

STANDARD OF CARE: PET FISH

Michigan Veterinary Conference

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Introduction

The keeping of fish as pets is a hobby with a long history. In recent years, particularly during the past decade, ornamental pond fish including koi and goldfish have become increasingly popular in various parts of the world. In fact, more pet fish are kept as pets in the United States than any other single group of animals including dogs, cats, small mammals, birds, and reptiles (AVMA, 1997; PIJAC, 1997). The hobby has also become more sophisticated in recent years and a growing number of veterinarians are gaining clinical experience with pet fish. Until the 1980's, except in rare instances, most of the medical care and husbandry practices were performed by the hobbyists themselves or with the help of the local pet store clerk or aquarium maintenance person. Many of these people are very knowledgeable and conscientious but there are no minimal training standards as there are in the veterinary profession. Additionally, we as veterinarians understand the principles of medicine, surgery, and animal husbandry. The same fundamental disciplines such as critical care, microbiology, parasitology, nutrition, pathology, and surgery that are applied to terrestrial animals can be applied to pet fish.

With regards to the Standard of Care (SOC) for this group of animals, koi, goldfish, and all commonly kept freshwater and marine bony fishes should be included. Sharks and other elasmobranchs, while occasionally kept in the home aquarium, are more frequently managed by aquarium and zoo veterinarians.

As our knowledge of fish diseases, therapeutics and water quality increase, more and more veterinarians will be qualified to responsibly work with these animals. Peer-reviewed articles on the clinical management of pet fish issues now appear in many veterinary journals. Nearly every major veterinary conference includes fish medicine in the program and several veterinary schools now offer continuing education courses on this subject. In addition, a growing number of textbooks and review articles contain valuable information on pet fish medicine. All veterinarians, even if they have never worked on a fish, have a broad understanding of disease processes, diagnostics, animal husbandry, and chemotherapeutics. The opportunity to apply this knowledge to a client's

pet fish problem can be a rewarding experience. Currently, some clinicians report that 10% or more of their income is generated by fish patients.

Minimal Standards

Continuing Education (CE)

Veterinarians treating pet fish should maintain their state licensure(s) and attend at least one CE session focused on fish medicine every other year. It is recommended that fish veterinarians be an active member of the International Association for Aquatic Animal Medicine (IAAAM), American Association of Zoo Veterinarians (AAZV (or both), and the American Veterinary Medical Association (AVMA). The American Fisheries Society (AFS) is an excellent organization and dedicates resources to fish medicine and pathology.

Pet fish veterinarians are also encouraged to join local organizations, such as aquarium and garden pond clubs, and to attend or make presentations when possible.

A number of annual courses and programs (listed below) are available to the interested veterinarian and veterinary student, and while not mandatory, would be a good way to round out one's education.

-Regularly offered Continuing Education Programs:

Advanced Fish Medicine (University of Florida); every other year

*Aquavet I&II (University of Pennsylvania/Cornell University)

*Aquamed (Louisiana State University); every other year (even years; next in 2006)

Diseases of Warmwater Fishes (University of Florida); every other year

Fish Health Management Course (North Carolina State University)

-Annual Meetings of Note:

*AAZV

*Eastern Fish Health Workshop

*IAAAM

*NAVC

*WVC

-Internship Programs:

*New England Aquarium

*Mystic Marinelife Aquarium

*National Aquarium in Baltimore

*Florida Aquarium/UFL Tropical Aquaculture Laboratory

*Shedd Aquarium

Michigan State University

Mississippi State University (catfish medicine)

-Residency Programs:

North Carolina State University

University of Florida

*Not exclusively fish medicine

Staff training- Many veterinary meetings (NAVC, WVC, AVMA, etc.) regularly offer CE for veterinary technicians. In house training is recommended and can be used to supplement knowledge gained at CE meetings.

Recommended Library (Note: Information is constantly changing and it is imperative to update your library with the current literature)

Textbooks

- Brown L: Aquaculture for Veterinarians. Pergamon Press, Oxford, England, 1993, 447 pp.
- Carpenter, J et. al. Exotic Animal Formulary, Third Ed. Elsevier, Philadelphia, 2005.
- Ferguson HW. Systemic Pathology of Fish. Iowa State University Press, Ames, Iowa, 1989.
- Fowler ME, Miller RE (eds). *Zoo & Wild Animal Medicine: Current Therapy 4*. WB Saunders Co, Philadelphia, 1999.
- Gratzek, JB: Aquariology: The Science of Fish Health Management. Morris Plains, NJ: Tetra Press, 1992, 330 pp.
- Johnson, EJ: Koi Health and Disease. Johnson Veterinary Services, 3805 Robinson Rd., Marietta, GA 30068, 1997, 141 pp.
- Lewbart, GA: Self-Assessment Color Review of Ornamental Fish. Iowa State University Press, 1998, 192 pp.
- Noga, EJ: Fish Disease: Diagnosis and Treatment. Iowa State University Press, 2000, 340 pp.
- Roberts RJ. Fish Pathology. WB Saunders, Philadelphia, 1989.
- Saint-Erne, N. Advanced Koi Care, Erne Enterprises, Glendale, AZ, 2003, 194 pp.
- Spotte S: Captive Seawater Fishes. New York, Lea and Febiger, 1992, 942 pp.
- Stoskopf, MK: Fish Medicine. Philadelphia: W.B. Saunders Company, 1993, 882 pp.
- The Merck Veterinary Manual, Eighth Edition, Merck & Co., Inc., National Publishing Co., Philadelphia, PA, 1998.
- Treves-Brown KM. *Applied Fish Pharmacology*. Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000.
- Wildgoose WH (ed): BSAVA Manual of Ornamental Fish, 2nd ed., Gloucester, England, 2001.

