World Aquatic Veterinary Medical Association

Certified Aquatic Veterinarian (CertAqV) Credentialing Program

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A WAVMA Member Program

Version 1.1 (February 2014)

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Background

The need for an adequate and well-trained aquatic veterinary workforce that provides services to the aquaculture and seafood producing industries, aquatic animal owners, private industries, government agencies and others has become a global imperative – particularly in light of increasing concerns for combatting disease, seafood safety, public health and other issues.

Because of their training in multiple species of animals and disciplines of medicine veterinarians are uniquely qualified to deal with most of these issues. However, many academic veterinary curricula around the world may not currently have a sufficient focus on aquatic veterinary medicine to fully prepare graduates for practices in aquatic veterinary medicine. Fortunately, there are numerous other educational opportunities for veterinary students and veterinarians to obtain the knowledge, skills and experience necessary to provide adequate aquatic veterinary services.

The WAVMA Aquatic Veterinarian Certification Program seeks to identify the core competency areas or subject matter needed to practice aquatic veterinary medicine, and to recognize those veterinarians that have acquired the necessary knowledge, skills and experience through a variety of sources.

It is **not** the intention of the WAVMA CertAqV Program to duplicate, supersede or replace the need for any aquatic veterinary courses, curricula or Board Certification programs in aquatic veterinary medicine. However, recognizing that developing veterinary school curricular, Board Certification and other education and credentialing programs are both complex tasks and will take many years to develop, the CertAqV Program is seen as one that supports and supplements current and future efforts to ensure an adequate and well-trained global aquatic veterinary workforce.

Program Administration

The WAVMA CertAqV Program is administered by the WAVMA Credentialing Committee, along with the assistance of other Certified WAVMA members who serve as mentors and adjudicators (see Appendix 1 for mentor and adjudicator responsibilities and CertAqV individuals).

The WAVMA Credentialing Committee will review the program at least annually and may revise the description and needs for any KSE Module or subject area, as necessary.

CertAqV Process

To be credentialed by WAVMA as a Certified Aquatic Veterinarian and utilize the CertAqV honorific, individuals must be a WAVMA member, have a veterinary degree from a nationally recognized veterinary school, college or university and have demonstrated general knowledge and competency in core subject areas noted below that are currently considered necessary to practice aquatic veterinary medicine. Students of a nationally recognized veterinary institution of higher education can register for the program, but will not be certified or entitled to utilize the CertAqV honorific until they graduate.

Individuals that desire to participate in the WAVMA CertAqV Credentialing Program are required to:

- Be a current member of the World Aquatic Veterinary Medical Association

- Register for the Program (application at www.wavma.org or contact the WAVMA Administrators).

- Identify a mentor to assist the registrant through the Program. The potential mentors would be any available WAVMA Certified Aquatic Veterinarians (see Appendix I).

- Provide the mentor with written evidence of satisfactory completion of each of the core Knowledge, Skills and Experience (KSE) subject areas.

- Petition the Credentialing Committee for recognition of completion of all KSE requirements after the mentor has approved the documentation.

Registration & Petitioning for CertAqV

Individuals wanting to participate in the WAVMA CertAqV Program will submit an application form along with a registration fee of US $250. The application for CertAqV will remain active for two years from the date of initial registration. If a candidate does not petition by providing the Credentialing Committee with the evidence of satisfactory completion of KSE requirements for all 9 subject areas within 2 years, the candidate will be required to submit a new application and fee. Once the applicant has worked with the mentor to produce the documents required to assess the applicant's KSE, the documentation will then be reviewed by at least two members of the Credentialing Committee to approve the petition for certification, or the committee may request further documentation from the applicant before approving the petition. The approved petition is then forwarded to the WAVMA Executive Board for issuing of the Certification.

CertAqV Re-certification & CEPD Requirements

The CertAqV credentials are limited to 5 years from the date of issuance. The certified veterinarian must submit a renewal form every 5 years along with a recertification fee of $50.00 US. To renew the CertAqV credentials, evidence of at least 50 credit hours of aquatic veterinary Continuing Education and Professional Development (CEPD) over 5 years is required (i.e. an average of 10 hours per year). Continued WAVMA membership is also a requirement to maintain the CertAqV status.

