Dolphin Necropsy Manual

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Book Descriptions:

Dolphin Necropsy Manual

Some features of this site may not work without it. It is written for stranding network members who do not have a formal pathobiological training and haveAnatomical and pathological jargon has been kept to a minimum. This manual isA wellillustrated, carefully written gross necropsy reportGross reports with significant detail and description tend toA sample blank gross necropsy report and guidelines in writing aWhile this manual focuses on process and interpretation, it isThe necropsy should establish a list of differential diagnoses and theWe examined. WHOAS also supports the use of the Creative Commons licenses for original content. Seals, having also a terrestrial behaviour, are well known and perhaps lessIndeed, in case of mass strandings or epizooticsTo understandLesions must beIn addition to lesions, some tissues areThis sampling canIn addition, to prevent contamination byPhotographs should be takenA skin sample is taken forIn neonates, the umbilicusSampling forFrequently, theCare should be taken as the intestinal tract is easily torn. The organ isRenal tissue andContent is describedThe stomach can be rinsedNote any corporaIn pregnant females, the foetus is examined and sampledCysts content should be collected sterile syringe andTissue samples forAny lesion and allAs soon as possible, duringAny parasite is collected. Any parasite is collected. The hyoid bones are cut close to the skull. By this way,When fishes are present, theirThey are examined and sampled histopathology. To open the cavities,The strip of skin andThe left thoracicA rib can be collected for toxicology. Such openingAfter examination and sampling of tissues tongue,The lower jaw Acoustic fat is collected for histology.http://mkstudioweb.com/userfiles/70-5520-manual.xml

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This image reflectsThe dotted line illustratesIt is important to mention if the ear has been injected or notTo have access to the brain, the skull is sawed The pituitaryThe total bodyAbdominal cavity isSuch opening allows to have aThe lower jaw To have access to the brain,Nostril and air passage can beThe pituitary gland midventral part of theIt needs anIn touristic areas, like forOn site burying isTo date, there is no valid solution for on siteFor the necropsy,It should be considered potentiallyWhen material is not availableCoordinators scientific and technical should considerAs there are many unexpected characters of suchIn addition,It is usually performed on the beach nearBasic necropsy equipment for large cetaceans should beSo, it is important to have an updated checklistIt is useful to have phone lists toIn addition, for night work each personLarge cetaceansFor safety reasons, the number of people with directThe latter should limitOn some animals in advancedThe body can be dragged ashore at the maximum high tideAll parties involvedSimilarly, a debriefing after completion ofIt will allow to collect allIn case of a mass strandings of moreThis increases delay forIn addition to lesions, somePrecautions shouldPhotographsThe total body lenght is taken from mostThe blubber thickness Pictures areIn large maleAfter relieving the abdominal pressure to avoidThe skin andA strip of tissue is removed and the subcutaneousSome of theseIn such case, incisions are made alongThe intestine isCare should be takenIn pregnant females, the foetus is examinedCysts content should be collectedTissue samples for histopathology need toSuch investigation can be performed inAny lesion and all parasites should beIntestinal content is described when present. LigaturedAt first, itIf skeleton is not to be preserved,Alternatively, for a fast access to one lung, theThis may allowOtherwise, examination andAny parasite isAny parasite is collected. The hyoid bones are cut close to the skull.http://www.vos-web.nl/userfiles/70-290-lab-manual.xml

