CRC Handbook of Marine Mammal Medicine
Second Edition

Edited by Leslie A. Dierauf and Frances M. D. Gulland

CRC Press
Boca Raton  London  New York  Washington, D.C.
Introduction

Reports of transmission of disease from marine mammals to humans are scarce; however, as humans are increasingly in contact with marine mammals, the possibility of encountering new diseases must be considered (Tryland, 2000). Lack of reports in the literature may indicate lack of occurrence of disease, but may also reflect lack of recognition by physicians or failure to report for a variety of reasons. Until recently, only hunters and scientists were likely to have close physical contact with marine mammals, and the public’s exposure was limited to zoos or aquaria with animals behind barriers. However, in the last decade, human contact with marine mammals has changed so that a broader range of people are potentially exposed to zoonoses.

Sophisticated oceanaria have improved housing for marine mammals, and inner-city aquaria bring education opportunities and tourism dollars into urban restoration projects. The display animals in oceanaria are generally healthy, and their care is well regulated, for the benefit of both the animals and the humans they contact. However, they may carry infections that are not apparent as clinical disease. Many facilities now feature interactive programs, allowing the public to feed and/or pet the trained performers, thus increasing the degree of contact between marine mammal and humans. Increasing public interest in marine mammals has resulted in the emergence of popular “swim-with-the-dolphin or manatee” programs (see review by Samuels et al., 2000). These programs offer tourists and, in some cases, handicapped children, the opportunity to encounter free-ranging dolphins or manatees, or those in large, ocean-connected enclosures. The wild dolphins are presumed healthy, but are not usually subject to routine veterinary care. Appealing as they might be, wild animals are indeed wild, and the possibility of injury and disease transmission is always present. Also, the dolphins, while healthy themselves, may harbor organisms as part of their normal flora that may be potentially pathogenic to humans. Another recent development is the formation of centers and networks dedicated to the collection and rehabilitation of stranded marine mammals. Wild animals are often infected with parasites and other potential disease agents, including viruses, bacteria, protozoa, and fungi. Workers in programs for the rescue and rehabilitation of stranded marine mammals are exposed to animals that must be presumed sick. Most rescue programs rely heavily on volunteers who donate a few hours a week, so the number of individuals exposed to stranded animals is considerable. The training volunteers receive varies from facility to facility, and avoiding injury and exposure of the volunteers is variably successful. Handlers supporting sick animals in small pools are exposed to water that may quickly become contaminated with urine.
and feces. However, perhaps the most likely situation for transmission of disease from marine mammals to humans is during the post-mortem examinations of large whales. During such operations, humans may be literally immersed in a marine mammal, exposing mucous membranes and cut surfaces to a variety of potential pathogens.

These increasing contacts between humans and marine mammals raise significant public health issues, as it is not just theoretically possible for humans to contract infection from marine mammals. For example, in one survey of a sealing fleet, 10% of the crew was affected by seal finger (Rodahl, 1953). Handlers of marine mammals may be at some risk of exposure to parasite ova from fish fed to marine mammals, or from ova in the stool of the mammals (Meyers, 1970). Direct transmission of metazoan parasites from marine mammals to humans is probably not a serious consideration, because of the complex life cycles of parasites, but direct or indirect contact with viruses, bacteria, protozoa, and fungi may result in human infection. This chapter addresses known pathogens associated with marine mammals, certain infectious diseases of marine mammals, and human diseases that are known to be, or may be, caused by transmissible agents from marine mammals. Although at this time, with a few exceptions, transmission may seem to be hypothetical, awareness of risk and taking of appropriate precautions may prevent the hypothetical from becoming the actual.

**Viral Infections**

**Poxviruses**

Humans may acquire parapox virus infections through contact with seals with seal pox (see Chapter 15, Viral Diseases). The first clinical symptom is observed 10 to 20 days postexposure. A red area (a macule) appears and typically persists for 24 hours, progressing into a papule with a raised pale center, reflecting edema. This may further progress to a vesicular stage. The delicate vesicles often rupture, particularly when they occur in areas subject to abrasion. After a few days, the papule or vesicle becomes a pustule as leukocytes accumulate in the lesion. The pustule dries up over a period of 1 to 5 weeks and an eschar scab is formed. However, lesions may persist for several months or as long as a year before healing is complete (Hicks and Worthy, 1987).

The lesions and scabs contain infectious virus and are the source of new infections of animals and humans. Even dried scabs may contain viable virus for months. Seal pox virus has been isolated from both the host animals and their human contacts (Hicks and Worthy, 1987). Stranded seals, which are often stressed, poorly nourished, and heavily parasitized, frequently exhibit clinical seal pox. Seal pox infections can spread within a stranding center with overcrowded conditions, as sanitary and quarantine measures are difficult to achieve (see Chapter 41, Seals and Sea Lions). Volunteers rescuing and treating stranded seals should wear gloves whenever handling animals. Although human-to-human transmission of seal pox has not been reported, care should be taken to prevent exposure. There is no treatment for seal pox infection other than topical supportive care to prevent complications.

**Calicivirus**

There is a single report of a laboratory worker who showed a deep skin lesion after working with a marine calicivirus, San Miguel sea lion virus (SMSV) serotype five (Smith et al., 1978a,b). Co-workers developed rising titers to additional serotypes of this group of viruses. SSMVs are marine caliciviruses common in both fish and marine mammals in the Pacific Ocean (Smith et al., 1983) (see Chapter 15, Viral Diseases). These viruses, of which there are 18 or more
serotypes, cause vesicular lesions in the mouths and on the flippers of California sea lions 
(Zalophus californianus). The first isolations were reported from California sea lions on San 
Miguel Island in 1973 (Smith et al., 1973).