Journals

- Diseases of Aquatic Organisms
- ExoticDVM Magazine
- Journal of Aquatic Animal Health
- Journal of Fish Diseases
- Journal of the AVMA
- Journal of Zoo and Wildlife Medicine
- Seminars in Avian and Exotic Pet Medicine. Fudge, A., ed. Elsevier.
- Veterinary Clinics of North America: Exotic Animal Practice. Elsevier
- Veterinary Record

Hospital Physical Plant

Hospitalizing fish patients can be a challenge but will be necessary on occasion. A variety of aquarium support equipment and supplies including tanks, pumps, filters, nets, siphons, heaters, and water conditioners are required. In many situations the owner of the fish can provide some or all of the necessary materials, including conditioned biological filter substrate, for the hospitalized patient. A room or portion of a room dedicated to fish life support is ideal. The majority of equipment and supplies listed below can be used in the hospital and in the field.

Equipment and Supplies (not including most drugs and standard clinic supplies--a more detailed list appears in the Pet Fish Clinic Supplies section of this notebook)

Husbandry

Air pumps
Air tubing
Assorted plastic totes/sweater boxes
Assorted glass aquaria
Assorted sizes of plastic fish bags
Assorted nets
Commercial dechlorinator
Rubberbands
Sea Salt
Sponge filters
Water test kit
Water sample bottles (plastic, 250 ml)
5-gallon bucket(s)

Medical

Centrifuge
Complete dissecting kit
Compound microscope
Eugenol (clove oil) 1:9 with 95% ethanol (stock approx. 100 mg/ml)
Fish anesthesia machine
Gram scale (to 1 kg)
KG scale (to 10 kg)
MS-222 (10 mg/ml buffered stock solution)
Oxygen tank with regulator
Plastic surgical drapes
Refractometer
Sterile surgical pack(s)

Clinical Assessment

-A complete history should be taken on each patient or each population of patients.
-Fish should be first given a gross "in tank" or "in pond" inspection if appropriate followed by a thorough physical examination.
-In the majority of cases the aquarium or pond water should be tested. An accurate and properly functioning test kit is probably the fish clinician's most valuable diagnostic tool. The basic pet fish diagnostic laboratory must be equipped to test for temperature,

ammonia, nitrite, nitrate, pH, dissolved oxygen and total alkalinity. Test kits that measure copper and chlorine are also desirable. Most state diagnostic labs can perform heavy metal and miscellaneous toxin testing. Several companies manufacture test kits that accurately and inexpensively test the appropriate water quality parameters.

Procedures

-The following list of procedures, while not applicable in every case, should be available and the practitioner should be comfortable with utilizing them or alternatively know where/when to refer.

Anesthesia/sedation

Cloacal lavage Celiotomy

Coelomic lavage

Enucleation

Eye aspiration

Fin biopsy

Gas bladder lavage

Gastric lavage

Gill biopsy

Intracoelomic (ICe/IP) and intramuscular (IM) injection sites

Microbiological sample collection (frequently kidney, spleen, liver)

Necropsy

Skin biopsy

Surgical wound repair

Tube-feeding

Venipuncture

Drugs (Refer to the Formulary section of this notebook for more details)

There are currently no drugs approved by the FDA for use in pet fish (although a small number are approved for use in fish intended for human consumption) in the United States. Many commonly employed veterinary compounds, including antibiotics, parasiticides, and disinfectants, should be on hand and available for use with pet fish patients. The fish practitioner should also be aware of the wide use of over-the-counter (OTC) drugs by pet fish hobbyists. An effort should be made to learn about these OTC compounds and have a basic understanding of their ingredients and impact on the patient and its environment.

Laboratory support

Fish clinicians should identify a laboratory that is familiar and comfortable handling fish samples, especially those related to clinical pathology and microbiology. In some cases this may require more than one laboratory.

Miscellaneous

With literally hundreds of species kept in captivity from a variety of (sometimes) unrelated families, it is understood that the clinician will not be familiar with every species of fish with which they are presented.

Fish clinicians should:

- Be familiar with zoonoses and be able to speak intelligently to their clients on this topic
- Cultivate a list of colleagues to share information and seek consultation
- Have a thorough understanding of the natural history, anatomy, and physiology of the major groups of pet fishes (eg. goldfish, koi, cichlids, livebearers, anabantoids).

Summary

Fish medicine is a growing and rewarding area of our profession. Many fish owners have strong emotional bonds to their fish and they seek state-of-the science care and support for their sick or injured pets. The fish medicine knowledge base is small compared to that of small animals or even some of the other exotic taxa. All fish practitioners are encouraged to contribute to this base of knowledge, either by publishing their findings or sharing information and discoveries with colleagues. The Fish Practice SOC document is not comprehensive or permanent and will continue to change, grow, and develop over time.