Veterinary care of seahorses

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Seahorses are incredible fish. Their family (Syngnathidae) are unique among vertebrates in that the males bear the young. They move their eyes independently like chameleons, have prehensile tails, dermal armour plating and often have considerable colour changing abilities.

However, they can also be somewhat awkward veterinary patients. They are generally quite small, delicate and their bony dermal plates complicate injections.

Biology

The biology of seahorses is fascinating in itself. Their shape and structure marks them out from most fish, with the long, largely fused snout; independently mobile eyes; reasonably long, flexible neck; upright stance; bony rings; and long, muscular, prehensile tail. They also lack any significant stomach and have a very short gut (**Figures 1 and 2**).

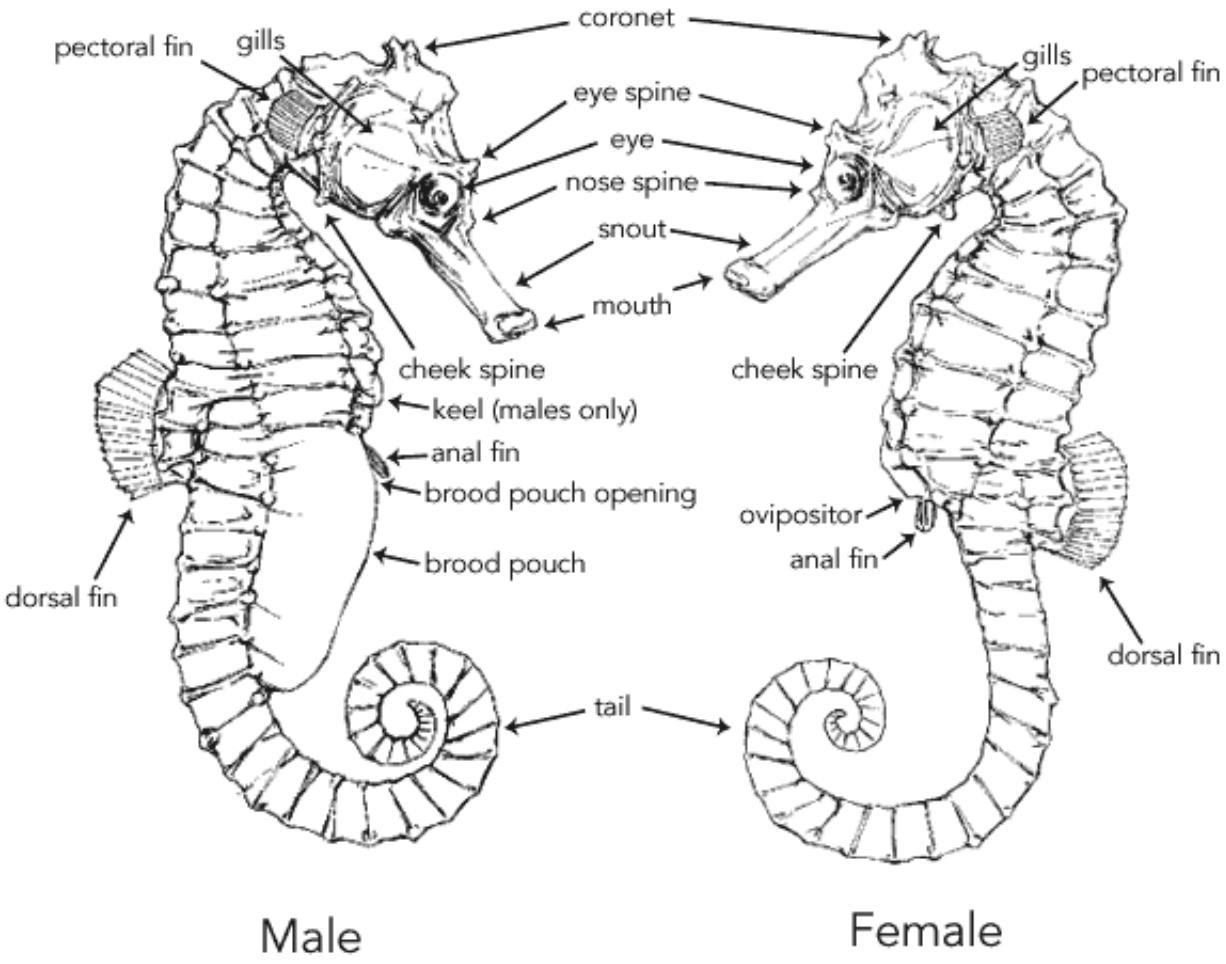

Figure 1. Seahorse anatomy external (reproduced with permission from fusedjaw.com).

