

CertAqV Resources

WAVMA Resources

www.wavma.org/WebCEPD

Resource: Webinars on various topics of around one hour

Cost: Available for free to WAVMA Members. To be registered for the CertAqVNT you need to be a member of WAVMA.

KSE Credit: Stated for each webinar. To gain the CPD /CEPD certificate you need to complete a short quiz.

Evidence: Submission of CEPD Certificate along with KSE record.

www.wavma.org/video-library

Resource: Video recordings deemed of good quality but not part of WebCEPD

Cost: Free to WAVMA members

KSE Credit: Variable, discuss/agree appropriate value with your mentor.

Evidence: None provided

WAVMA social media

WAVMA Facebook

WAVMA Twitter

WAVMA LinkedIn

Resource: Non-specific but links to various content and networking with others.

Comments: One of WAVMA's primary aims is to promote aquatic veterinary medicine. There are other resources WAVMA provides such as The Aquatic veterinarian, member listservs, e-news and blog.

Aquadocs

www.aquadocspodcast.com

Resource: Various discussion topics

Cost: Free

KSE Credit: Dependent on time and topic as well as mentor agreement

Evidence: None. Discuss with mentor

Comments: Lots of information on various topics of general use

<https://cafishvet.com/training/webinars/>

Resource: webinars provided by Dr. Jessie Sanders, DVM, CertAqV

Cost: Free

KSE Credit: Some are CE accredited but not all. May require advice from mentor as to what to claim

Evidence: Certificate if CE accredited

<https://cafishvet.com/training/fish-health-masterclass/>

Resource: Ornamental fish training course

Cost: \$99

KSE Credit: This is not CE accredited, amount to claim would be in discussion with your mentor?

Evidence: Record of time spent and topics covered, possibly certificate of completion?

Comments: Both are high quality resources

London Aquatic Veterinary Services

<https://londonaquaticvet.com/>

Useful information available on fish care. You will need a subscription to gain full access to all articles.

Just Exotics

www.justexotics.co.uk

Resource: various resources and courses for fish, amphibians, reptiles and birds

Cost: Free care sheets, Courses variable depending on length. Fee allows unlimited access for one year.

KSE Credit: Dependent on course length, one hour = 1KSE

Evidence: Certificate verifying time spent on completion.

Case Reports

Please see example case report on the [WAVMA CertAqVNT](#) webpage. This provides a template of what a good case report might look like.

Databases/TOC alerts for scientific papers

Pubmed: <https://pubmed.ncbi.nlm.nih.gov>

Science Direct: www.sciencedirect.com

CABI: www.cabi.org

www.academia.edu

www.researchgate.net

Comments: All are good databases to look for information. Academia and Researchgate provide free copies of papers.

Lafebervet

<https://lafeber.com/vet/>

Resource: Exotic animals – various content

Cost: variable

KSE Credit: variable, discuss with mentor

Evidence: Discuss with mentor

Comment: A comprehensive resource particularly for amphibians and reptiles?

Ornamental Aquatic trade Association

<https://ornamentalfish.org>

Resource: Loads of information regarding ornamental fish including several free publications (care sheets) and links to other resources. You can also access training materials.

Cost: Free except for training modules (<https://ornamentalfish.org/training>)

KSE Credit: Discuss with mentor – the advanced training modules should be worth one KSE per hour of study with proof being passing the exam (MCQ). Modules are available on Water Quality, Filtration, Fish Biology and Health. Note – you need to complete the training course in sequence. As guidance, each module completed and passed should be minimally worth 5 KSE.

Evidence: Variable, if completion of the training module, then certificate and/or screen shot of pass.

Comments: A lot of useful information regarding ornamental fish as well as **legislation** (EU and UK) on the website.

Fish Vet Masterclass (Freshwater)

<https://fishvetmasterclass.mykajabi.com>

Resources: See www.youtube.com/watch?v=Y3R13RKzwqU

Cost: \$599 USD

With over 90 lessons and access to the Fish Vet Masterclass Facebook Group for direct questions with Fish Vet Dr Richmond Loh. The course is designed for veterinarians and veterinary nurses, is a self-contained course and equips students with knowledge of how to recognise, diagnose and treat or manage fish diseases due to infectious and non-infectious causes.