By thisWhen fishes areThey are examined and sampledIt is possible to collect brain tissueIt is possible to obtain theA predictive formula of normal weight WSimilarly, blubber thicknessAll those information are complementaryRit Fiskideilar. To which phylogenetic order do they belong Several species of Nocardia have been described from both captive and freeranging marine mammals of many species, both pinniped and cetacean. Diagnosis is usually postmortem, and most affected animals present with a systemic form of disease. Infections due to Actinomyces or Arcanobacterium spp are receiving considerable attention and have also have been diagnosed in many marine mammal species. Arcanobacterium phocae has been implicated in pathology in stranded California sea lion, common dolphin, gray seal, harbor seal, northern elephant seal, and sea otter. Arcanobacterium animalium has been isolated from harbour porpoise, To date, most cases are diagnosed postmortem, but the infection may be underreported. Two species have been classified B ceti cetaceans and B pinnipedialis seals. There appears to be host preferences. Transmission may be horizontal and vertical. The prevalences of marine mammal brucellosis are not known, but cases appear to be widespread. The role of environmental factors in the emergence of marine mammal disease is unknown. In one case, the cultured organism from the blood of a laboratory worker matched a marine mammal strain she was working with.All marine mammals are probably susceptible. The disease is characterized by acute swelling, muscle necrosis, and accumulations of gas in affected tissues, accompanied by a severe leukocytosis. Untreated, it can be fatal. Diagnosis is based on detection of grampositive bacilli in aspirates of the lesions and is confirmed by anaerobic culture and identification of the organism. Treatment includes systemic and local antibiotics, surgical drainage of abscessed areas, and flushing with hydrogen peroxide.

Commercially available inactivated clostridial bacterins are used routinely in some facilities, although efficacy in marine mammals has not been studied. Botulism has been reported in captive California sea lions during an endemic outbreak of the disease in waterfowl. Affected animals stopped eating and appeared unable to swallow several days before dying. Most cases of marine mammal pneumonia have significant bacterial involvement, and most organisms cultured from terrestrial species have been identified in marine mammals. Pneumonia often can be considered the result of mismanagement, although even in carefully managed captive animals pneumoniaassociated mortality is common. Marine mammals require good air quality, including high rates of air exchange at the water surface in indoor facilities. Tempered air or acclimation to cold temperatures is also important to prevent lung disease, even in polar species. Animals acclimated to cold temperatures are usually quite hardy; however, sudden transition from warm environments to cold air, even with warmer water, can precipitate fulminating pneumonias, particularly in nutritionally or otherwise compromised animals. Clinical signs include lethargy, anorexia, severe halitosis, dyspnea, pyrexia, and marked leukocytosis. The disease can progress rapidly. Diagnosis is usually based on clinical signs and confirmed by response to therapy, although bronchoscopy and fineneedle aspirates are being used more extensively to establish the cause of pneumonic disease in marine mammals. Treatment consists of correction of environmental factors and appropriate intensive antibiotic and supportive therapy. The organism, Erysipelothrix rhusiopathiae, which causes erysipelas in pigs and other domestic species, is a common contaminant of fish. A septicemic form of the disease in marine mammals can be peracute or acute; affected animals die suddenly either with no prodromal signs or with sudden depression, inappetence, or fever.

A cutaneous form that causes typical rhomboidal skin lesions is a more chronic form of the disease. Animals with this form usually recover with timely antibiotic treatment. Diagnosis is based on culture of the organism from the blood, spleen, or body cavities. Arthritis has been found in animals that have died with the chronic form. Animals with the dermatologic form usually recover with administration of penicillins, tetracyclines, or chloramphenicol and supportive treatment.

Vaccination is controversial, and vaccine breaks can occur. Vials of killed erysipelas bacterin should be cultured for surviving organisms before use in marine mammals. Modifiedlive bacterins should be avoided for the initial vaccination. Fatal anaphylaxis can occur on revaccination. For this reason, some vaccination programs have been reduced to onetime administration even though antibody titers fall below the presumed effective level. Hypersensitive animals develop swelling and redness at the injection site within 30 min. Bacterin should be administered in the dorsal musculature anterior and lateral to the dorsal fin. Administration posterior to the dorsal fin can result in a severe tissue reaction, immobilizing the animal for several days. To maintain high antibody titers, a booster after 6 mo and annual revaccination are required. In seals, the disease is characterized by depression, reluctance to move, polydipsia, and pyrexia. It may also cause abortions and neonatal deaths in California sea lions and Northern fur seals. Lesions include a severe, diffuse, interstitial nephritis, with renal tubules packed with spirochetes. The gallbladder may contain inspissated black bile, but hepatitis may not be apparent grossly. Hyperplasia of Kupffer cells, erythrophagocytosis, and hemosiderosis are seen histologically. Gastroenteritis can be a feature.

