education. Exposure to advanced imaging interpretation, including assessment of advanced imaging modalities (i.e. CT, MRI), is often only sporadically included in veterinary school, . Many equine practitioners rely on brief continuing education courses, self-instruction and clinical experience to become more familiar with imaging in equine practice. However, many imaging modalities, especially a user-dependent modality such as ultrasound, require dedicated training and frequent exposure for one to become capable and efficient. Therefore, with the limited number of equine radiologists, private practitioners and other equine specialists are frequently left to obtain and interpret images of all modalities, often without proper advanced training or guidance from a radiologist. The proposed Equine Diagnostic Imaging Specialty seeks to address this deficiency in equine practice, strengthening the role of the radiologist within equine practice, with the aim to provide more consistent support to the equine practitioner and ultimately better care for the equine patient.

b. Equine Diagnostic Imaging Related to Professional/Postgraduate Curriculum

Multiple textbooks, book chapters and peer-reviewed research articles have been published specifically on equine imaging. The amount of published literature has substantially increased in the area of equine imaging in the past 20 years, due to increased use of advanced imaging and the ability to better understand disease processes and the correlation between clinical symptoms and imaging findings. Included in this petition is a graph of published literature focused on equine imaging found on PubMed from 1990-2016 (Appendix A). Funding sources for equine imagine research include, but are not limited to: NIH, AQHA, Grayson Jockey Club, Morris Animal Foundation, AAEP, ACVR, ACVS, university intramural funding. Equine imaging research articles are frequently published in the following veterinary journals: Veterinary Radiology & Ultrasound, Equine Veterinary Journal, Veterinary Surgery, Journal of the American Veterinary Medical Association, Equine Veterinary Education, The Veterinary Record, and the Veterinary Clinics of North America- Equine Practice.

c. Anticipated Impact of Equine Diagnostic Imaging in Multiple Venues

- Increased use of equine radiologists for equine-specific teleradiology services and consultation
- Academic positions will increase use of radiologists in institutions that previously were more likely to rely on surgeons, internists or other specialists for equine diagnostic imaging
- Increased presence of radiologists in continuing education and professional meetings for equine diagnostic imaging
- Improve equine clinician confidence in the use of a radiologist due to the specialty training in equine diagnostic imaging
- Hiring of equine radiologists on staff at larger equine referral hospitals.

i. Diplomates in Public, Institutional and Private Practice

1. We anticipate approximately 65% of diplomates to be employed in private clinical veterinary practice, telemedicine consultation and referral centers.
2. We anticipate approximately 35% of diplomates to be employed educational institutions such as colleges of veterinary medicine and veterinary medical teaching hospitals.
3. We anticipate nearly 100% of diplomates will participate in telemedicine consultation at least part time.

ii. Relationships and Commonalities to other RVSOs

1. Veterinary radiology requires expertise in multiple imaging modalities with diplomates trained in anatomy, embryology, neurology, physiology, pathophysiology, physics, radiation biology and safety, digital imaging, imaging artifacts, contrast procedures, ultrasonography, nuclear medicine, computed tomography, and magnetic resonance imaging. An equine radiologist would be required to be proficient in all of these areas.

   Diagnostic imaging plays a large role in all aspects of equine veterinary medicine. Radiographs of numerous joints and ultrasonographic examinations of major tendons and ligaments are often incorporated during evaluation of horses prior to purchase. Musculoskeletal injuries are common among equine athletes and are primarily diagnosed through imaging. Magnetic resonance imaging is becoming much more available and its use to evaluate musculoskeletal injuries has increased dramatically in the last 10 years. Similarly, computed tomography has become the diagnostic of choice for many for imaging the head and sinuses of horses. The increased availability of these modalities demands that appropriate studies are selected and accurately interpreted. Accurate diagnoses are crucial for case

management and rehabilitation, which are often time consuming and costly. Improperly acquired or insufficient images can lead to misdiagnoses and have legal ramifications for the practitioner.

Many equine orthopedic injuries are imaged by large animal veterinary surgeons, specialists in the college of veterinary sports medicine and general practitioners. Large animal surgeons have variable training in image acquisition and interpretation, much of which is taught to them by other veterinary surgeons. This training is limited to 40 hours of supervision by a veterinary radiologist and inherently lacks education in physics, radiation biology, contrast procedures and, often times, advanced imaging such as CT and MRI. Knowledge in these areas is crucial for correctly identifying and minimizing imaging artifacts, managing radiation safety among staff members, and optimizing the efficiency of imaging studies to minimize patient anesthesia and restraint.

Though initial programs are in their infancy, veterinary sports medicine residency programs will include more education in image interpretation and acquisition compared with veterinary surgery. Residents in this college are required to be supervised by a veterinary radiologist for 6 weeks throughout their training. Similar to surgery training programs, supervision by a veterinary radiologist is limited by time constraints and most programs inherently lack training in areas such as physics and radiation biology. Because of the understood importance of quality training in these areas, many current sports medicine training programs encourage additional time supervised by radiologists or require imaging internships prior to acceptance into a residency.

Internal medicine specialists in referral centers and veterinary teaching hospitals typically perform cardiovascular and abdominal ultrasonography, interpret thoracic radiographs as well as evaluate neurologic imaging studies, such as myelograms. Similar to other specialty programs, supervision by a veterinary radiologist is limited to approximately 40-80 hours during one’s training.

General practitioners perform numerous radiographic and ultrasonographic studies in their practices. However, due to the large breadth of information and limited time for all subjects, training in equine radiology is limited in many veterinary schools to approximately 5-10 didactic lectures. Training in equine ultrasonography and advanced imaging is not required in veterinary programs and it is not uncommon for students to have little to no experience in these areas upon graduation. Many general practitioners are self-taught

and seek additional training in these areas from continuing education courses. Insufficient training can lead to inappropriate studies, increased cost to clients, misdiagnoses and compromise patient care. Given the monetary value of equine athletes, expensive legal action can ensue following misinterpretation of pre-purchase images or misdiagnoses that negatively affect performance. This significant financial component increases practitioner liability.

The lack of specialists in the area of equine diagnostic imaging and the demand for continuing education in this field has led to the development of societies dedicated to further education in this area. The international society for equine locomotor pathology (ISELP) was formed to meet the demand for continued education in ultrasonography and radiology. These popular and in-depth courses provide exceptional education of equine anatomy and general ultrasonographic skills, however topics such as image optimization and minimizing artifacts, are not currently offered as part of these modules.

iii. Why Equine Diagnostic Imaging is suitable for an RVS

Veterinary radiology is a rapidly advancing specialty due to numerous technological advances and the advent of telemedicine. Radiology training programs, like general veterinary education, are not currently species specific. Requirements of radiology residency programs are heavily weighted to small animal species (dogs and cats). While there is some overlap between species, the majority of equine pathology, anatomy and injury is unique and requires additional training to be proficient. Most residents trained in radiology pursue careers in small animal imaging.