KSE Credit: Agree with mentor, but potentially around 40-50 credits when completed.

Evidence: Certificate or screen shot.

The Aquarium Vet

www.theaquariumvet.com

Resource: online aquatics course aimed at vets, nurse/techs and professional aquarists

Cost: See website, can be per module rather than full course.

KSE Credit: Suggested by the website but basically one hour = one KSE.

Evidence: Certificate

Comments: Definitely a good resource and some of the modules are free (e.g. water quality).

The Fish Lab

<https://thefishlab.com>

Resource: Fish Behaviour, Ecology and Evolution. Links to other resources and scientific papers produced by the Dept. of Biological Science at Macquarie University, Australia

Cost: Free

KSE Credit: Discuss with mentor

Evidence: Discuss with mentor

Comments: One of several websites with useful resources particularly for fish welfare and shark research.

OATA Water Quality Criteria. (2008). [Online]. Available at: <https://www.ornamentalfish.org/wp-content/uploads/2012/08/Water-Quality-Criteria.pdf>

Videos

The Fish Vet – Dr Richmond Loh

www.youtube.com/user/TheFishVetDrLoh/videos

Resource: Short videos on various topics.

Cost: Free (except Fish Vetting)

KSE Credit: Discuss with mentor, basically one hour = one credit

Evidence: None

Comment: Most are pretty short but instructional. His 2014 Fish Vetting Techniques DVD was very good. The video is 1.5 hours long so worth 1.5 credits.

Dr Loh's two YouTube channels are:

Clinical case work ups: <http://tinyurl.com/thefishdoctor>

Veterinary techniques & miscellaneous: <https://youtube.com/@thefishvet>

VetFolio

www.vetfolio.com

Comment: Has a handful of articles and virtual courses in aquatics.

VSPN (Veterinary Support Personnel Network)

www.vin.com/VSPN

Resource: Various

Cost: Various

KSE Credit: Variable

Evidence: Discuss with mentor

Comments: Useful resource perhaps for someone writing an essay answer as part of the KSE?

World Organisation for Animal Health (formerly OIE)

www.woah.org

Resources: Numerous regarding international animal health but of particular interest for aquatic animal health (www.woah.org/en/what-we-do/animal-health-and-welfare/aquatic-animals), the Aquatic Animal Health Code and Manual (www.woah.org/en/what-we-do/standards/codes-and-manuals).

KSE Credit: Discuss with mentor

Evidence: Variable, discuss with mentor

Comment: A huge range of topics including One Health, welfare, legislation, and antimicrobial resistance.

Laboratory fish resources

MDIBL Health and colony management of laboratory fish: <https://mdibl.org/course/fish-health-2024/>

UAB zebrafish husbandry online:

<https://prostudies.uab.edu/search/publicCourseSearchDetails.do?method=load&courseId=4607518>

UAB zebrafish husbandry short course:

<https://prostudies.uab.edu/search/publicCourseSearchDetails.do?method=load&courseId=8109047>

Pain management in zebrafish : Report from a FELASA Working Group.

<https://pubmed.ncbi.nlm.nih.gov/38051824/>

Universities (Outreach)

University of Florida and in particular <https://ifas.ufl.edu>

University of Georgia <https://gacoast.uga.edu/outreach/>

University of Miami <https://aquaculture.earth.miami.edu/news-and-outreach/index.html>

USA Resources

U.S. Department of Agriculture has training modules for veterinarians that can be accessed online

www.aphis.usda.gov/aphis/ourfocus/animalhealth/nvap/ct_aast

Cost: Free

KSE Credit: Discuss with mentor

Evidence: None, possibly link to a case study?

Comment: They primarily cover legislation surrounding import/export and biosecurity concepts. As a technician you're unable to print a completion certificate because it requires a Veterinarian National Accreditation Number to do so.

CITI Program

<https://about.citiprogram.org/>

Cost: Variable

KSE Credit: Variable

Evidence: Completion certificate

Comment: It has training modules for fish (6 modules), amphibians (5 modules), and reptiles (6 modules) utilized in research settings which offer a nice comprehensive overview of each group. You may need an institutional affiliation to access.