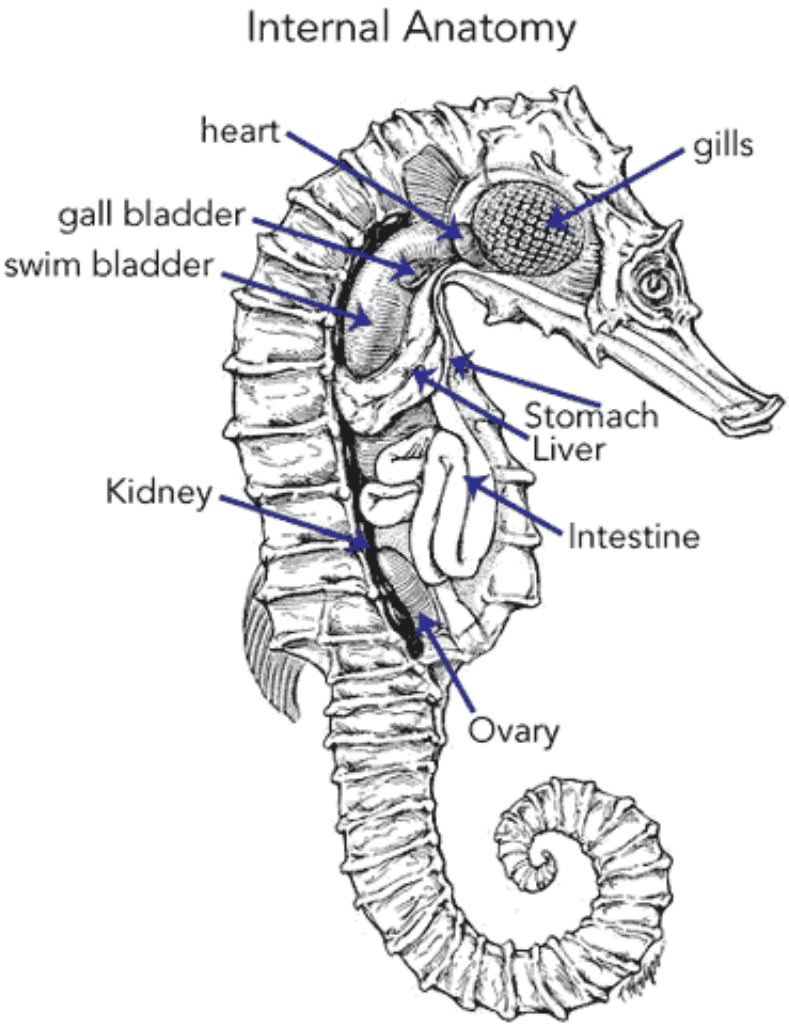

Figure 2. Seahorse anatomy internal (reproduced with permission from fusedjaw.com).

They are generally fairly sedentary fish, found in seagrass beds at depths of around two metres to 10 metres (can be up to 50m), clinging on to plants or rocks with their tails and eating small crustaceans. The ingestion mode is generally called “snicking” and involves a fairly explosive opening/suction creation in the snout, sucking the prey in with a visible “trigger” under the base of the jaw (which can occasionally become stuck).

In syngnathids, the male truly bears the young – the female seahorse deposits ova into the male’s brood pouch, on the ventral abdomen, where the young develop. They are nourished from the male

(the lining of the brood pouch develops a good supply of capillaries) and released as more or less fully formed miniature adults.

Broods may number in the hundreds of young and mortality is generally quite high – even in captivity some level of mortality is probably inevitable.

Adult size varies with species, from a centimetre or so to 25cm-plus in total length. Weight can be up to approximately 50g for a large individual of the larger species.

Keeping seahorses

Traditionally considered delicate and difficult to keep, seahorses are not for the beginner to marine fish keeping. However, they may be successfully kept and bred. Rearing the small fry successfully is, however, very difficult in most cases.

Figure 3. Basic seahorse tank.

Availability is mostly through specialist suppliers, although a few make their way into more “regular” marine fish shops. All species are on the Convention on International Trade in Endangered Species of Wild Fauna and Flora list (endangered due mainly to habitat loss and/or collection due to Chinese medicine beliefs).

Various species may be presented, with multiple common names – some are known simply by their scientific names. Examples include *Hippocampus reidi* (Brazilian reidi/giant Brazilian/longsnout seahorse; **Figure 3**), *H abdominalis* (pot-bellied seahorse), *H kuda*, *H zosterae* (dwarf seahorse),

and *H barbouri* (Barbour's seahorse).

