Rounds Animal Health Department Medical Rounds "medicine for all"

NATIONAL MARINE LIFE CENTER Caring for Stranded Marine Animals

Notes Veterinary Research Department Under the microscope

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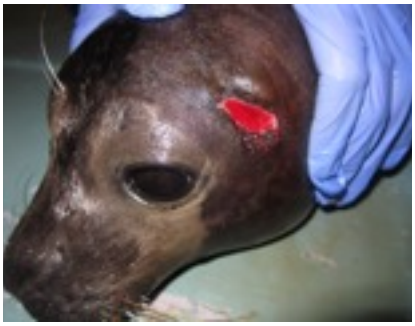
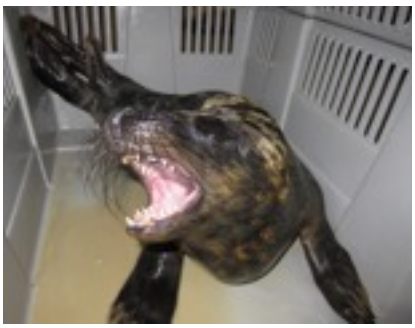
HeadHeadlines News: Towsend

p o s t - o p

wt = 35.5 kg; TPR = 98.9, 120, 40-60

Towsend did well with anesthesia and the surgery was preformed flawlessly by Dr. Kochin. Fragments of sequestra were removed, the external ear canal removed and the lateral wall of the tympanic bulla opened for drainage. The wound had swelling and dehisced shortly after the procedure, Towsend may have been scratching at it, but I did not know how to put an E-collar on a seal. It is healing in now. d/c all meds, a healthy granulation bed is resistant to infection.





Clinical Update:Howland

f a i l u r e t o t h r i v e

wt= 12.5, TPR= 99.4, 140, 60 B/S 1/5

last blood: last rads: ABD 5/7/13

eating and gaining weight, mild bilateral nasal foam with restraint, cytology taken. Phocine herpes virus PCR negative.

UNDER the Microscope:

W a l r u s n a s a l m i t e s

This is an example of O*rthohalarahne attenuata*, from the nasal cavity of a stranded Walrus from Alaska that found its way into captivity. Originally described as *Halarachne rosmari*, no wild cases have been found but this is at least the second case in a captive walrus. The same species is also found in sea lions and other pinnipeds and is an established pathogen, nasal mites have also caused severe disease in the grey seals, and even humans have been infected with marine mammal nasal mites, so infection is nothing to sneeze at.

Sea Turtles:Topsy 20

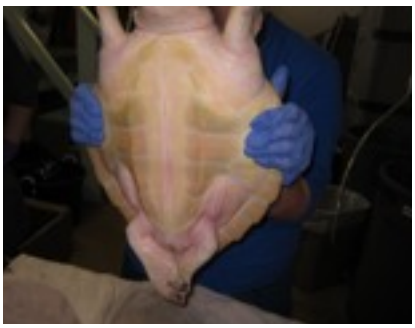
resolving cold-stun

CC: plaston abrasion Meds: Ceftaz 20 mg/kg IM q3d 14 days
Last Blood: 3-26-13; LDH, resolving
Last Rads: 3-26-13
wt=3.5 kg, SCL=27.0, SCW=25.2, HR=48, BAR, B/S=3/5
CAUTION I TRY TO BITE. Wounds have healed up, gaining weight and looking good, minor pin point areas in back of oral cavity and mild abrasion on caudal plastron.

Sea Turtles:Gerald 21

resolving cold-stun

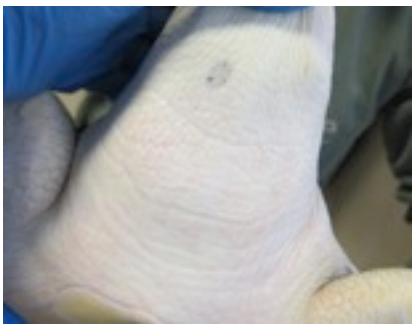
CC: flipper tip lesions, resolved
Last Blood:3-26-13, glu and UA resolved, increase CK, LDH and PCV
Last Rads: 1-16-13 repeat flipper tips, 3/26/13
wt= 6.2 kg, SCL=33.4, SCW=30.0, HR=44, BAR, BS= 3/5
Wounds resolved, PE WNL



Sea Turtles:Betsy 22

resolving cold-stun

CC:resolving rash and circular neck mark, flipper tip lesions
MEDS:d/c
Last Blood:4-2-13; spike in AKLP,ALT,AST,CK, and LDH (>11K)
Last Rads:1-23-13, repeat flipper tips,
wt= 5.6, SCL=31.1, SCW=28.5, HR=48, BAR, BS= 3/5
circular neck mark unchanged, rash is resolved other PE WNL. Recommend continued rehab.