American Veterinary Medical Association Guidelines for the Euthanasia of Animals

www.avma.org/resources-tools/avma-policies/avma-guidelines-euthanasia-animals

Cost: Free

KSE Credit: 1 credit?

Evidence: None

Comment: Part 1 reviews the concepts of euthanasia, Part 2 reviews euthanasia methods, Part 3 reviews techniques per species including an indication of acceptable, acceptable with conditions, and unacceptable.

- i. Page 64 for laboratory fish, amphibians, and reptiles
- ii. Pages 82-90 for fish and aquatic invertebrates
- iii. Pages 92-94 for captive amphibians and reptiles
- iv. Pages 96-97 for captive marine mammals
- v. Pages 99-100 for free-ranging marine mammals

Fish Welfare – open access resources

Tschirren, L., et al., (2021). MyFishCheck: A Model to Assess Fish Welfare in Aquaculture. Animals, 11, 145. <https://doi.org/10.3390/ani11010145>

Jerez-Cepa, I., & Ruiz-Jarabo, I. (2021). Physiology: An Important Tool to Assess the Welfare of Aquatic Animals. Biology, 10, 61. <https://doi.org/10.3390/biology10010061>

Reasons to Be Skeptical about Sentience and Pain in Fishes and Aquatic Invertebrates (2023) <https://www.tandfonline.com/doi/full/10.1080/23308249.2023.2257802>

Canadian National Farm Animal Care Council

Code of Practice for the Care and Handling of Farmed Salmonids (salmon, trout, charr) (2021) <https://www.nfacc.ca/codes-of-practice/farmed-salmonids>

The U.S. Animal Welfare Act and Animal Welfare Regulations

www.aphis.usda.gov/animal_welfare/downloads/AC_BlueBook_AWA_508_comp_version.pdf

Cost: Free

KSE Credit: Discuss with mentor

Evidence: None

Comment: Includes legislation that applies to marine mammals.

The U.S. Animal Welfare Regulations, Subpart E – Specifications for the Humane Handling, Care, Treatment, and Transportation of Marine Mammals

<https://www.ecfr.gov/current/title-9/chapter-I/subchapter-A/part-3/subpart-E>

Guide for the Care and Use of Laboratory Animals, 8th edition

www.ncbi.nlm.nih.gov/books/NBK54050/pdf/Bookshelf_NBK54050.pdf

Comment: Is a valuable resource for anyone working with free-ranging or captive specimens in research, teaching, or display.

Chapters 1 and 2 are recommended for those unfamiliar with animal use ethics, welfare concepts, and institutional program management.

Chapter 3, pages 77-88 cover aquatic environments and housing

Chapter 4 covers veterinary care guidelines

Chapter 5, pages 150-151 include a brief overview of construction features and considerations for aquatic species housing

Appendix A pages 178-179 include an additional reference list for environment, housing, and management of amphibians, reptiles, and fish

Appendix A pages 187-188 include an additional reference list for “other species”

Appendix A pages 192-193 include an additional reference list for veterinary care amphibians, reptiles, and fish

Appendix B U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training

Non-specific websites

Not necessarily related to aquatics but either provide specific documents that might be useful or some content that might be useful.

www.slideshare.net - has some aquatics related slide shows. You need to search by topic which might not necessarily be intuitive

https://www.epa.gov/sites/production/files/2015-09/documents/nitrification_1.pdf. Good document on nitrification in water.