Mentors & Adjudicators

Individuals that have been awarded WAVMA CertAqV credentials may be available to serve as mentors to help guide new candidates through the CertAqV program (see Appendix 1 for a list of potential mentors).

At least two individuals awarded WAVMA CertAqV (but not the mentor) will serve as adjudicators to evaluate an individual applicant's petition for CertAqV and recommend certification or request additional information or documentation from the applicant to fulfill the certification requirements.

The Credentialing Committee members that have been awarded WAVMA CertAqV credentials will also be responsible for evaluating non-WAVMA courses and programs as suitable for CertAqV credit.

Core Knowledge, Skills & Experience (KSE) Requirements[1]

In order to be certified as a WAVMA Certified Aquatic Veterinarian (CertAqV), applicants will need to demonstrate the Knowledge, Skills and Experience (KSE) using WAVMA approved programs or processes. The participating candidate's KSE will include, but not be limited to the theory, clinical significance, and practical experience in the following areas that are *unique[2]* to aquatic mammals, amphibians, reptiles, finfish, crustaceans, or molluscs. CertAqV candidates are required to be familiar with, and be able to, describe the normal and abnormal aspects of each specific subject that are encountered in general aquatic veterinary practice, and know where to locate additional information on the subject. Each specific area is assigned a minimum number of KSE credits[3] needed in brackets [ ], for a total of at least 150 credits.

PRE-CLINICAL KSE:

1. Aquatic Environment and Life Support Systems [25 credits minimum]

Water quality includes all the physical, chemical and biological characteristics of water that regulates its suitability for the health of aquatic organisms and their ecosystem. Poor water quality is often the cause of morbidity and mortality in aquatic animals. Knowledge, skills and experience in this subject matter are critical for practicing aquatic veterinary medicine. Given the intimate relationship that aquatic organisms

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[1] The WAVMA Credentialing Committee is continuously refining specific details for each of these KSEs with the assistance of subject matter experts.

[2] *Unique* KSEs are those not acquired during a typical pre-veterinary or veterinary curriculum.

[3] KSE Credits are an estimated time (in hours) required to attain an adequate understanding of the subject matter.

have with the surrounding environment, a candidate should demonstrate thorough understanding of this environment.

Examples are:

- Chemical stressors and their effect on aquatic animal health/environment
  - Common chemical water quality abnormalities
  - Techniques for the assessment/monitoring of water quality parameters
  - Interpretation of water quality parameter results
  - Appropriate treatment of water quality abnormalities
  - Toxins and pollutants
  - Effects of medications and therapeutics on water quality

- Physical stressors in the aquatic environment and their effect on aquatic animal health/environment. Including: stocking density, improper husbandry/life-support system, tank/pond design, inter/intra-species aggression, handling and transport

- Biological stressors in the aquatic environment and their effects on aquatic animal health

- Species differences in regards to their water quality requirements

- Interaction of various species in the aquatic ecosystem and its effect on aquatic animal health

- Environmental factors that affect the development of disease

2. Taxonomy, Anatomy and Physiology [10 credits minimum]

Candidate should demonstrate knowledge, skills and experience necessary for the practice of aquatic veterinary medicine and surgery of the basic anatomy and physiology of major aquatic animal taxa.

Examples are:

- Taxonomic relationship of aquatic Phyla

- Scientific and common names of significant aquatic animal species

- Anatomy and physiology of organ systems including:
  - Musculoskeletal and integumentary
  - Digestive (gastrointestinal), nutritional physiology
  - Circulatory and Respiratory
  - Osmoregulatory and waste excretion
  - Reproductive and Endocrine
  - Reticuloendothelial and Immune
  - Nervous

3. Husbandry and Industries [25 credits minimum]

Candidate should demonstrate an understanding of the key industry sectors, economics, health issues and husbandry practices associated with the captive maintenance of aquatic animals (e.g., aquaculture, ornamental pet trade, public aquaria exhibits,) and with wild harvest of aquatic animals for food and pets.