Of the common species, *H abdominalis* is notable for being a relatively coldwater species, preferring temperatures in the 16°C to 18°C range (which will require active cooling in most cases in the UK). The other common species are generally tropical, doing best at 22°C to 25°C.

Like all fish, they require good water quality, but seahorses are prone to leaving lots of uneaten food, so good hygiene is important. Some areas of reasonable water movement in the tank (**Figure 4**) are probably beneficial. Food consists of small crustaceans, preferentially live, but many captives can be persuaded to take frozen.

One of the most notable requirements for syngnathids in captivity is a lack of competitive species – they do not compete well with other fish.

Veterinary care

Please note while some wider points are made, general approach to the fish veterinary case will not be covered here due to space constraints.

As with all fish patients, problems of transport, examination, treatment and hospitalisation must be considered.

Consultation

The husbandry must be fully evaluated – ideally this is done by visual inspection, but where a home visit is not practical, a checklist approach to questioning the owner about the fish's husbandry is strongly recommended.

Observation

Observation of the animal in water is a vital step in examination, and will generally be more rewarding in the home set-up than transporting the seahorse to the surgery.

Figure 4. Male (R) and female (L) *H reidi* being hand fed river shrimp.

Seahorses should normally be hitched most of the time, although long-term captives may show excitement due to assumed feeding when disturbed.

Respiration can be observed by watching gill plate movement – the rate is almost certain to be raised if the animal is transported to the surgery. The tail should curl inwards towards the body in most cases, although it may be extended when swimming.

Seahorses are not strong swimmers, but movement should be coordinated. Some captive animals show poorly coordinated or flailing movements.

It is worth noting body symmetry – often a good thing to check for in an unfamiliar species – does not always apply to seahorses. In dorsoventral view, many individuals will be asymmetrical.

Observation when eating is useful to assess snick strength, coordination and vision.

Physical examination should be gentle, done with gloves and kept as brief as practical. It is very easy to damage the scaleless skin of these fishes. They can be gently restrained loosely in the hand – they will generally curl the tail to grip on. Tail gripping propensity varies with species and individual, but, generally, the tail should automatically try to grip the holding/hand finger.

The bony plates and size unfortunately mean physical examination may be limited, although as thorough as possible an exam should be carried out.

Transillumination may be helpful in some species/individuals, but care must be taken to avoid overheating.

Diagnostics

Water testing is required, but space precludes a comprehensive treatment here. The usual parameters should be assessed: ammonia, nitrite, nitrate and pH for a basic screen. Oxygen, minerals and metals (especially copper, which may have been used as a treatment by the owner) may also be investigated.

Skin/mucus scrapes are useful for parasite load evaluation, but, unfortunately, the anatomy of seahorses precludes gill snips or scrapes in live fish.

Microscopy and microbiology of pus/lesions is always advisable, and should be carried out by laboratories or personnel familiar with samples from fish.

Acid-fast staining for mycobacterial organisms should also be done.

Blood sampling is possible in larger species, from the ventral tail vein (ventral midline of tail). The volume that can be obtained is obviously limited and lack of normal values hinders interpretation. The author recommends no more than 0.5% of bodyweight – for example, 0.25ml in a 50g seahorse.

The animal's size is the main constraint on useful imaging, but all normal imaging modalities may be used.

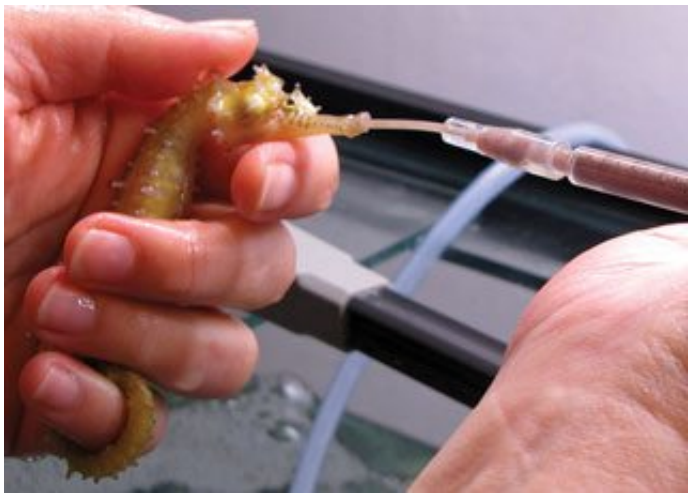

Figure 5. Gavage tubing seahorse.