Textbooks

- Bennet AR & Pye GF. 2022. *Surgery of Exotic Animals* 1st Edición. Wiley-Blackwell.
- Bossart GD. 2001. Manatees. Pages 939-960 in Dierauf LA, Gulland FMD (eds) *CRC Handbook of Marine Mammal Medicine*. CRC Press.
- Butterworth A (Ed). 2017. *Marine Mammal Welfare: Human Induced Change in the Marine Environment and Its Impacts on Marine Mammal Welfare* Springer Nature
- Carpenter, J. W., & Harms, C. (Eds.). (2022). *Exotic Animal Formulary-E-Book*. Elsevier Health Sciences.
- Chittick EJ, Walsh MT. 2014. Sirenians (Manatees and Dugongs). Pages 693-702 in West G, Heard D, Caulkett N (eds) *Zoo Animal and Wildlife Immobilization and Anesthesia*. Blackwell.
- Dierauf, Leslie; Gulland, Frances M. D. 2001. *CRC Handbook of Marine Mammal Medicine*, Chapter 30: Intensive Care (232---242), CRC Press.
- Duer ES & Gage LJ (Eds.). 2020. *Hand-Rearing Birds* Second Edition. Wiley-Blackwell.
- Gulland FM, Dierauf LA, & Whitman K L. (Eds.). 2018. *CRC handbook of marine mammal medicine*. CRC Press.
- Haddad Jr V. 2016. Medical emergencies caused by aquatic animals (pp. 35-85). Springer Nature. Switzerland: Springer International Publishing.
- Hadfield C & Clayton L (Eds.). 2021. *Clinical Guide to Fish Medicine* 1st Edición. Wiley-Blackwell.
- Hahn, A. (2019). *Zoo and wild mammal formulary*. John Wiley & Sons.
- Klimpel S, Kuhn T, Münster J, Dörge DD, Klapper R, Kochmann J (Eds.). 2019. *Parasites of marine fish and cephalopods*. Springer International Publishing.
- Kristiansen TS, Fernö A, Pavlidis MA, & Van de Vis H. (Eds.). (2020). *The welfare of fish* (Vol. 20). Cham, Switzerland: Springer International Publishing.
- Lewbart G A. (Ed.). 2010 & 2022. *Invertebrate medicine*. John Wiley & Sons.
- Lewbart GA (Ed.). 2016. *Ornamental Fishes and Aquatic Invertebrates: Self-assessment Color Review*. CRC Press.
- Manire, C. A., Norton, T. M., Stacy, B. A., Innis, C. J., & Harms, C. A. (Eds.). (2017). *Sea Turtle Health & Rehabilitation*. J. Ross Publishing, Incorporated.
- Miller ER., Lamberski N & Calle PP (Eds.). (2022). *Fowler's Zoo and Wild Animal Medicine Current Therapy, Volume 10*. Elsevier Health Sciences.
- Montiani-Ferreira, F., Moore, B. A., & Ben-Shlomo, G. (Eds.). (2022). *Wild and Exotic Animal Ophthalmology: Volume 2: Mammals*. Springer Nature.
- Montiani-Ferreira, F., Moore, B. A., & Ben-Shlomo, G. (Eds.). (2022). *Wild and Exotic Animal Ophthalmology: Volume 2: Mammals*. Springer Nature.
- Murphy D. 2003. Sirenia. Pages 476-482 in Fowler ME, Miller RE (eds) *Zoo and Wild Animal Medicine*. Elsevier Science.
- Urdes L, Walster C, Tepper (Eds.). 2022. Fundamentals of Aquatic Veterinary Medicine 1st Edition. Wiley-Blackwell. Covers the modules for both CertAqV and CertAqVNT. WAVMA receives all royalties.**
- Urdes L, Walster C, Tepper (Eds.). 2023. Pathology and Epidemiology of Aquatic Animal Diseases for Practitioners. Wiley-Blackwell. Complements and completes the pathology section in Fundamentals adding discussion on epidemiology and animal health economics.**
- Walsh MT, Bossart GD. 1999. Manatee medicine. Pages 507-516 in Fowler ME, Miller RE (eds) *Zoo and Wild Animal Medicine, Current Therapy*. Saunders.
- Walsh MT, de Wit M. 2015. Sirenia. Pages 450-457 in Miller RE, Fowler ME (eds) *Fowler's Zoo and Wild Animal Medicine*. Elsevier.
- Wong, A.W., R.K. Bonde, J. Siegal-Willott, M.A. Stamper, J. Colee, J.A. Powell, J.P. Reid, C. Deutsch, and K.E. Harr. 2012. Monitoring oral temperature, heart rate, and respiration rate of West Indian manatees during capture and handling in the field. *Aquatic Mammals*, 38(1):1-16.

Comments:

The above mention bibliography contains chapters or sections which will excellently serve as Journal/literature self-study.

Papers on marine mammals

<http://manatipr.org/aprendemas/articulos-de-investigacion-marina/>

Comments:

A long list of easily downloaded papers regarding marine mammals, particularly in relation to aquatic animal health, genetics, and strandings.

