**Hadfield, Clinical Guide to Fish Medicine, Chapter A13: Environmental Considerations of Immersion Medications** - reviewed by HSS

What water conditions increase the risk of toxicity during copper immersion treatments?

1. Low temperature, high alkalinity, high pH
2. Low temperature, high alkalinity, low pH
3. High temperature, low alkalinity, low pH
4. High temperature, low alkalinity, high pH
5. High temperature, high alkalinity, high pH

Answer: C

**Chapter 12: Elasmobranch Quarantine.** Elasmobranch Husbandry Manual II. 2017: 113-133.

Laura Martinelli

**Question:** What particular parasite should you be concerned about when bringing a Cownose Ray (*Rhinoptera bonasus*) from the wild into managed care? What diagnostic test/procedure would you do to assess the level of this parasite in this individual?

**Answer:** *Eimeria southwelli*, coelomic aspirate or flush and cytology

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**Chapter 29: Pharmacology of Elasmobranchs: updates and techniques.** Elasmobranch Husbandry Manual II. 2017: 289-300.

Laura Martinelli

**Question:** What group of drugs has caused ulcerative necrosis and death in elasmobranchs and should be used with caution?

1. Cephalosporins
2. Sulfonamides
3. Macrolides
4. Chitin inhibitors
5. Organophosphates

**Answer:** B

**Fowler 10 Ch 59 - Antibiotic Resistance in Public Aquariums**

**Question:** Which medication falls under category A (should be avoided in veterinary medicine) based on antimicrobial stewardship advice in aquatic animals?

1. Rifampin
2. Ceftazidime
3. Enrofloxacin
4. Amikacin
5. Doxycycline

Answer: A

Ceftaz and enro = category B (restricted and high priority by WHO)

Amikacin = category C (use with caution and only if no category D are effective)

Tetracyclines = category D (low risk but use with prudence)

**Fowler 9 Ch 17 - Disease Risks to Native Wildlife from Zoos and Aquariums**

**Question:** Which characteristic makes a pathogen best equipped to spillover to wildlife from a zoo or aquarium?

1. Requirement for a specific host species
2. Short incubation and infectious periods
3. Needs native ecosystem to establish reservoirs
4. Reliance on host density for transmission
5. Ability to rapidly evolve and adapt

Answer: E

Hadfield CA. Fish Quarantine. In: Hadfield CA, Clayton LA (eds.). Clinical Guide to Fish Medicine, 1st ed. Hoboken (NJ): John Wiley & Sons, Inc; 2021. p. 298-311.

Chapter A15. Fish Quarantine

According to Hadfield's "Clinical Guide to Fish Medicine," which of the following steps is crucial before releasing fish from quarantine to minimize the risk of disease outbreak?

A) Administering a prophylactic treatment right before release to ensure pathogens are eradicated
B) Maintaining the fish on a specific medication regimen until the day of release
C) Verifying that a set period has passed without any morbidity or mortality, combined with a set period free from medications
D) Ensuring that all diagnostic tests for possible medical issues have been submitted
E) Performing a comprehensive feeding trial to ensure acceptance of the new diet before release.

Correct answer: C) Visual exam, review of quarantine records**, a set period without M&M, and without medications,** as well as diagnostic test results are important to clear quarantine. This rules out options B & D. While water quality and diet acclimations will be performed, the outline does not discuss 100% transition prior to quarantine clearance, although that would be most ideal. A prophylactic dip treatment is acceptable upon entry to quarantine to prevent perpetuating infectious disease in the quarantine system but should be eradicated prior to quarantine release.