Treatments

Injections, which will generally be intramuscular (epaxial is recommended), are complicated by the bony plates. Some gentle probing to find a suitable point of insertion for the needle is often

necessary. Intracoelomic injections may be used with very fine needles and non-irritant drugs.

Dosing by gavage and water treatments (baths/dips) are an alternative. Soaking (live) food in medication has been described, but dosage is unreliable (**Figure 5**).

Anaesthesia

Anaesthesia is essentially as with other fish (tricaine methanesulfonate; MS 222, which should be buffered) or 2-phenoxyethanol. Dosing should be to effect, but doses are generally relatively high for fish – typically 125mg/L of MS-222 or 1ml/L 2-phenoxyethanol.

Diseases

Figure 6. Radiography of male seahorse showing gas in brood pouch.

Several diseases seem particularly associated with seahorses in captivity. They are also susceptible to most other marine fish parasites and pathologies, which will not be dealt with here.

Gas bubble disease can be divided into three categories.

Pouch emphysema – males quite frequently get gas trapped in the brood pouch (**Figure 6**), although it is important to be aware a swollen pouch may be entirely normal, with pregnancy or male display. Pouch emphysema generally has a reasonable prognosis – the animal may be able

to release the gas itself, or gentle physical manipulation (aided by gentle expansion of the pouch opening with a blunt-ended soft tube) has a good success rate in most cases. It may, however, be associated with secondary complications.

Internal gas bubble disease tends to be more common in juveniles and can be a major cause of mortality. Tanks with continual flow such as pseudo-kriesels may help in prevention, and diet may also be a factor.

Subcutaneous gas bubbles usually occur in the tail, often near the tip. This form is usually associated with local infection and often carries a guarded prognosis.

Mycobacteriosis

Syngnathids seem relatively prone to mycobacteriosis. Generally vague signs are seen, although occasionally visible external abscesses (typically very white pus when expressed/burst) or granulomata will be apparent – the chronic wasting seen in many other fish seems rare in seahorses. Often, it is only diagnosed on postmortem examination.

Treatment of mycobacteriosis is controversial. The zoonotic potential and generally poor treatment response lead many authors to recommend euthanasia, and even possible depopulation and complete tank disinfection. It is certainly a rare owner who will be willing and able to keep up treatment (the author suggests rifampicin plus a fluoroquinolone or aminoglycoside) for weeks to months. Depopulation is arguable – there may be a background sporadic level of morbidity/mortality from this disease over time, but good tank hygiene and maintaining optimum tank and fish condition will minimise this, and the myriad possible sources of mycobacteria mean preventing it entering a new tank is probably impractical.

Scuticociliatosis

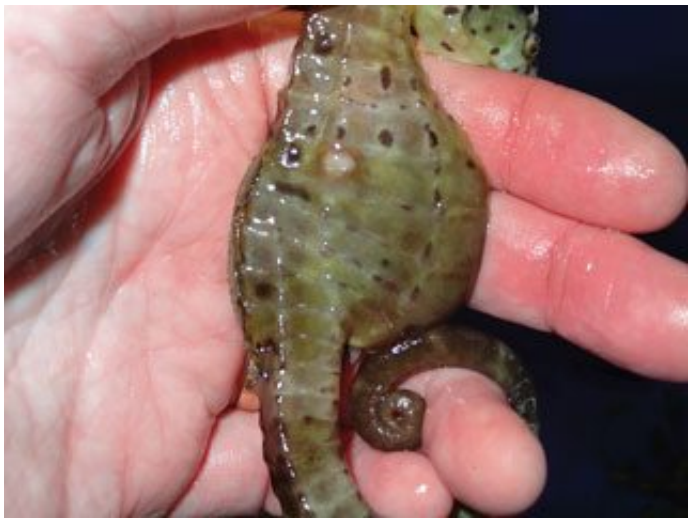

Figure 7. Ulcer on flank of pot-bellied seahorse.

Scuticociliatosis can be caused by various scuticociliates – notably *Uronema*, which you may often see referred to in hobbyist literature. They tend to be of variable pathogenicity depending on conditions, but certainly can cause high morbidity and mortality.

Signs will generally include skin ulcers (**Figure 7**), although they may be non-specific.

External treatments (freshwater dip, formalin dip or bath) may be effective in early mild cases, and a formalin bath will help reduce the system load, but systemic scuticociliatosis can be difficult to treat successfully.