In small animal practice, there has been a large amount of growth in the use of veterinary radiologists. Many ultrasonographic studies are performed by a veterinary radiologists. Similarly, there is an ever increasing demand for radiographic, nuclear scintigraphic, CT and MRI studies to be interpreted by a veterinary radiologist either on-site or remotely. The current demand for small animal veterinary radiologists is greater than the supply and a recent push has been made to increase the number of residents trained. However, there are few veterinary radiologists specialized in equine to provide a comparable standard of care in this field. Because of the large demand for veterinary radiologists in small animal practice, many diplomates in veterinary radiology do not interpret equine studies beyond the small amount that is required during their residencies. In a 2017 survey of 99 ACVR diplomates, the majority of respondents (84%) only interpret equine cases 0-25% of the time. Fifty-six percent of the respondents are satisfied with

the low number of equine studies or would prefer few equine studies in their caseload. This has created a substantial void in the imaging interpretation capabilities for equine veterinary medicine. In fact, of the ACVR diplomates surveyed, 58% of the respondents who work in an institution where equine ultrasounds are performed state that equine ultrasounds are performed by a veterinary radiologist less than 25% of the time. (Jobs Analysis Appendix)

Historically, there have been no training programs focused on equine radiology and, therefore, out of necessity, current imaging procedures are commonly performed and interpreted by specialists in surgery, internal medicine, sports medicine and general practitioners. A 2017 survey of equine practitioners revealed that the majority of 130 respondents (70%) employ a board-certified radiologist for fewer than 25% of cases and, eighty-nine percent of respondents do not utilize a veterinary radiologist for ultrasound cases.

The training required to earn diplomate status in the American College of Veterinary Radiology is extensive and includes education in physics, radiation safety, anatomy, physiology and imaging technology. This training improves diagnoses through the ability to recommend the most appropriate imaging procedures, recognize image artifacts, optimize image quality, and decrease acquisition time. For instance, many thoracic, abdominal and cardiac ultrasonographic studies are currently performed by diplomates in equine internal medicine. Standard training programs in this specialty provide little to no education of ultrasound physics. This knowledge would not only enhance the quality of the study, but also improve the accuracy of velocity measurements crucial for evaluation of cardiac and vascular disease. In other instances, the knowledge obtained during radiology residencies is beneficial for determining when findings in radiographic and MRI studies represent pathology or are artifactual.
That all equine specialties require supervised training by a veterinary radiologist highlights the importance of this specialty in the equine veterinary industry. Veterinary radiologists trained specifically in equine diagnostic imaging will provide valuable knowledge and enhanced capabilities to these specialties ultimately improving patient care and equine veterinary medicine as a whole.

The small number of veterinary radiologists focused on equine imaging has been a hindrance to equine practitioners. Sixty-five percent of respondents in the above survey stated that availability of radiologists was a limitation when considering utilizing imaging services and forty-four percent considered lack of availability as the biggest limitation. Lack of equine focused training also contributes to the small number of studies for which

a radiologist is requested. Sixty-five percent of the respondents would be more likely to utilize a veterinary radiologist if he/she had completed training dedicated to equine imaging.

ii. Improved Services Offered to the Public

As an equine diagnostic imaging specialty grows, there will be more educational resources such as clinicians at veterinary teaching institutions and increased research dedicated to the field of equine imaging available for training veterinary students thereby enhancing the diagnostic capabilities of the new veterinary graduate.

Continuing education by equine radiologists will also be provided to help meet the demand by practitioners for additional education. Such continuing education programs will include radiographic safety and acquisition, utility of contrast procedures and case selection for advanced imaging.

Equine veterinary radiologists will possess the training and expertise that will be the standard by which other 'equine imagers' are held. The training programs will ensure that the highest quality radiologists will be providing services to the equine industry.

Consultation guiding decisions about appropriate imaging modalities, techniques for image acquisition, and alternate projections will lead to improved and timely diagnoses. Timely and accurate diagnoses will decrease client expense and enhance treatment success.

Increased involvement by equine radiologists in pre-purchase examinations and assessment of performance limiting injuries will decrease the risk of misdiagnoses and liability of the general practitioner.

Additional services will include remote access to consulting radiologists. Having completed standardized training programs, equine radiologists will provide consistency in interpretation of imaging studies. Such studies in which consistency will be improved include extensive pre-purchase radiographic examinations, ultrasonographic evaluations, nuclear scintigraphy, computed tomography and MRI examinations.

iii. Potential Diplomates

The members of the organizing committee are dedicated to establishing initial resident training programs and examinations. Seven of the members of the organizing committee are diplomates of the American College of Veterinary Radiology. Five of the organizing members are currently employed at academic institutions. All of the members of the organizing committee are currently or have recently trained residents in equine radiology at academic institutions.

The seven ACVR diplomates of the organizing committee will be responsible for creating the initial certifying examination and, therefore, will not be eligible to sit for the initial certifying examination. Once a new

examination committee and examination are established, members of the organizing committee will be eligible to sit the new examination and obtain Diplomate status after an appropriate waiting period.

Initial members will be crucial for establishing residency programs and training residents. Initial membership will be open to diplomates of the American College of Veterinary Radiology who meet required credentials and successfully pass the examination. Initial membership will not be open to those in other specialties. This initial open membership period will last a period of three years. There are currently 74 veterinary radiologists who are members of the large animal diagnostic imaging society (LADIS) (Appendix B). We anticipate approximately 20-25 of these veterinary radiologists will participate in the initial membership. After the initial three years, successful completion of an approved residency program will be required prior to examination.

Non-radiologists in other specialties who are recognized as experts in equine diagnostic imaging including in individual modalities (such as diagnostic ultrasound) and meet criteria through a scoring system based on caseload, related publications, and experience will be valuable resources for training residents. We anticipate approximately 20 individuals who are currently members of the ACVR-LADIS will be interested in participating in the early training programs. These individuals will not provide more than 25% of the training in an approved residency. With the inclusion of these non-radiologists, we believe there will be greater than 20 members to supervise training within the first three years.

We anticipate that initially the number of training programs will be limited to 2-3, with one resident trained in each program per year. With the expansion of the program, we anticipate the number of residencies offered to increase.