Caribbean marine mammal, sea turtle and marine bird Internship

<http://manatipr.org/voluntarios/internship/>

Comments:

The Caribbean Manatee Conservation Center (CMCC) and the Caribbean Stranding Network at the Inter American University of Puerto Rico offers 2-month (unpaid) internship, veterinary rotations or externships covering topics of (1) Rescue and Stranding Response, (2) Rehabilitation and Veterinary Care, (3) Population Research, and (4) Community Outreach. Total hours of the 2-month internship is about 320 hours.

AQUAVET summer courses

<https://www.vet.cornell.edu/education/other-educational-opportunities/aquavet/aquavet-general-information>.

Comments:

Cornell University and Roger Williams University offer a series of three courses for veterinarians or aquatic animal health biologists/researchers, including AQUAVET I (introduction to Aquatic Veterinary Medicine), AQUAVET II (comparative pathology for aquatic animals), and AQUAVET III (clinical aspects of captive aquatic animal medicine).

University of Florida Distance Learning courses

<https://aquatic.vetmed.ufl.edu/education/distance-learning-courses/>

Comments:

The University of Florida's School of Veterinary Medicine offers a number of distance-learning courses related to their program on Aquatic Animal Health. This includes for veterinarians an Aquatic Animal Medicine Certificate, a Care & Conservation of Aquatic Animals Certificate, SeaVet Clinical Training, and rotating veterinary internships. Additionally, their distance learning courses include Aquatic Animal Conservation Issues, Aquaculture I, Aquatic Wildlife Health Issues, Introduction to Fish and Aquatic Invertebrate Histology, Manatee Health and Conservation, Diseases of Warm Water Fish, and Marine Mammal Biology.

Conference with aspects or even workshops of aquatic animal health that you may attend:

- Biennial conference on the Biology of Marine Mammals, Society for Marine Mammalogy (<https://marinemammalscience.org/conference/2024-marine-mammal-science-conference/>)
- IAAAM Conference, International Association for Aquatic Animal Medicine (<https://www.iaaam.org>).
- SOLAMAC Conference, Latin American Society of Marine Mammal Specialists (<http://solamac.org/solamac/english/conferencias/mamiferos/especialistas/aquaticos/>)

Journals

- Journal of Aquatic Animal Health (<https://afspubs.onlinelibrary.wiley.com/journal/15488667>)

- Aquatic Mammals (<https://www.aquaticmammalsjournal.org>)
- Journal of Zoo and Wildlife Medicine (<https://bioone.org/journals/journal-of-zoo-and-wildlife-medicine>)
- Marine Mammal Science (<https://marinemammalscience.org>)
- Latin American Journal of Aquatic Mammals (<https://lajamjournal.org/index.php/lajam>)

Necropsy guides

- Manatee necropsies (<https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB83255273.xhtml>)
- Online sea turtle necropsy lecture series (<https://www.fisheries.noaa.gov/national/marine-life-distress/online-sea-turtle-necropsy-lecture-series>)
- Sea turtle necropsies (https://www.blue-world.org/bw/wp-content/uploads/2017/05/NETCET_Standard-protocols-for-post-mortem-examination-of-sea-turtles.pdf)
- Sea turtle necropsies (https://www.widecast.org/Resources/Docs/Work_2000_Sea_Turtle_Necropsy_Manual_ENG.pdf)
- Marine mammal strandings and necropsies (<https://core.ac.uk/download/pdf/4166343.pdf>)
- Cetacean necropsies (https://www.blue-world.org/bw/wp-content/uploads/2017/05/NETCET_Standard-protocols-for-post-mortem-examination-of-cetaceans.pdf)
- Dugong necropsies (https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjhg5axyPz8AhXeO0QIHcjVCCsQFnoECDwQAQ&url=https%3A%2F%2FelibRARY.gbrmpa.gov.au%2Fjspui%2Fretrieve%2F800acfc4-cdca-48d5-b2c4-149350001003%2FProcedures-for-the-salvage-and-necropsy-of-the-dugong-dugong-dugon.pdf&usg=AOvVaw1vC8CI8IP_hlcmhZTw3BWB).