Antibodies to various Leptospira serovars including L Canicola, L Icterohaemorrhagiae, L Autumnalis, and L Pomona have been identified in many species, including sea otters and manatee. Treatment in pinnipeds is similar to that in dogs see Leptospirosis in Dogs . Control in captive animals requires serologic examination of new animals during quarantine. Captive animals can be vaccinated in endemic areas. Leptospirosis is zoonotic, and appropriate precautions should be taken. It must be distinguished from sealpox. Simultaneous infections of streptothricosis and pox have been recorded in sea lions. Cutaneous streptothricosis usually manifests as sharply delineated nodules distributed over the entire body and usually progresses to death. Diagnosis is based on demonstration of the organism in biopsies or culture. Treatment with prolonged high dosages of systemic antibiotics can be successful. Evidence points to mycobacterial disease being possibly endemic in freeranging otarids off the coast of Australia. Originally thought to be caused by Mycobacterium bovis, subsequent molecular assessment places the isolates from freeranging southern hemisphere pinnipeds in a unique cluster assigned its own species in the M tuberculosis complex. Subantarctic fur seals Arctocephalus tropicalis are thought to be the common link in the spread of M pinnipedii to other pinniped species because they cohabit with the other known affected species, Australian sea lions Neophoca cinerea and New Zealand fur seals Arctocephalus forsteri . Otherwise, mycobacteriosis has been a disease of captivity. Pinnipeds, cetaceans, and sirenians have developed disease due to M bovis, M smegmatis, M chitae, M fortuitum, M chelonae, and M marinum. Cutaneous and systemic forms are seen. There are strong indications that immunosuppression may be involved in development of infections by the atypical mycobacteria. In pinnipeds, injections in the webbing of the rear flippers should be read at 48 and 72 hr.

ELISA screening has identified antibodies in seals but requires further evaluation before it can be considered a screening test. Diagnosis is made by culture and identification of the organism from lesion biopsies, tracheal washes, or feces. Mycobacteriosis in marine mammals is an emerging disease and is possibly of public health significance. Also see Tuberculosis and other Mycobacterial Infections. They have been associated with respiratory disease historically but can be found in healthy animals. They are frequently cultured from animals concurrently infected with respiratory viruses. Pasteurella multocida has caused several outbreaks of hemorrhagic enteritis with depression and abdominal distress, leading to acute death in dolphins and pinnipeds. It has also been reported to cause pneumonia in pinnipeds. In dolphins, Mannheimia haemolytica has been incriminated in hemorrhagic tracheitis that responded to chloramphenicol therapy. Burkholderia pseudomallei has caused serious fatal outbreaks of disease in various marine mammals in captivity in the Far East. Salmonella spp have caused fatal gastroenteritis in manatees and beluga whales. Staphylococcal septicemia has caused the death of a dolphin with osteomyelitis of the spine

pyogenic spondylitis. Another case of intradiscal osteomyelitis, due to Staphylococcus aureus, was treated successfully with a prolonged course of cefazolin sodium and cephalexin. S aureus also has been incriminated in a fatal pneumonia in a killer whale. Vibrio spp infect slowhealing wounds of cetaceans managed in open sea pens. From developing new therapies that treat and prevent disease to helping people in need, we are committed to improving health and wellbeing around the world. The Merck Veterinary Manual was first published in 1955 as a service to the community. The legacy of this great resource continues as the Merck Veterinary Manual in the US and Canada and the MSD Manual outside of North America.