IV. Candidate Education and Qualification -- Admission to an ACVR-EDI training program

i. Admission to the EDI training program

1. The applicant must be of high ethical, moral and professional standing.
2. The applicant must be a veterinarian who has graduated from an accredited school of veterinary medicine, or be a graduate of an equivalent higher educational body recognized by the country of residence.
3. The applicant must be licensed or qualified to become licensed to practice veterinary medicine and surgery in his/her country of residence.
4. The applicant shall have spent a minimum of 1 year in an equine rotating internship in academia or private practice or in as an associate in general practice.

a. Admission details:

1. Admission determined by individual programs
2. Individual programs can advertise residency positions through the ACVR web site.

ii. Terminology of Training Programs

1. Residents are veterinarians who are registered in an ACVR-EDI approved specialty training program.
2. An applicant is a veterinarian who is applying for registration of a training program with EDI.
3. A veterinarian who has completed an EDI-approved training program will be a post-trainee.
4. Every Resident has a residency program director

iii. Qualifications of Training Supervision

1. Residency directors are responsible for administration and continuity of approved training programs. The residency directors must be ACVR EDI founding members or diplomates in good standing of the college. Residents must receive training by at least 2 members of the ACVR-EDI, with a minimum clinical commitment of 4 months by the non-primary mentor. The non-primary mentor can provide at least 50% of the 4 month minimum training via electronic means such as virtual rounds and digital conferencing.
2. Residents may also receive training from approved non-radiologists with expertise in equine imaging, to comprise no more that 25% of the total training in the program.

iv. Training Goals

1. The general aims of the recognized veterinary specialty in equine diagnostic imaging are:
    a. To provide detailed and advanced resident training in all modalities in equine diagnostic imaging
    b. To integrate understanding of equine disease processes and sports and discipline related injuries/abnormalities with imaging analysis
    c. To promote research and development in the field of equine imaging by board-certified equine radiologists
    d. To promote the highest level of acquisition and interpretation of equine diagnostic imaging and provide high quality imaging support to equine practitioners and clients

    Successful completion of the residency will provide the trainee with opportunities to pursue a career in private practice, both within a clinic setting or as an independent consultant and/or to enter academia for clinical service, teaching and research of equine diagnostic imaging. The scope of the program will allow for residents to be able to integrate an understanding of equine disease processes and treatment of the disease with the imaging findings to incorporate as a valuable member of the equine veterinary team.

2. The following is a list of skills, behavior and knowledge expected of the specialist
    a. Professional contacts and transfer of knowledge
    b. Clear, precise oral and written communication skills

c. Engage in critical thinking and analytical synthesis of information
d. Assign priorities to identified problems and develop differential diagnoses
e. Effective transfer of knowledge via imaging reports with the prioritization of diagnoses and clear communication of potential relevance, outcome and further steps
f. Continue to advance the field through development of clinical research, scientific activities and dissemination of knowledge with peers
g. Be familiar with current theories and principle of the specialty
h. Keep knowledge up to date by reading the current literature and attending appropriate continuing education
i. Maintain an understanding of current and ongoing events, advances, objectives and goals of the veterinary profession generally as well as the specialty of equine diagnostic imaging
j. Understand the role of the specialist in regards to peer relations, animals, animal welfare, clients and colleagues and safety.
k. Have the highest standards for skills and use of current equipment and technology
l. Self-confidence, self-criticism, and strong sense of professional and personal responsibility
m. Obtaining help for problems that lie outside the specialty
n. Keep updated on skills and technology and become proficient before applying to clinical practice
o. Recognize the limitations of the specialty and recognize the limitations of his/her individual skill and experience level
p. Engage in a collegial, interdisciplinary working relationship with other practitioners and specialists.
q. Practicing the specialty of equine diagnostic imaging in its different domains.

v. Specialty Training Pathways

i. Full-time Residency Training Program

1. The program shall offer a minimum of 3 years (36 months) of postdoctoral medical education in veterinary radiology, of which at least 30 months of training must be supervised clinical experience.
2. All programs will be approved by the ACVR-EDI Residency Standards and Evaluation Committee (RSEC) with re-approval/re-accredidation to occur every 3 years.
3. Programs will be required to provide RSEC with an update of the program annually
4. Direction and Supervision

a. Program Director: The program director, in addition to supervising and administering the training program in veterinary radiology, must also be actively involved in the training and instruction of residents.

The director must be a founding member or an active Diplomate of the ACVR-EDI and must contribute at least 50% clinical assignment to the training program to ensure adequate direction.

b. Faculty: The faculty in the program must be qualified in those areas in which they are assigned to instruct and supervise residents and must contribute sufficient time to the program to ensure adequate instruction.

A single faculty member must accept primary responsibility for training in each of the five core areas. Individual faculty members may assume primary responsibility and contribute to training in multiple areas, but a single individual must assume primary responsibility for each of the five training areas.

The individuals assuming primary responsibility for training in an area need not be Diplomates of the ACVR EDI if sufficient expertise can be documented.

Non-radiologists with ACVR-EDI recognized expertise in equine imaging can provide up to 25% of the residency training

Assigned areas of instructional responsibilities and an abbreviated CV (No more than 1 page) of each faculty member must be included that documents expertise in the area of primary training responsibility.

The faculty must be committed to the teaching of the residents and the time and effort they devote to the educational program must be documented.

The faculty of the program must include at least one Diplomates of the ACVR-EDI or one Diplomate from ACVR-EDI and one Diplomate or ECVDI-LA . If only one ACVR-EDI Diplomate is on the faculty of the program, an additional off-site ACVR-EDI Diplomate must provide at least 4 months of training via electronic training and outside rotations.

The faculty must also include two diplomates from the American College of Veterinary Pathology, American College of Veterinary Internal Medicine, and the American College of Veterinary Surgery (Large Animal). Alternatively, if only one American boarded diplomate in each of these specialities is present, a European boarded specialist is acceptable. The diplomates of the American College of Veterinary Pathology do not have to be onsite.

Inclusion of at least one diplomate of the American College of Veterinary Sports Medicine and Rehabilitation in the faculty is strongly encouraged but not required.

The number of residents in the program cannot exceed twice the number of ACVR-EDI Diplomates in the faculty.