Metronidazole may be tried.

Tail rot

Figure 8. Tail rot in seahorse – cream applied.

Tail rot (**Figure 8**) is associated with various possible causes including bacteria, scuticociliatosis and mycobacteria. Prognosis is often guarded and systemic antibiotics are always indicated.

Bacterial infection

Commonly attributed to *Vibrio* species, presentations are variable from acute death to ulcers, plus

tail or snout rot. Caught early, antibiotics are usually effective, but advanced cases carry a guarded prognosis.

Other conditions

Urolithiasis has been described in various species of seahorse, but the cause is unknown.

Systemic fungal disease is reported as a significant problem in seadragons in aquaria, but has rarely been described in seahorses. No successful treatment has been described.

Bronchitis may be associated with various organisms (flavobacteria, epitheliocystis, other bacteria, uronema and other parasites). As noted, premortem specific diagnostic options are limited, but in cases of heavy respiration, ruling out water quality issues and skin scrapes for general parasites, followed by trial shotgun therapy, is a realistic approach.

Bilateral myopathy, of suspected nutritional origin, is described as a common cause of “weak snick” – a common complaint, but diagnosis antemortem is problematic.

Syngnathid formulary

There is no pharmacokinetic data on drugs in syngnathids to the author’s knowledge. Doses are generally extrapolated from other fish (which doses might be extrapolated from other taxonomic groups).

General aquarium treatments seem usually safe with seahorses (ensure suitability and dose for marine systems), but it is worth checking specific products in literature and on online forums for any observed adverse effects.

As with all fish medications:

- water quality should be optimised
- water treatments in the main tank should be avoided if possible (short-term baths/dips in temporary containers are generally preferable). If the main tank is treated, water quality must be monitored closely, and accessories that might affect drug concentrations (such as UV filters or activated charcoal) switched off or removed
- baths/dips should be carried out in water similar to that in the main tank (salinity, pH, temperature)
- hitching posts should be provided in treatment enclosures
- seahorses should be closely monitored for distress during any bath/dip treatments

Syngnathid formulary

Gavage – stomach tube (although sea-horses lack a significant stomach)
ICOE – intracoelomic injection
Note 1ppm = 1mg/L
Asterisked drugs have been used by the author with no apparent problems. Note all these drugs are unlicensed.

Table 1. Syngnathid formulary – antimicrobials (not licensed)

Drug	Dose/route	Notes
Marbofloxacin*	10mg/kg IM every 48h	
Enrofloxacin*	5mg/kg IM, by gavage SID 5mg/L bath 5h SID	Use injectable or tablet, not oral form for bath
Enrofloxacin and metronidazole	Enrofloxacin 10mg/L, metronidazole 10mg/L together in bath. Bathe 24hr every second day	Shotgun therapy covering common bacterial/protozoal diseases
Rifampicin*	10mg/kg by gavage SID	
Ceftazidime*	20mg/kg IM, ICOE every 72h	
Amikacin*	5mg/kg IM every 48h	
Silver sulphadiazine*	Apply topically BID	Ulcer/exposed tail rot

Table 2. Syngnathid formulary – antiparasitics (not licensed)

Drug	Dose/route	Notes
Formalin	General: 20mg/L in main tank Dip 200mg/L to 250mg/L for up to 30 mins Bath 100mg/L for 1h	Observe closely for signs of distress Oxygenate water
Chloroquine	10mg/L in main tank	
Metronidazole*	50mg/kg by gavage SID Bath 10mg/L to 25mg/L for 24h daily	
Proprietary preparations of formaldehyde/ malachite green	Follow manufacturer's instructions	
Freshwater dip	10 mins	Water must be dechlorinated and matched for temperature, pH to tank water Observe for distress

Table 3. Syngnathid formulary – other drugs (not licensed)

Drug	Dose/route	Notes
Meloxicam*	0.2mg/kg IM, orally every 24h	
Acetazolamide*	5mg/L continuous bath	Change daily

Tables 1-3. Syngnathid formulary (antimicrobials, antiparasitics and other drugs).

Internet resources

- The World Association of Aquatic Animal Medicine produces webinars including a recent one on disease of syngnathids www.wavma.org/webcepd
- There are several good websites worth looking at, often with forums and/or mailing lists. Bear in mind these are largely hobbyist-run rather than veterinary, and information can be given without adequate backup:
    - www.fishbase.org is useful for background data on unfamiliar species
    - www.fusedjaw.com
    - www.seahorse.org
    - www.seahorse.com

Further Reading

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