Sea Turtles: 'wild' Walter 23

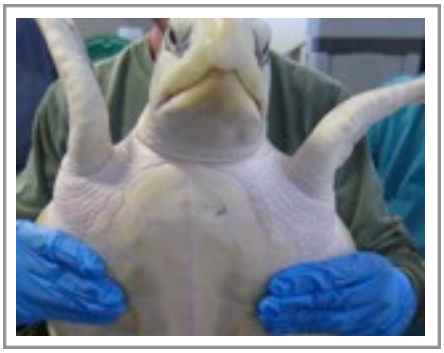
post cold stun

RELEASED !

Sea Turtles: Carolyn 24

flipper tip lesions

RELEASED !



Sea Turtles: Phoenix 25

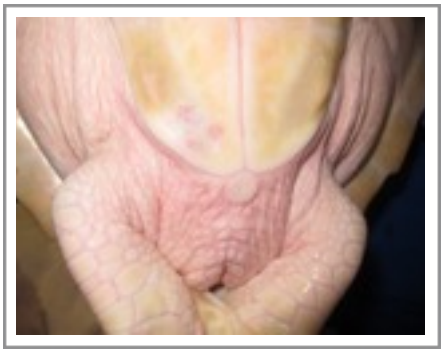
resolving cold-stun

RELEASED !

Sea Turtles: Ernest 26

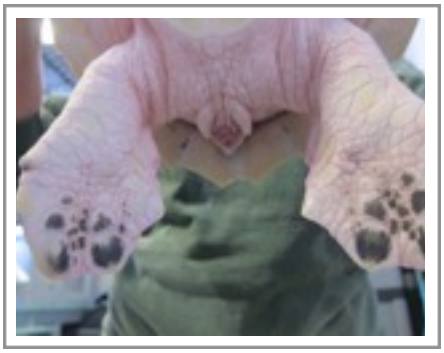
rash resolving, minor flipper tips

CC: resolving flipper tip lesions
Last Blood:3-26-12; spike in LDH UA resolved, eosinophilia
Last Rads: 1-9-13, phlange autolysis 2-5-13
wt=3.5 kg, SCL=27.1, SCW=25.4, HR=60, BAR, BS = 3/5
Resolved flipper tip lesions, mild plastron abrasions, right caudal, right marginal scutes.



Sea Turtles: Papi 27

RELEASED !



Infectious disease testine: PCR vs titers vs cultures

In the modern era, we test for infectious diseases by many modalities, each has it's strengths and weakness, but the general rule of medicine still applies, a negative test is not proof of the absence of the organism. Or, a positive means something, a negative . . .well . . .

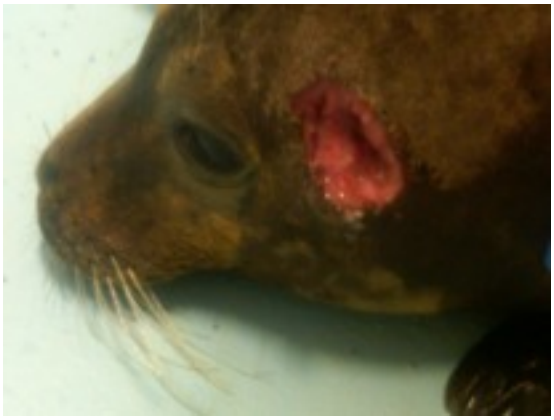
The classical approach to diagnosing an infectious disease centered around the ability to culture the organism in the laboratory, and this approach is still widely used and very practical for most mammal bacterial and fungal diseases. Improvements in diagnostic laboratory capacity have even made the culture of some viral pathogens possible at the clinical level. However, many infectious organisms do not travel well, nor do they always grown in artificial media, and multiple plates of different growth media are often necessary and still inadequate. Of great clinical significance, is the fact that once the organism is isolated in pure culture, antimicrobials can be tested for effectiveness. This is how we discovered the bacteria *Proteus mirabilis* and *E. coli* from the middle ear polyp and discharge respectively. It also allow us to evaluate a number of antibacterial drugs. The *P. mirabilis* was sensitive to amoxicillin, along with a variety of other antibiotics. The sensitivity of *Enterococcus* species, also recovered from the polyp, was sensitive to amoxicillin. The external discharge from the opened surgical wound had *Proteus* along with *E. coli*, both of which were resistant to amoxicillin and most antibiotics tested, however, this external contaminated wound was not as good an indices to the deep infection as the surgical samples, so amoxicillin was used with good success.