To which phylogenetic order do they belong Clinical experience with many of these is limited, whereas others are commonly seen in recently captured specimens. Bolbosoma spp have been reported in pinnipeds. C enhydra has only been reported from sea otters. Diagnosis is by detection of eggs in feces, but clinical disease and therapy are not well documented. Three species of Profilicollis also found in birds are reported to cause peritonitis associated with intestinal perforation in sea otters. Mortality usually occurs before the parasite produces ova. Premortem diagnosis is problematic. No successful treatment has been reported. Lung mites cause rattling coughs. Nasal mites cause nasal discharge but apparently little discomfort. Diagnosis is made by identifying the mite in nasal secretions or sputum. The life cycles of these mites are not completely known. Treatment of infected animals eliminates the problem in captive enclosures without environmental treatment. Mites have been associated with large, roughened lesions of the laryngeal area of cetaceans, but their overall significance or treatment is unknown. Nonpruritic, alopecic lesions with hyperkeratosis, scaling, and excoriation develop on the flippers and other body surfaces that contact the substrate. Diagnosis is made by deep skin scrapings and identification of the mite. Secondary bacterial infection that results in pyoderma is seen in chronic cases. Treatment is the same as in dogs see Mange in Dogs and Cats . Predisposing factors in pinnipeds are unknown. The mites are not readily transmitted among contact animals. The lice can be seen grossly and are readily transmitted. They are highly sensitive to ivermectin as well as to chlorinated hydrocarbon insecticides. Rotenone powder is also effective. Animals in captivity can be freed of parasites if no new sources of infestation are introduced. Sea lions have Parafilaroides decorus, whereas true seals are usually parasitized by Otostrongylus circumlitus.

The latter parasite is also found in the hearts of some phocids; however, it does not produce a microfilaremia. Both of these parasites use fish as intermediate hosts. There are at least four species of lungworms in various cetacean hosts, including Halocercus lagenorhynchi, which has caused prenatal infections in Atlantic bottlenose dolphins. Anorexia, coughing, and sometimes bloodflecked mucus are the first signs of pulmonary parasitism. Treatment of P decorus infection consists of mucolytic agents administered intratracheally, antibiotics to treat any concomitant bacterial pneumonia, ivermectin, and concurrent prednisone or dexamethasone. Diagnosis of O circumlitus in elephant seals is complicated by mortality occurring after generalized clinical signs of depression, dehydration, and neutrophilia before the parasites become patent and firststage larvae can be detected in sputum or feces. Cetacean lungworms probably are also susceptible to levamisole and ivermectin; however, the sudden deaths of two beluga whales injected IM with levamisole phosphate suggest this drug administered by that route may be contraindicated. A percentage of pinnipeds also show neurologic reactions to IM injection of levamisole; PO or SC administration has been recommended. In captivity, lungworm infections are usually selflimiting if larvae are not introduced in fresh fish intermediate hosts. Feeding frozen fish prevents reinfection. Phocid seals are affected by A spirocauda, and otarids are infected subcutaneously by A odendhali. Transmission of A spirocauda is thought to be by the seal louse Echinophthirius horridus . Both groups of pinnipeds can be infected with the canine heartworm, Dirofilaria immitis, in endemic areas; however, phocid seals are abnormal hosts. Dirofilariasis is diagnosed by identifying microfilariae in the blood. Transmission is thought to be by the same mosquitoes that bite dogs.

Granulomas form at their attachment sites and can lead to blood loss, ulceration, and ultimately perforation and peritonitis. Raw fish is most often incriminated as the source of infection. Infections with Contracaecum spp are common in wild cetaceans and pinnipeds. Polar bears in captivity are prone to heavy ascarid infection. Ivermectin may be considered. Severe infections are known in fur seals. Newborn fur seal pups are infected via colostrum.Successful treatments are not documented but are potentially possible with systemic parasiticides. The dual intermediate host requirement of these species in captivity usually means these infections are selflimiting. Other cestodes commonly seen include D lanceolatum in phocid seals, Diplogonoporus tetrapterous in all pinnipeds, and Tetrabothrium forsteri and Strobilocephalus triangularis in cetaceans. Cetaceans are also commonly infected with subcutaneous tapeworm cysts throughout the blubber. These usually are the larval forms of tapeworms of sharks. Several species of cestodes are reported in sea otters and polar bears but are not known to have clinical significance. Ova of these trematodes have been associated with necrotic foci in the brains of animals showing behavioral aberrations and have been incriminated as a cause of localized pneumonia in cetaceans. Infections are often accompanied by halitosis and brown mucus around the blowhole and occasionally by coughing. Diagnosis is based on demonstration of typical operculated trematode ova in blowhole swabs or feces. Reinfection can be prevented by not feeding fresh or live fish. Signs are usually seen in adults and include icterus, lethargy, and anorexia. Bilirubinemia and increased serum hepatic enzymes are common. Diagnosis is based on identification of trematode ova in the feces.Pancreatic fibrosis due to trematodiasis is a common necropsy finding.