5. Affiliation Agreement: When the resources of two or more institutions are to be utilized for the clinical education of a resident in veterinary radiology, letters of agreement must be provided.
6. Facilities: The program must provide adequate space, equipment, and other pertinent facilities to ensure an effective educational experience for residents in veterinary radiology. The resident must have access to a facility with on-site modern radiographic equipment, modern B-mode ultrasound, computed tomography, MRI and nuclear medicine with direct involvement of image acquisition. A minimum of three months is required for on-site experience with CT, MRI and nuclear medicine. Veterinary patients in the training facility(ies) must have regular on-site access to these modalities where residents can be expected to be involved in the acquisition and interpretation of such studies.
   Additional case exposure to the other core areas need not be on-site, but sufficient case interpretation of these modalities must be available to meet the requirements of the program.
7. Clinical Resources: The program in veterinary radiology must provide a sufficient volume and variety of equine patients for instruction. If caseload is low, organized teaching files in under-represented breeds or disciplines may be substituted. The imaging caseload of the program must be greater than 2,000 imaging studies[1] annually (see n. below), if the program is to be completed within the minimum 36 month period.
8. Training Content:
    a. The program must provide an adequate depth and breadth of clinical experience.
    b. Clinical rotations must be a directed educational process.
    c. Unsupervised clinical responsibility alone does not constitute a suitable educational experience.
    d. The resident must produce timely reports from the imaging caseload.
    e. The program must have sufficient infrastructure to have all imaging studies are available in printed or electronic form in a timely fashion (<48 hours).
    f. At least 90% of written reports generated by a resident must be reviewed and approved by at least one faculty member of the program.
    g. The clinical training must provide for supervised, progressive responsibility for interpretation and progressive responsibility for quality control of diagnostic studies, and must ensure that the supervised resident performs those procedures commonly accepted in all aspects of diagnostic imaging offered by the program.
    h. At a minimum, the time commitment for the core clinical training shall consist of at least 12 months in diagnostic radiology, at least 8 months in diagnostic ultrasound, and at least 6 months in nuclear medicine, computed tomography and MRI, regardless of the caseload of the institution. These are expected to be distributed throughout the 36 month training program.

i. The program must provide residents meaningful experience in MRI, CT, and nuclear medicine, even if one of these modalities is not available at the primary training site.
j. Clinical rotations may be scheduled concurrently, when facilities and caseload permit. If residents are assigned to multiple services simultaneously, the time credit is not additive. In other words, a resident involved in all of the large animal radiology, CT, and ultrasound cases for one month receives only a total of one month credit distributed between the service areas. In these situations, the appropriateness of the distribution is the discretion of the institution, but should reflect the relative time commitment of the resident.
k. Thus of the 30 months of required clinical training, 26 are prescribed (12 months radiology, 8 months ultrasound, 6 months nuclear medicine, CT and MRI). The unprescribed 4 months of required clinical training are to allow residents to gain either greater depth of clinical training in the prescribed areas or in unprescribed areas such as echocardiography.
l. Time spent away from the clinic on research projects is not considered clinical training and should be performed during the 6 months of off-clinics time.
m. During the 30 months of required clinical training, the full time equivalent commitment to clinical service is calculated based on the assumption the resident is involved in the interpretation of a minimum of 75% of all examinations presented to the service(s) to which they are assigned. The remainder of the 36 months of the residency program is to be dedicated to course work, other specialty rotations, self study, teaching assignments, research and vacations. Being involved in the interpretation means the resident must be present at the time the study is initially interpreted. Merely attending rounds or reviewing cases is not considered being involved with interpretation. A greater than 75% commitment still only counts as full time (not more than 100%).
n. It is expected that this amount of experience would result in the resident being involved in the interpretation of a minimum of approximately 4,000 radiographic studies(1) in equine radiology, a minimum of 1,000 studies in diagnostic ultrasounds, and a minimum of 150 nuclear medicine, 150 CT and 150 MRI imaging studies during the course of the entire program.
o. More than one resident can be involved with a single study but case reporting will only apply to a single resident.
p. Each resident must have supervised experience in basic interventional procedures, such as image guided biopsies or fine-needle aspirates, or ultrasound guided injections.
q. Pathology is considered the basis for radiologic and ultrasound diagnosis, and the resident must be given the opportunity to attend pathology rounds or have access to written pathology reports generated from the imaging case load. The resident should also have access to surgical findings and results

r. Formal didactic classes or organized self-study modules must be included in:
    A. Radiobiology
    B. The physics of diagnostic radiology, nuclear medicine, ultrasonography, CT, MRI
s. Formal courses, organized self-study modules or supervised practical experience must be included to provide the resident knowledge of the basic patterns of disease and principles of interpretation of disease in:
    A. Diagnostic imaging (radiology, ultrasound, nuclear scintigraphy, CT and MRI)
    B. Echocardiography
    C. Medical imaging physics
    D. Radiation biology
    E. Radiation safety
t. The radiologic education in different organ systems should provide the opportunity for residents to develop adequate knowledge regarding normal and pathologic anatomy and physiology, including the biologic and pharmacologic actions of materials administered to patients in diagnostic studies.
u. If an optional graduate degree is available in the program, the impact of the degree option must be explicitly stated. If the optional degree program dilutes the clinical experience below the 75% clinical commitment, during the first 36 months of the program it must be submitted as a separate alternative program.

9. Research Environment: The program should provide an environment in which a resident is encouraged to engage in investigative work with appropriate faculty supervision. These projects may take the form of basic research in research laboratories or an assimilation of well-analyzed clinical material or even the reporting of individual cases. Documentation of this environment should be made in the institution's application and indicated by published papers or scientific presentations by residents and/or clinical faculty. A first authored, hypothesis driven manuscript accepted for publication is required to qualify for diplomate status.
10. Educational Environment: The education in diagnostic radiology should occur in an environment which encourages the interchange of knowledge and experience among residents and staff in the program, as well as with residents in other major clinical specialties located in those institutions participating in the program.
    a. At least 12 Known Case Conferences must be provided annually.[2]
    b. Residents should be provided ample opportunity to present formal lectures. It is expected that each resident will prepare and present a minimum of 3 lectures or scientific presentations during the course of the residency training program.
11. Evaluation: The in-training evaluation of resident performance and progress must be documented every six months through appropriate techniques, including faculty appraisal, oral or written tests, or a combination of these.

12. Teaching File: A teaching file of images referable to all aspects of equine diagnostic imaging must be available for use by residents. This file should be indexed, coded, and currently maintained.
13. Conferences: Conferences and teaching rounds must be correlated and provide for progressive resident participation. These should be not only intradepartmental conferences, but should involve each major clinical department. They should be of sufficient frequency and include both residents and staff participation on a regular basis.
14. Literature Resources: The program shall provide a sufficient variety of journals, references, and resource materials pertinent to progressive levels of education in diagnostic radiology and associated fields, all of which should be immediately accessible for resident study. In addition, residents should have access to a general medical library.
15. Footnotes: [1]An imaging study is defined as a study of an anatomical area (e.g., thorax, abdomen, fetlock, stifle, etc.). Multiple examinations may be performed on a single patient. A heavy caseload cannot reduce the minimum time commitment; however, a low caseload may extend the actual time commitment beyond the minimum.
[2]In Known Case Conferences the faculty selects cases that the resident has never seen, and where the diagnosis/outcome has been unequivocally confirmed. These cases are then presented to the residents as unknowns. These conferences may take different forms, but they must be designed to test the progress of the resident's pattern recognition and medical decision making skills.