Examples are:

- Aquaculture Industry – Food sector and Ornamental sector

- Wild Harvest – Food and Ornamental Sectors

- Public Aquaria and Zoo Aquatic Animal Exhibition

- Conservation/Resource management captive breeding programs

- Animal Handling Techniques

- Animal Holding System Design and General Management

- Collection, Transport, Acclimation

- Biosecurity/Quarantine

- Life-Support System Components, Function and Management

- Water Quality Assessment and Interpretation

- Nutrition and Feeding

- Record Keeping and Standard Operating Procedures

CLINICAL KSE:

4. Pathobiology and Epidemiology of Aquatic Animal Diseases [25 credits minimum]

Candidate should demonstrate an understanding of environmental conditions and pathogens that cause diseases in aquatic animals, the pathological changes that occur in the animals, and the clinical signs of important aquatic animal diseases in order to determine the cause of the disease and the course of action or treatment, and assess the risk of contagion.

Examples are:

- Disease identification, prevention, control, treatment, eradication decisions.

- Non-infectious diseases:
  o Nutritional deficiencies
  o Water quality/temperature abnormality
  o Toxicity
  o Traumatic injuries
  o Genetic disorders
  o Neoplasia

- Infectious diseases:
  o Viruses
  o Bacteria
  o Fungi

- Parasitic diseases:
  o Protozoa
  o Metazoa

- Epidemiology
- Biosecurity, pathogen exclusion or containment methods.

5. Diagnostics and Treatment of Aquatic Animal Diseases [25 credits minimum]

Candidate should demonstrate a good understanding of the diagnostic procedures and treatments, including fundamental theoretical knowledge, as well as practical experience with clinical and laboratory disease diagnosis and treatment of infectious diseases and pathological conditions.

Examples are:

- Principles of Laboratory Diagnosis:
  o Sample collection for laboratory examination
  o Proper shipment of samples for diagnostic purposes
  o Principles of sample custody
  o Quality Assurance and Quality Control (QA and QC)
  o Diagnosis of bacterial infections
  o Diagnosis of viral infections
  o Diagnosis of mycotic infections
  o Diagnosis of parasitic diseases
  o Diagnosis of neoplasia
  o Diagnosis of traumatic injuries
  o Diagnosis of toxicities

- Principles of Prophylaxis and Disease Control

- Therapeutics, Biologics, Vaccines and other treatment approaches

6. Clinical Veterinary Experience and Client Communications [25 credits minimum]

Candidate should demonstrate competency with basic clinical procedures, diagnostic tools and techniques, and with client or industry communication.

Examples are:

- Clinical Examination, including:
  - o Taking a case history adapted to aquatic animals (e.g., include water quality)
  - o Physical examination techniques
  - o Blood collection and analysis
  - o Examination of cytology & biopsy wet mounts
  - o Postmortem examination

- Sedation/Anesthesia

- Basic imaging techniques

- Basic surgical procedures

- Common therapeutic approaches

- General Case management

- Client Communications with aquarists, aquaculture producer/farmers, wild animal collectors, facility managers, exporter/importer/wholesaler, retailer and hobbyist/pet owners.

7. Public Health, Zoonotics and Seafood Safety [5 credits minimum]

Candidate should demonstrate knowledge of aquatic zoonotic diseases pertinent to their field of practice. Candidate should also demonstrate understanding of the role of the veterinarian in public health through education and knowledge of the food-chain and seafood safety methodology.

Examples are:

- The etiology, transmission, treatment and control of aquatic zoonotic diseases

- Benefits and disadvantages of aquatic animals in public health

- Food-chain practices and legislation pertinent to their locality (including methods used to ensure product safety from the source to the consumer).

8. Legislation, Regulations, and Policies [5 credits minimum]

Candidate should demonstrate a good understanding of the laws, regulations and policies that directly impact the practice of aquatic veterinary medicine in areas relevant to the candidate.

Examples are:

- International bodies and guidance, codes or standards that address aquatic animal health and welfare, public health and seafood safety

- National and state/provincial/local governmental authorities responsible for, and statutory and non-statutory legislation, regulations and/or policies

- National and state/provincial/local veterinary organizations, their policies and codes or principles of veterinary medical ethics

- Development of a regional, national, or international health plan that includes list of reportable diseases, certification, zoning, risk assessment, and quarantine.