Clinical disease with this parasite is thought to be rare unless the host is stressed through capture, handling, or husbandry changes. At least two new species of intestinal coccidia have been identified in California sea lions. A coccidian, Cystoisospora delphini, has been reported as the cause of enteritis in bottlenose dolphins; however, some consider the parasite to have been a fish coccidia not associated with the disease. E trichechi reported from the Amazonian manatee Trichechus inunguis , and E nodulosa reported from the Florida manatee, are also not associated with disease. These coccidia are probably susceptible to anticoccidial drugs used against other species, eg, amprolium. Also see Coccidiosis. Infection can be asymptomatic or cause severe encephalitis characterized by generalized neurologic signs. No successful treatment of neurologic cases has been reported. Sarcocystis spp have been found in the muscles of many cetacean, otarid, and phocid species and are often not associated with any recognized clinical signs.Fatal meningoencephalitis due to T gondii has also been reported in a Florida manatee and disseminated disease in Antillean manatees. Toxoplasma spp encephalitis is also reported in harbor seals and Northern fur seals. Disseminated toxoplasmosis is reported in California sea lions. T gondii is reported from Atlantic bottlenose, Risso’s Grampus griseus , striped Stenella coeruleoalba , and spinner dolphins, and serologic evidence of toxoplasmosis is being discovered in an everwidening array of marine mammal hosts, including polar bears. No successful treatment has been reported. Transplacental transmission has been reported in a Rissos dolphin. From developing new therapies that treat and prevent disease to helping people in need, we are committed to improving health and wellbeing around the world. Just click here.Proceedings from 20032013 are currently available.

Over the next year, well be adding to the archive so that, in time for the IAAAM Conference in 2013, the entire archive from 1968 to present day will be accessible online. After that 6 months, the proceedings will be added to the archive, allowing this unique content to be available to the wider scientific community. The titles displayed in the Table of Contents may be abbreviated. To view a particular article, and the full article title, click the title of the presentation.Just click here. Action items 1. Evaluate marine mammal and sea turtle stranding data to help environmental managers identify trends; 2. Integrate stranding data with population and health assessment data to provide insight into environmental changes due to anthropogenic causes and climate change; 3. Conduct population monitoring of marine mammals and sea turtles through surveys, satellite tracking, and

health assessment projects; 4. Support stranding response with the operation of the Specially Trained Animal Response Team START for outofhabitat situations, unusual mortality events UMEs, entanglements, and natural and manmade disasters, including oil spills, as well as provide marine mammal and sea turtle necropsies and supportive care for cold stunned sea turtles in New York; and 5. Engage the public about marine conservation and how their actions impact the environment, which includes having the public participate in beach clean ups and beach patrols for sick or cold stunned sea turtles. Conservation means the wise use of the earth and its resources... for the greatest good for the greatest number for the longest time Gifford Pinchot 1947 ACTION PLAN 1. Data Research To compile and evaluate stranding data in New York over the last two and half decades in order to i. generate reports on occurrences and changes in strandings over the history of the program and relate those changes to environmental changes; ii.