ii. Alternate Residency Training Program

1. Individuals not completing an ACVR-EDI Standard Radiology Residency Training Program may qualify to take the Board Certification Examination by completing an equivalent Alternative Radiology Residency Training Program sponsored by an ACVR-EDI Diplomate. The Alternative Training Program must meet requirements equivalent to those outlined in the EDI Radiology Residency Training Program Essentials, the Board Certification Examination Eligibility Requirements, and the ACVR-EDI Constitution.
2. ACVR-EDI does not warrant that successful completion of an ACVR Alternative Radiology Residency Training Program will lead to passage of the ACVR Radiology Board Certification Examination and/or achievement of ACVR Diplomate status.
3. The Alternative Training Program MUST be submitted by the sponsoring diplomate and approved in advance by the ACVR Radiology Residency Standards and Evaluation Committee (RSEC) and the ACVR Executive Council for an individual to be eligible to take the Radiology Board Certification Examination.
4. The Alternative Radiology Residency Program should be approved before the beginning of training. The application for the Alternative Radiology Residency Training Program should be submitted to the Residency Standards & Evaluation Committee (RSEC) Chair by August 1 of the first year of training by the sponsoring diplomate.
5. If approved by the RSEC, the ACVR Executive Council will review the application for final approval. According to the ACVR Constitution, the

Program MUST be submitted to Executive Council for approval by September 1 of the year, 2 years in advance of anticipated examination.

vi. Specialty Training Requirements

i. Annual Report

The in-training evaluation of resident performance and progress must be documented every 6 months through appropriate techniques, including faculty appraisal, oral or written tests, or a combination of these. The residency directors will confirm every 6 months that their listed residents have satisfactorily completed the previous 6 months of the residency program based on an internal review. This needs to be signed by the residency director and the resident and submitted to RSEC chair every 6 months.
If the resident has policy-based concerns, contact the Executive Director of the ACVR. All interpersonal conflicts need to be moderated by the institution's Human Resources Department.

Each resident in an alternative program would have to submit credentials to RSEC prior to being accepted as being qualified to take the board examination.

A survey will be given to each resident following completion of their program. The findings of this survey will be provided to the ACVR Council and RSEC committee members.

ii. Training in Surgery, Sports Medicine and Lameness and Internal Medicine

The ACVR-EDI will require residents to acquire 40 hours each of post-graduate training under the supervision of a board certified specialist in three separate rotations of 1) Equine Surgery and Lameness 2) Equine Sports Medicine and 3) Equine Internal Medicine and/or Cardiology. This time will be part of the 6 months that are available for off-clinic and elective time and can occur at an academic institution or private practice.

Activities related to Specialty Practice requirements must be logged by the resident. When a resident trains with a mentor that is board certified in two or more specialties, they may log a training week in only one of those specialties. During periods of mentoring for which the resident is logging immersion time, they may also log experience requirements or skills requirements when appropriate.

iii. Publication Requirements

The candidate must have at least one manuscript published or accepted for publication in the field of equine diagnostic imaging in order to be to eligible for diplomate status of ACVR-EDI. The following criteria must be fulfilled:

a. The research must be the result of the resident's work

b. The resident must be the primary investigator (first author)
c. The manuscript must follow a scientific approach, including a clearly stated hypothesis, material and methods, results and discussion. Review papers, case reports, book chapters, etc. do not meet the criteria.
d. The date of publication cannot be more than five years old by the deadline for credentials submission.
e. The manuscript must be published in a peer-reviewed journal

iv. Case Load for Each Imaging Modality

Documentation of total number of cases dictated in each modality in order to ensure the total number meets or exceeds the amount described in the training program and submitted yearly to the ACVR-EDI RSEC.

V. Examination Procedures and Policies

i. Nature and Scope of the Board Examination

The ACVR Examination in Diagnostic Imaging is a two-part examination composed of the Preliminary Examination and the Certifying Examination. A candidate must pass the Preliminary Examination according to the criteria set forth in this document in order to qualify to sit the Certifying Examination. A candidate who passes the Certifying Examination is eligible to become a Diplomate of the American College of Veterinary Radiology-Equine Diagnostic Imaging. Diplomate status is ultimately conferred by majority vote of the ACVR Executive Council.

To be eligible for examination and certification as an ACVR-EDI Diplomate, candidates must have training supervised for at least 50% of the time by at least 1 ACVR-EDI founding member or Diplomate and at least 25% training by another diplomate of the ACVR-EDI or ECVDI-LA. Training by ACVR-EDI recognized experts in equine diagnostic imaging will not exceed 25%. The training occurs in a program that meets the guidelines established by the Executive Council of the American College of Veterinary Radiology-Equine Diagnostic Imaging. Upon completion of a residency training program that meets established guidelines, the candidate should be qualified to apply for the certification examination.

To be eligible for the preliminary examination, residents must have completed 24 months of a residency program, with at least 20 months of clinical training. To be eligible for the certifying examination, residents must have completed 36 months of a residency program, with at least 30 months of clinical training. Upon completion of a residency training program that meets established guidelines, the candidate should be qualified to apply for the certification examination.

i. Preliminary Examination

For the initial three years, the preliminary examination will be the same exam that all ACVR trainees take and is composed of multiple-choice questions. All questions are based on physics of diagnostic imaging, anatomy, imaging anatomy, physiology of body systems and pathophysiology of disease processes. Images will be used in the examination and will include normal and abnormal cases. While there is no stated specific time limit regarding the literature, particularly for Veterinary Radiology & Ultrasound, outdated, obsolete, or obscure material is avoided.

Each new member of the examination committee should receive a copy of all questions currently in the item bank from the database maintained by the Examination Director. A conference call will be scheduled by the Chair for January of each year and will include the Examination Director to discuss any recommendations for the writing of the current years' examination. The examination is to be written in multiple-choice to allow for better determination of validity of questions . The member must write the expected answers for all questions and include at least one specific reference as well as the specific current objective that the question addresses. All questions in the referenced copies must list the date of their inclusion. The initial draft of the exam and the key must be sent to the Chair before March 1 of the exam year.

Any materials required for the examination (radiographs, etc.) should also be sent to the examination committee at this time. Upon receipt of the draft from the members, the Chair will collate the sections into complete examinations and distribute to all members of the committee and the Examination Director by April 15.

Members of the Examination Committee will provide the Chair with recommended changes in objectives for the following year's exam prior to that year's Spring Executive Council meeting.