9. Principles of Aquatic Animal Welfare [5 credits minimum]

Candidate should demonstrate knowledge of current issues related to aquatic animal welfare and an ability to assess the welfare status of key aquatic species.

Examples are:

- General topics in aquatic animal welfare that are of concern to aquaculture industry, ornamental industry and hobbyists, research, resource management, zoos and aquariums

- Key legislation, regulations, policies, and professional societies' statements about aquatic animal welfare.

- Humane handling and euthanasia methods of aquatic animal species associated with the fishing industry, wildlife, aquaculture, ornamental trade, zoos, public aquaria and research.

Assessing the Necessary KSEs

Individuals may attain WAVMA credit for the core CertAqV requirements through verification of the satisfactory completion of educational or training programs specifically focused on the above KSE subject areas. This education can be from academic training programs, lectures, seminars, self-study, publication or additional methods listed below, or from other relevant experiences of the candidate upon approval of the WAVMA Credentialing Committee.

The candidates will document the necessary KSEs obtained from their education and training by compiling a list of classes, lectures, education and other training or experience for assessment by their mentor. Once sufficient evidence of knowledge and skills in each subject area is compiled and reviewed by the candidate's mentor, it will be presented to members of the Credentialing Committee for review. If the committee determines that additional training or documentation is necessary, that information will be provided to the candidate to allow completion of the certification process. Candidates that provide complete documentation of sufficient knowledge, skills and experience will be certified as an Aquatic Veterinarian.

Candidates may obtain credit points from any combination of the educational sources listed below. This will help ensure that a wide variety of skills and experiences are obtained in each KSE subject area. A minimum of 150 credit points from the listed subject areas will be necessary for certification. A combination of KSEs obtained from the below educational sources to reach a minimum of 150 points will be adequate for certification, however, the minimum number of credit points must be met for each KSE subject area, as described in the KSE section.

A. Continuing Education and Professional Development (CEPD)

The candidate will receive 1 point per hour of CEPD toward certification requirements. CEPD must be in the field of aquatic veterinary medicine, and preferably from a WAVMA-approved CEPD program. A copy of the CEPD certificate and course information needs to be included in the certification documentation.

EXAMPLE: If a candidate received a total of 8 CEPD hours during a veterinary conference, the list of topics presented at the lectures is required. Given that a sum of CEPD hours may encompass more than one KSE subject area (e.g. Pathobiology or Aquatic Environment) the candidate should suggest the KSE subject areas to apply the CEPD credit to (e.g. 5 points to Pathobiology and 3 points to Aquatic Environment KSE subject area).

B. Academic Programs or Courses (University Level)

The candidate will receive 20 points per week of a of FULL-TIME (40 hours) clinical academic veterinary externship rotation in the field of aquatic veterinary medicine or for an extensive laboratory and lecture based course in an area of aquatic veterinary medicine. Shorter University based courses will be treated as CEPD (see above). The candidate's mentor will assist in evaluating the credit points for each program.

EXAMPLE: A 3-week full-time clinical rotation in any area of aquatic animal medicine during veterinary curriculum will provide a candidate with a total of 60 points. A copy of the syllabus and the number of points to be applied to each KSE subject area needs to be included in the documentation package.

A WAVMA recognized extensive course in aquatic animal medicine that involves lectures, diagnostic laboratory and clinical experience can earn up to 20 points per week of full-time courses. University courses such as the 4-week long AquaVet Program will provide 20 points per week.

Veterinary students performing externships in aquatic veterinary medicine while in Veterinary School will receive 20 points per week of full-time externships in aquariums or other programs of aquatic veterinary medicine.

C. Post-Veterinary Academic Training (University Degrees, Internships, Residencies, Board Certification & Other Programs)

The WAVMA Credentialing Committee will review the aquatic veterinary medicine relevance of post-veterinary academic degrees (MSc/PhD) and training information (Internship, Residency, Board Certification) provided by the candidate and the mentor will assist the candidate in determining the credit points based on the relevance of the program to fulfill the KSE subject area requirements. The candidate will need to provide a description on the KSE subject areas that were part of the post-veterinary academic training.