establish a best practices manual for satellite tagging on rehabilitated animals; and iii. identify future strategies to integrate stranding data and health assessment data. 2. Surveys and Health Assessments To conduct surveys and health assessments on marine mammals and sea turtles. These data will be combined with stranding data to give a full representation of the population. We will develop a program that looks at both wild and stranded animals and attempts to understand the impacts of climate change. Members of AMCS have recently conducted two research projects involving surveys on marine mammals and sea turtles in the midAtlantic region. We plan to submit a request for a research permit to perform sea turtle captures in the New York Bight and surrounding waters to conduct health assessments. The data from our land, sea, and aerial survey work will be used as baseline for future population assessments. By combining our surveys with tracking data, we also intend to work on correction factors needed for seal haulout behavior. 3. Specially Trained Animal Response Team START To continue to operate and support the START program and train our members in Incident Command System ICS and assist other stranding network participants faced with emergent care situations. Training members in HAZWOPER and oil spill response will be a significant goal of our program preparation. 4. Out of Habitat, Entanglements, and Disasters To respond to dead marine mammals and sea turtles and conduct highend necropsies on the animals with the most scientific value. Team members from our organization have extensive experience dealing with outofhabitat situations related to seals, whales and dolphins. Our team will continue to train and develop Incident Action Plans IAP for dealing with these unusual events building on prior lessons learned. Our team members have responded to numerous entangled sea turtles, specifically the endangered leatherback sea turtle.

The occurrence of entanglements in New York waters has dramatically increased in the past few years. Having a team able to respond to these unique situations is crucial in this changing environment. As noted, oil spill response training will be incorporated into our team structure to ensure teams are better prepared for major events. Members of our team participated in the clean up efforts following the Deepwater Horizon disaster in the Gulf of Mexico in 2010. We will be trained in accordance with the oil spill guidelines released by NOAA in December 2015 NOAA Technical Memorandum NMFSOPR52. We intend to work closely with the Area Planning Committees and the Regional Response Team to incorporate marine mammal and sea turtle response into their programs. We would also like to build on our working relationship with the NYSDEC oil spill response program to facilitate a quick response when animals are encountered. 5. Necropsies We will develop a stranding response necropsy manual to be used in major events. Our standing protocol will be to conduct necropsies on site when possible and use each opportunity as a training exercise for larger events. Once our organization is notified of a carcass on the beach, we will assemble a team to assess the animal and collect basic data. If the animal is of high value or in good condition for necropsy, plans will be made to conduct a more extensive examination. Our team has extensive experience responding to dead large whales on the beach and will work with local officials and NOAA to secure the animals and conduct forensic investigations on these animals. 6. Public

Outreach To conduct outreach lectures to the public, in schools, and for local officials about what to do in the event of a marine mammal or sea turtle encounter. We will also educate the public about the changes in the environment and how they can help.

This project aims to acquire high quality photogrammetry of marine mammals, especially large whales, to acquire total length and length to width ratios to accurately assess body condition. Samples of exhalate from the same animals, analyzed for a range of metabolic and microbiological parameters holds the promise of diagnosing possible reasons for observed variability in body condition. Many of these cases are found on the beaches of Cape Cod. Dr Moore provides veterinary services to IFAW MMRR. With permission from the journal editor a preprint of an article in the Journal of Cetacean Research and Management describing right whale mortalities for the period 1970 to 2002 can be downloaded We believe this indicates that such diving mammals are routinely supersaturated, and that they avoid clinical decompression sickness behaviorally. With support from the Office of Naval Research we are developed tools to study the underlying basis for these observations, by building a hyperbaric chamber compatible with a CT scanner, and by developing protocols for the use of Veterinary Ultrasound on live stranded marine mammals. See Moore M, Hammar T, Arruda J, Cramer S, Dennison S, Montie EW, Fahlman A 2011 Hyperbaric computed tomographic measurement of lung compression in seals and dolphins. Journal Experimental Biology 21423902397 This should establish a better understanding of the force required for lethality in such a collision. Journal of Zoo and Wildlife Medicine vol. 393755 Technical reports for this program can be obtained at Findings of significant bone lesions in certain bones lead us to compare that animal with others in museums on the US East coast. Our findings have been published in Science 2004 3062215. ABSTRACT TEXT The sperm whale from Nantucket that we examined is on public display at the New Bedford Whaling Museum Sperm whale dives last about an hour, but can be up to 2 hours and they go to 12000m in depth.