All members of the examination committee and the examination director will critically review the entire examination including the answer key and references. After receiving the final copies of each section, the Chair is responsible for final review. The Chair will request alternative images if deemed unacceptable. Poor quality studies will not be used as part of the examination process. Cases should include a complete study that are considered a routine part of the examination of the particular part being imaged. The examination director will be responsible for making the appropriate number of copies of the exam and transporting them to examination location. The examination director will provide a form for candidates assigning an identifying number to use during the examination that will be kept confidential during the examination grading process. The Examination Director and Chair will be responsible for developing a grading sheet. The examination director will administer and proctor the written portion of examination.

ii. Certifying Examination

The certifying examination will cover the common imaging modalities (Radiography, US, MRI, CT, NM) and include 60 case based questions. The

cases will include anatomic regions including thorax, abdomen, axial and appendicular skeleton.

Examination Committee members choose the cases used for each section. Each examiner selects cases for their own section but may also provide cases for other sections, as can the Examination Chair and the Assistant Chair. Before being approved for final use, all cases, the expected responses and scoring criteria are reviewed by the entire examination committee for suitability.

Equine species will be used as the subject of an examination question. The examination is designed to test recognition of imaging signs, and pathological disease patterns in general (similar in any species). Candidates should expect that the cases used for the thoracic, abdominal and musculoskeletal sections will consist of multimodality imaging.

Candidates should be prepared to evaluate each case as if providing consultation to another veterinarian. Sufficient clinical information will be provided to evaluate each case. Examiners are listening for a systematic evaluation of the study, listing of pertinent imaging findings, and discussion of findings they believe are significant. Candidates should present a compilation of organized clinically relevant findings leading to an imaging diagnosis. This should be followed by an appropriate, ranked list of differential diagnoses if the imaging diagnosis is not specific. Minimal time should be devoted to describing normal structures. A strong understanding of the pathophysiology of observed abnormalities, and provide a rational justification for the use of any ancillary studies, views or special procedures is expected from the candidates. The pattern of discussion should convince the examiner that the candidate understands what can be concluded from the images. Though interaction between the examiner and candidate is limited, the examiner may ask for further clarification, description or elaboration of key anatomical, pathophysiological, or biomechanical issues. It is important that the examiner clearly understand the candidate's thought processes, prioritization, and conclusions.

iii. Examination Fee
    i. Examination fee will be determined yearly for the preliminary examination and for the certifying examination

iv. Establishing the pass point.
    i. This will be performed in conjunction with current ACVR standards and will be criterion based.
    ii. Candidates will be informed of the method of setting the passing point prior to the examination.

v. Grading the Examination

The Certifying Examination is a criterion-referenced examination. The philosophy of a criterion referenced examination is based on the concept that candidates are measured

against an absolute standard that represents critical skill and knowledge.

vi. Reporting Result to the Candidates

i. Pass/Fail Report
1. Candidates will receive results of the examination less than 45 days after the date of the examination
2. All candidates will receive notification of results the same day

ii. Examination Deficiencies to Unsuccessful Candidates
Failing candidates will receive a letter from the Chair of the Examination Committee detailing specific areas of weakness and strengths to aid in their preparation for the next examination. Candidates will be informed of their remaining elibibility and reapplications procedures

vii. Avoiding Conflict of Interest

Examiner committee members are permitted to participate in "known case- conference" or "mock-board" training sessions at their home institution with residents and post-trainees who currently are in training or previously trained at that institution. However, examiners are not permitted to administer known case-conference or mock-board examinations to outside residents or post-trainees outside of their home training institution.

Participation in specialized training courses offered at professional continuing education, outside institutions or scientific conferences (i.e. Nuclear Medicine short-course, ACVR Resident Forum) is permitted.

Examiners are not permitted to examine candidates from their home institution, or those with whom they have a significant prior training relationship. An alternate examiner, typically the Examination Chair, Assistant Examination Chair, or the Examination Director will administer any examination section in which an Examiner is required to recuse him/herself.

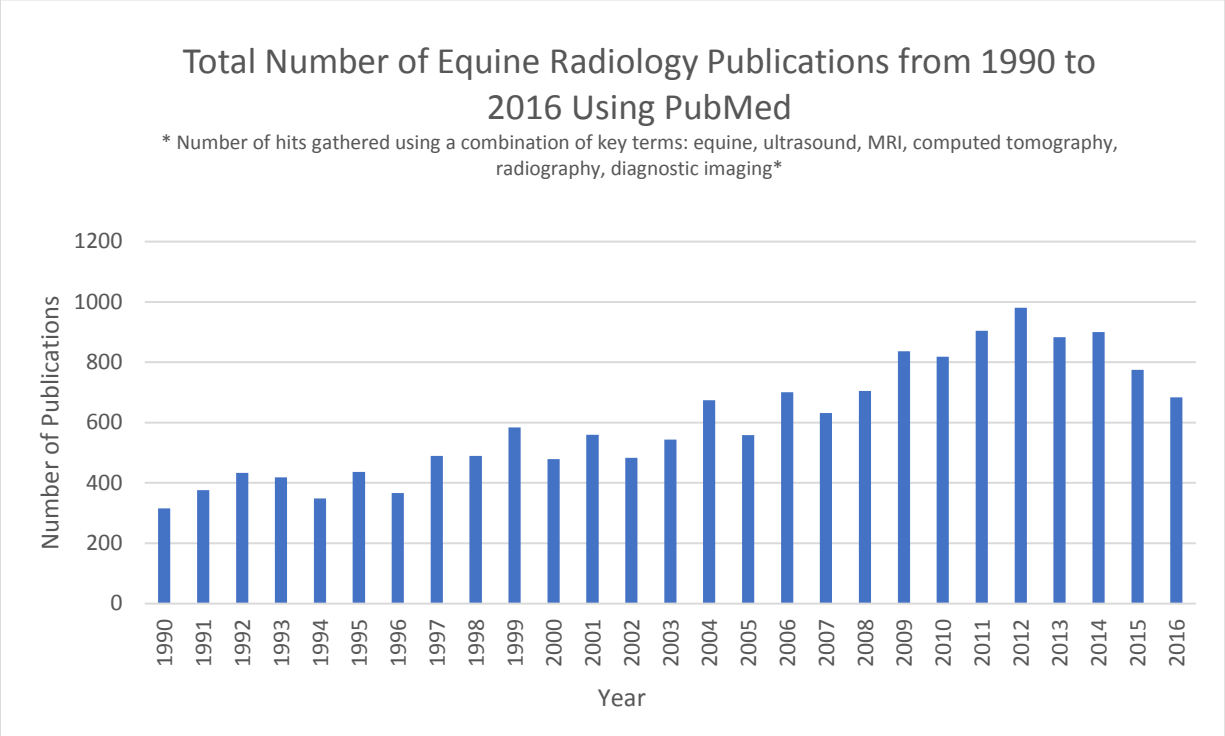
Examiners must not reveal any prior, current, or future examination content to candidates. Case examples previously used and already published on the ACVR website may be presented to candidates as part of training. Cases which might be submitted for consideration to the examination committee for use in the equine diagnostic examination should not be presented to candidates as part of a mock-board session. Conversely, cases presented to candidates in a mock-board examination format should not be submitted to the Examination Committee for use in the examination.