EXAMPLE: The candidate may receive up to 50 points for one year of full-time veterinary internship or residency in a public aquarium focused on aquatic animal medicine. The candidate may receive up to 75 points for completion of a Master's program with a focus on aquatic animal medicine. The candidate may receive up to 100 points for completion of a PhD program with a focus on aquatic animal medicine. The candidate may receive up to 100 points for board certification in a specialty area with significant focus on aquatic animal medicine.

D. Literature Self-Study and Online Education

One point will be given for each journal article read or online webinar watched. The journal article or program title and author will be listed in the candidate's documentation. Books or book chapters will be given points based on 1 point per book chapter, up to 10 points per book studied. List the book title, chapter and author in the appropriate KSE section of the documentation.

E. Clinical Experience & Case Logs

The WAVMA Credentialing Committee will review the candidate's clinical experience based on the candidate's written description of experiences in aquatic veterinary medicine, case logs or reports. A letter of reference from an employer, client or co-worker can be used as documentation for the candidate's clinical experience. The candidate will need to provide a description of the KSE subject areas that were part of their clinical experience. The candidate's mentor will assess the experience and help determine the appropriate KSE area. Written case reports describing the candidate's involvement with examining, diagnosing and treating an aquatic animal can also be used to obtain credit for clinical experience. Five credit points will be given for each case log or report.

EXAMPLE: The candidate was employed full-time in a private practice. Candidate presents a total of 5 clinical case reports to the WAVMA Credentialing Committee as part of the application. After review for acceptance, the candidate would receive 25 points for these case reports toward certification.

F. Publications & Presentations in Professional Meetings

The candidate will receive points for publication of peer-reviewed journal articles, reviews, case reports, books or book chapters, and oral presentations at professional meetings. The candidate will provide copies of publications to the WAVMA Credentialing Committee for evaluation. Publications will be given 5 points per published article, review, or case report; 10 points per published peer-reviewed journal article, or for editing a multi-author book or writing a book chapter; and up to 40 points for authoring a complete aquatic medicine related book.

Professional presentations will be given 1 point per 15 minutes for brief presentation times, and 5 points per hour for longer presentations. Educators can use their teaching of classes related to aquatic veterinary medicine as professional presentation for credit (i.e., 5 points per hour for each unique lecture; repeating the lecture multiple times does not confer additional credits). Describe which KSE subject area each point would be attributed to in the credentialing documentation.

Summary of KSE Sources and their Credits

A. Continuing Education and Professional Development (CEPD) classes/lectures
Veterinary Conferences; University-based short courses
1 hour = 1 credit

B. Academic Programs or Courses (University Level)
Full-time clinical academic veterinary externship rotation
WAVMA recognized extensive course in aquatic animal medicine
2 class hours = 1 credit; or 20 points per week (e.g., 40 hour week = 20 credits)

C. Post-Veterinary Academic Training (Degrees, Internships, Residencies, Certification)
Intern/Residency= up to 50; MS=up to 75; PhD/Board Certification=up to 100 credits

D. Journal / Literature Self-Study and Online Education
Journal Article/Webcast lecture=1 credit; Book=1 credit/chapter up to 10 credits/book

E. Clinical Experience & Case Logs
Case Report =5 credits per case
Documentation/Letter of Clinical Experience=up to 50 credits (evaluate with mentor)

F. Publications & Presentations in Professional Meetings
Published article=5 credits; Published Peer-reviewed article=10 credits;
Published case report or review=5 credits
Editing a multi-author book=10 credits; Writing a Book Chapter=10;
Writing a Complete Book=10 per chapter up to 40 credits;
Short oral presentations at professional meetings=1 point per 15 minutes
Long oral presentations at professional meetings=5 points per lecture hour
Teaching University-level Academic classes=5 credits per lecture hour

Mentors & Adjudicators

Members of the Credentialing Committee will evaluate all applications for certification. A mentor will be assigned to the applicant, or one can be requested by the applicant. The mentor will review the applicant's KSE documentation and when it meets the minimum requirements it will be presented to the Credentialing Committee for adjudication by at least two other members. Once approved, the WAVMA Executive Board will be notified to confer the Certified Aquatic Veterinarian title to the applicant. On a periodic basis, certified individuals will also be asked to evaluate the Program and revise the description and needs for any KSE Module or subject area.

WAVMA Certified Aquatic Veterinarians (as of January 2014)

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