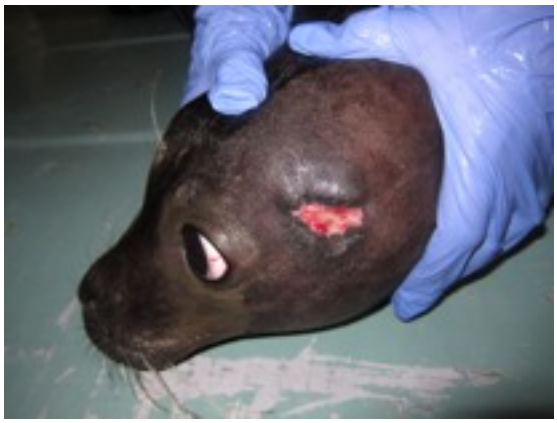
Next came serology. If the body is infected, it is hoped the immune system will mount a specific host response in time. First, by the development of IgM antibodies followed by IgG antibodies. Both take time to be assembled by the body, so during the acute illness the immunoglobulins may be negative, followed by an IgM response which lasts weeks, and then by the very efficient long term antibody, IgG, which can persist for years. Once a host has been exposed, a second exposure of the same organism should result in a very rapid and very strong development of IgG which can even protect from future infection, which is why you can't get the same strain of the Flu twice, however, many infections do not confer life long immunity, such as Lyme disease. As with all cases, lots of specifics abound. Serology measures exposure not active infection, it is a measure of the host response.

PCR is the new kid on the block, but is an established non-culture method for detecting the presence of specific pathogens. PCR stands for polymerase chain reaction, in which minute amounts of DNA from an organism are amplified so it can be sequenced into the DNA base pairs that make up the genetic material of all life on earth. The sensitivity of specific DNA probes can then be set to identify a specific species, a genus, or say all fungi with a universal fungi primer. PCR tests for the organism it's self, but just because the test is negative does not mean the host is free of the pathogen being sought, just that no DNA from that pathogen could be amplified from the specimen sent to the laboratory.

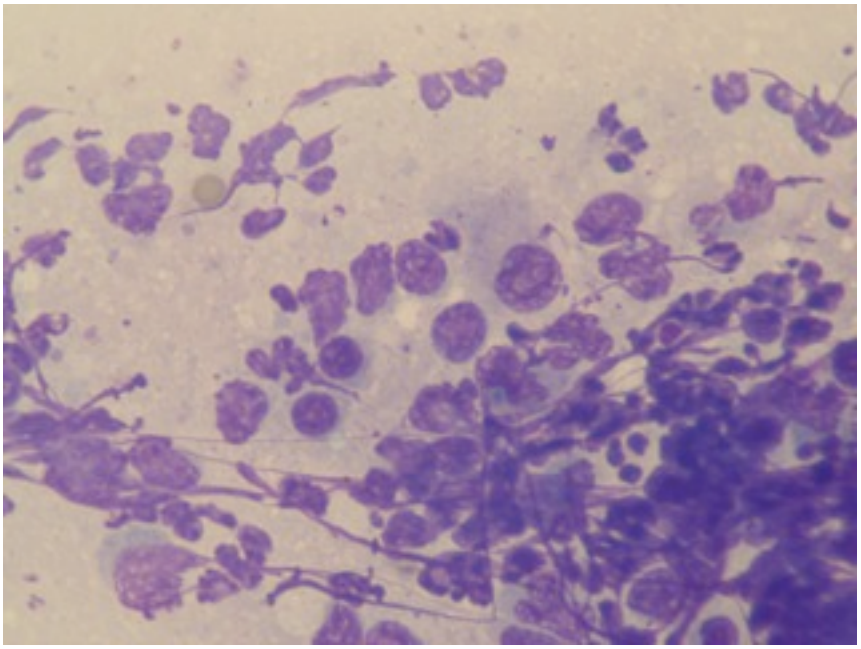
Nothing in this world is perfect, but a good rule of thumb we will use involves culture of bacteria and fungi to guide therapy, serology to detect exposure, and monitor changes in the body's response to infection, and batteries of PCR arrays to look for novel pathogens and establish if an animal is actively shedding the pathogen and thought to be contagious.

Healing by secondary intension: How to go from this to that.





Once an open wound is exposed to the environment, primary healing is not possible. Further closure of this type of wound would only trap more bacteria under the skin leading to an abscess or cellulitis. It is better to allow healing by secondary intension. In controlled hospital setting for domestic species a series of wet-to-dry bandages are applied under sterile technique and the bandage changed daily. In aquatic animals this nifty trick is not practical, so we relied on the good ozone disinfection of the tank water and our filtration system, and allowed this surgical dehiscence to heal in by contraction, granulation and finally re-epithealizaiton. This process can take 3-6 week, but as you can see we are making good progress. Without a fistula formation I am expecting the wound to heal in about a week. Meanwhile Towsend is eating fish and putting on weight. We are considering a final CT and hearing test at WHOI, but we want the skin to heal first before we start planning on release.



This digital micrograph shows that the nature of the exudate has turned from suppurative to chronic active. I discontinued antibiotic therapy today, as a healthy granulation bed is resistant to infection. With any luck we can have Towsend back to the wild by summer.

C Roger Williams VMD

Sea Rogers Williams VMD
attending veterinarian and director of science