viii. Disabilities, Illness and other Health Issues

The equine diagnostic imaging exam committee will endeavor to accommodate disabilities or other health concerns in accordance with the American disabilities act that are made known to the exam to many prior to examination. Candidates shall send a completed request form and the physician's letter to the Examination Director using the disability combination request form is available in the examination of registered trainee page of the equine diagnostic imaging website. The exam committee with without legal counsel or expert will weigh the disability and how to best accommodate the disability or

health restriction.
A candidate suffering from an injury or illness that compromises the ability of the candidate to complete the examination in the period immediately preceding the examination is to notify the executive Council for exam chair prior to the examination. If illness or injury occurs during the examination the candidate is to notify the exam chair immediately. If illness or injury prevents obtaining from completing the examination circumstances will be reported to retractors may allow the candidate and additional attempt examination.

Appendix A



Year Increment Before 1990	PubMed Hits
1960-1969	325
1970-1979	1140
1980-1989	2205

Year	PubMed Hits
1990	316
1991	376
1992	433
1993	419
1994	349
1995	437
1996	367
1997	490
1998	490
1999	584
2000	479
2001	560
2002	483
2003	544

2004	674
2005	559
2006	701
2007	632
2008	705
2009	837
2010	818
2011	904
2012	981
2013	883
2014	900
2015	775
2016	684

Appendix B:

Current members of the ACVR Large Animal Diagnostic Imaging Society

Diplomates:

1.	Adrian, Anna	Cambridge	CAMUK	CB1 3QY
2.	Alexander, Kate	Lachine	QC	CAH8T3R2
3.	Bahr, Robert	Stillwater	OK	US 74074
4.	Barrett, Myra	Fort Collins	CO	US 80524
5.	Berry, Clifford	Gainesville	FL	US 32653
6.	Biscoe, Elizabeth	Argyle	TX	US 76226
		Irving	TX	US 75039
7.	Blevins, William	Otterbein	IN	US 47970
8.	Britt, Lisa	Columbia	MO	US 65202
9.	Castro, Fernando	Princeton	NJ	US 08540
		Tinton Falls	NJ	US 07724
10.	Chalmers, Heather	Guelph	ON	CAN1G 2W1
11.	Cissell, Derek	Davis	CA	US 95616
12.	Clapp, Kemba	Blacksburg	VA	US 24061
13.	Cole, Robert	Notasulga	AL	US 36866
14.	Cruz, Robert	Guelph	ON	CAN1G 5K2
15.	de Swarte, Marie	Knoxville	TN	US 37996

16. DeRouen, Anthony	Davis	CA	US 95616
17. Dimock, Abigail	Auburn	CA	US 95602
18. Dobson, Howard	Guelph	ON	CAN1G 2W1
19. Ellison, Michelle	Powder Springs	GA	US 30127
			US
20. Etue, Sheila	London	ON	CAN6J 2K2
	London	ON	CAN6G 5L1
21. Fischetti, Anthony	New York	NY	US 10065
22. Fontaine, Pascal	Philadelphia	PA	US 19104
23. Forrest, Lisa	Madison	WI	US 53706
24. Fox, Andrew	Wildomar	CA	US 92595
25. Garcia, Eric	Scotts Valley	CA	US 95066
26. Gibbons, Debra	Englewood	CO	US 80113
27. Gilmour, Lindsey	College Station	TX	US 77845
	College Station	TX	US 77843
28. Hartman, Angela	Upper Moutere	TAS	NZ7173
29. Hecht, Silke	Knoxville	TN	US 37996
30. Hoey, Seamus	Dublin	DB	IE 4
31. Holmes, Shannon	Athens	GA	US 30605
32. Hornof, William	Davis	CA	US 95616
33. Hostnik, Eric	Columbus	OH	US 43210
	Columbus	OH	US 43210
34. Kaser-Hotz, Barbara	Huenenberg	ZG	CHCH-6331
35. Kneller, S.	Mahomet	IL	US 61853
36. Larson, Martha	Blacksburg	VA	US 24061
37. Love, Nancy	Cary	NC	US 27511
38. Lustgarten, Meghann	Cary	NC	US 27513
39. Masseau, Isabelle	Saint-Hyacinthe	QC	CAJ2S 2M2
40. Mattoon, John	Pullman	WA	US 99163
41. McKnight, Alexia	Chadds Ford	PA	US 19317
42. McMurray, Alexis	Issaquah	WA	US 98027
	Issaquah	WA	US 98027
43. Miles, Kristina	Ames	IA	US 50011
44. Morandi, Federica	Knoxville	TN	US 37996
45. Morris, Earl	College Station	TX	US 77840
46. Neelis, Dana	Irving	TX	US 75039
	Irving	TX	US 75039
47. Nelson, Nathan	Cary	NC	US 27513
48. Neuwirth, Lisa	Paris	KY	US 40361
	Greater Lexington Area	KY	US

49. Nicoll, Robert	St Leonards	NSW	AU	2065
50. Nykamp, Stephanie	Guelph	ON	CAN	1G 2W1
51. Park, Richard	Fort Collins	CO	US	80525
52. Pease, Anthony	Las Vegas	NV	US	89120
53. Phillips, Kathryn	Esparto	CA	US	25627
54. Porter, Erin	Gainesville	FL	US	32608
	Alachua	FL	US	32615
55. Puchalski, Sarah	Petaluma	CA	US	94954
56. Rantanen, Norman	Fallbrook	CA	US	92088
57. Riedesel, Elizabeth	Ames	IA	US	50011
58. Roberts, Gregory	Pullman	WA	US	99164
59. Sande, Ronald	Elk River	ID	US	83827
60. Sato, Amy	North Grafton	MA	US	01536
61. Saveraid, Travis	St. Paul	MN	US	55104
62. Schkeeper, Amy	Columbus	OH	US	43210
63. Sippel, Kate	Houston	TX	US	77007
64. Spriet, Mathieu	Davis	CA	US	95616
	Davis	CA	US	95616
65. Suslak-Brown, Lisa	Media	PA	US	19063
66. Tanner, Jacqueline	MORAGA	CA	US	94556
		CA	US	
	Davis	CA	US	95616
67. Uerling, Megan	Houston	TX	US	77079
68. Waller, Kenneth	Madison	WI	US	53706
69. Watson, Elizabeth	Summerland Key	FL	US	33042
70. Werpy, Natasha	Archer	FL	US	32618
71. Wilkinson, Tom	Pullman	WA	US	99164
	Pullman	WA	US	99163
72. Winter, Matthew	Gainesville	FL	US	32610
73. Wulster, Kathryn	Kennett Square	PA	US	19348
	Kennett Square	PA	US	19348
74. Young, Alex	Sydney	NSW	AU	2029

Residents/Post-Trainees

1. Beaulieu, Alexandra	Rimouski	QC	CA	G5N1H1
2. Bruckner, Krista	Corvallis	OR	US	97330
3. Burke, Emily	Philadelphia	PA	US	19103
4. Childs, Bronwen	Athens	GA	US	30605
5. Doyle, Claire	Pullman	WA	US	99163
	Pullman	WA	US	99163

6. Emerson, Sue	Calgary	AB	CA	T4C 1P1
	Cochrane	AB	CA	T4C 1P1
7. Hanna, Ashley	Pullman	WA	US	99163
8. Hatfield, Jordan	Starkville	MS	US	39759
9. Kuzma, Carrie	Madison	WI	US	53719
10. Norvall, Amy	Davis	CA	US	95618
11. Paradise, Hayley	Baton Rouge	LA	US	70820
12. Seller, Stephanie	New York	NY	US	10022
	New York	NY	US	10065
13. Shields, Georgette	Fort Collins	CO	US	80526
14. Stewart, Nikia	Saint Paul	MN	US	55108
15. Wanamaker, Mason	Woodland	CA	US	95776
				14850
16. Whitty, Justin	Ithaca	NY	US	

1. Charles, Elizabeth	Murrieta	CA	US	92563
2. De Lasalle, Julie	Sainte-Madeleine	QC	CA	J0H 1S0
3. Giglio, Robson	Gainesville	FL	US	32608
4. Hoscheit, Larry	West Lafayette	IN	US	47906
5. Masciarelli, Amanda	North Andover	MA	US	01845
	Woburn	MA	US	01801
6. McCoy, Mary	Reddick	FL	US	32686
7. Melville, Lisa	Mount Crosby	QLD	AU	4306

Members Only

1. Schmidhalter Pekarkova, Marta	Praha 6			CZ 160 00
2. Ahlgrim, Holly	Vancouver	WA		US 98661
3. Armstrong, Warren	Puslinch	ON		CAN0B 2J0
4. Balducci, Jamie	Cary	NC		US 27511
5. Blankenship, Lee	Spring	TX		US 77388
6. Bolea, Nikki	Fountain HIlls	AZ		US 84268
7. Buff, Esco	Webster	NY		US 14580
8. Burdess, Chelsey	Whitehorse	YT		CAY1A0J1
9. Clausen, Gregory	Auburn	AL		US 36832
10. Cotter, Brad	Saskatoon	SK		CAS7H0J7
11. Edwards, Ryland	Newtown	CT		US 06470
12. Eitzer, Andrew	Madison	WI		US 53726
13. Engelhardt, Stephan	Dresden			DE 01099
14. Farwell, Victoria	Gilbert	IA		US 50105
15. Flanagan, Brandi	Decatur	GA		US 30030

16.	Gardelle, Olivier	Niederglatt	ZH	CH8172
17.	Garrett, Emily	Washington	TX	US 77880
18.	Garrett, Katherine	Lexington	KY	US 40580
19.	Grainger, Chelsea	Blacksburg	VA	US 24060
20.	Gyure, Chelsea	Coral Springs	FL	US 33071
21.	Hamersky, Jack	Ames	IA	US 50014
22.	Hoaglund, Elizabeth	Fort Collins	CO	US 80526
23.	Hoffmann, Karon	Putney	NSW	AU2112
24.	Hohu, Kyle	New York	NY	US 10019
25.	Huguet, Elodie	Louisville	KY	US 40245
26.	Ingman, Jessica	Uppsala		SE 75007
27.	Ivey, Richard	Starkville	MS	US 39759
28.	Johnson, Laura	Philadelphia	PA	US 19143
		Philadelphia	PA	US 19143
29.	Johnson, Philippa	Ithaca	NY	US 14853
30.	Koester, Christopher	Lakeville	MN	US 55044
31.	Levy, Stella	Morristown	NJ	US 07960
32.	Lochhead, Tannis	Winnipeg	MB	CAR2N 0A2
33.	Logwood, Katherine	Washington	DC	US 20016
34.	Luder, Patric	Oberwil		CH4104
35.	Lukacs, Denise	Hollywood	FL	US 33021
36.	Lyle, Lindsay	Abington	MA	US 02351
37.	McAllister, Hester	Dublin	DB	IE 4
38.	McCormick, William	Middleburg	VA	US 20118
39.	McHaney, Anastasia	Manhattan	KS	US 66503
40.	Mitchell, Richard	Newtown	CT	US 06470
41.	Morgan, Jessica	Locke	NY	US 13092
42.	Morrison, Barret	Azle	TX	US 76020
43.	Natsuhori, Masahiro	Towada	Aomori	JP 034-8628
44.	Neal, Katherine	Pullman	WA	US 99163
45.	Neumann, Alex	Guelph	ON	CAN1G4S7
46.	Ohlerth, Stefanie	Zurich		CH8057
47.	Pauwels, Frederik	Palmerston North	MWT	NZ4410
48.	Pullen, Jaret	Charlotte	VT	US 05445
49.	Purcell, Kris	Gardnerville	NV	US 89460
50.	Radue, Peter	Mount Airy	MD	US 21771
51.	Reef, Virginia	Kennett Square	PA	US 19348
52.	Reiter, Rachel	Columbus	GA	US 31909
53.	Rivard, Benjamin	Denver	CO	US 80247
54.	Roth, Pepa	Corvallis	OR	US 97333

55. Silver, Michael	Stamford	CT	US 06902
56. Spangler, Sara	Pocatello	ID	US 83204
57. Stewart, Danielle	Truro	NB	CAB6L3C5
58. Thornton, Jill	Newtown	CT	US 06470
59. Tootell, Jo	Irvine	CA	US 92612
60. Trostle, Steve	Earlysville	VA	US 22936
61. Vaughan, Betsy	Davis	CA	US 95616
62. Vilaplana Grosso, Federico	West Lafayette	IN	US 47907
63. Villanueva, Sandra	Pearland	TX	US 77581
64. von Saldern, Cosima	Leichlingen		DE 42799
65. Walther, Mimmi	Ashland	OR	US 97520
66. Whitcomb, Mary	Davis	CA	US 95616
67. Yu, David	Shanghai		CN200335
68. Zavagno, David	Solon	OH	US 44139