SMSVs have been shown to cause vesicular exanthema of swine (VES), a disease first recognized 
in the United States in 1932. A recent isolate from California sea lions was shown experimentally 
to infect swine and cause a disease indistinguishable from VES (Van Bonn et al., 2000). VES 
was eradicated in the United States in the late 1950s after requirements for cooking garbage 
fed to swine were implemented. It should be noted that during the national eradication program, 
there were no reports of human infection, even though tens of thousands of VES-infected pigs 
were slaughtered. In addition, Alaskan natives handling SMSV-infected seals did not develop 
disease or antibody titers after harvesting infected seals (Smith et al., 1978a). The lack of disease 
and antibody in people who were heavily exposed places this group of viruses low on the scale 
of probable zoonotic agents.

Influenza

Both humans and marine mammals are susceptible to infection with avian-origin influenza 
viruses. Four people developed conjunctivitis after post-mortem examination of infected seals, 
and one person developed conjunctivitis caused by influenza A/seal/Mass/1/80(H7N7) after a 
harbor seal (Phoca vitulina) sneezed on him (Webster et al., 1981a,b). A reciprocal case, human 
sneezing on seal, is theoretically possible. Recently, influenza B was isolated from harbor seals 
in the Netherlands, several years after a human epidemic (Osterhaus et al., 2000) (see Chapter 
15, Viral Diseases).

Rabies

Rabies virus infects many animals, including humans, with high mortality in unvaccinated 
individuals. The first and only documented case in a marine mammal occurred in a ringed 
animal demonstrating neurological signs should be treated with appropriate precautions. 
Morbilliviruses, which cause the distempers, also produce neurological signs in seals, dolphins, 
porpoises, and a wide range of other cetaceans, but these marine morbilliviruses have not been 
shown to be infectious to humans, although some other morbilliviruses are.

Bacterial Infections

Many bacterial species are found in marine waters and may be recovered from marine mam-
mals, either as pathogens or as part of a complex normal flora. Bacterial infection is thought 
.to be the main cause of disease and death in marine mammals, especially in captivity (Howard 
et al., 1983). The vast majority of bacteria associated with marine mammals are not of public 
health concern (see Chapter 16, Bacterial Diseases). However, a few are known pathogens of 
humans and some could be adventitious infectious agents for persons with compromised 
immune systems, or may be inoculated into bites, cuts, or abrasions.

Vibrio spp.

Marine organisms known to produce severe or fatal infections in humans include the halophilic 
Vibrio spp. (V. fdiificus, V. parahemolyticus, V. damsel, V. cholerae, V. fluvialis, V. pelagius, 
V. furnissi, V. alginolyticus, V. metchnikovii, V. gazogenes, V. mimicus, V. holilus) (Fujioaka et al., 
1988; Buck and Schroeder, 1990; Woods and Guiterez, 1993), and Edwardsiella tarda (Janda and
Abbott, 1993). These organisms are common in the marine environment and are frequently encountered in cetaceans (Howard et al., 1983; Cowan et al., 1998), but are less often encountered in pinnipeds (Johnson et al., 1998; Thornton et al., 1998). *Vibrio* infections are frequently mixed. Three clinical syndromes in human infection have been identified: gastroenteritis, wound infection, and primary septicemia. In one survey of human cases in Florida, gastroenteritis accounted for about half of all cases, wound infection about a quarter, and about 17% were primary septicemia. Wound infection and septicemia are highly seasonal, April through October (at least in Florida), relating to the seasonal abundance of *V. vulnificus* and *V. parahaemolyticus*. Wound infections are largely occupational, occurring in people who fish and others working around the water, whereas 68% of cases of gastroenteritis and 83% of cases of septicemia were associated with ingestion of raw oysters. Septicemia is clearly associated with preexisting conditions (Hlady and Klontz, 1996). Middle ear infections, especially with *V. alginolyticus* and *V. parahaemolyticus*, may be acquired from exposure to contaminated seawater, especially if the patient has a perforation of the tympanic membrane (Hornstrup and Gahrn-Hansen, 1993).

**Edwardsiella spp.**

Only one of the three species of *Edwardsiella, E. tarda*, is known to be pathogenic for humans, causing gastroenteritis, wound infection (cellulitis and gas gangrene), septicemia, meningitis, cholecystitis, and osteomyelitis. Infection is usually attributed to exposure to the aquatic environment, exotic animals, including marine mammals, reptiles, and amphibia, and eating raw fish. As with *Vibrio* infection, preexisting liver disease, iron overload, and immune impairment predispose to infection (Janda and Abbott, 1993).

**Clostridium spp.**

The *Clostridium* spp. are spore-forming obligate anaerobic bacilli, ubiquitous in the environment in soil, sewage, marine sediments, decaying animals and plant products, and the intestinal tracts of many animals. Although more than 80 species are known, those implicated in human disease include *C. botulinum, C. tetani, C. perfringens, C. difficile, C. sordelli, C. novyi, C. histolyticum, C. septicum, C. bifermentans, C. sporogenes, C. tertium, C. ramosum, C. butyricum*, and *C. baratyi* (Woods and Guitierrez, 1993). In human medicine, most disease is toxic or enterotoxic, related to *C. botulinum* and *C. difficile*; however, in the context of this discussion, the main risk would seem to be wound infection. Many species of *Clostridium* have been cultured from blood, lesions, and intestinal tract of stranded bottlenose dolphins (*Tursiops truncatus*) in the Gulf of Mexico (Cowan et al., 1998) but appear less common in California pinnipeds (Thornton et al., 1998).

**Leptospira**

Leptospirosis occurs in harbor seals (Stamper et al., 1998; Stevens et al., 1999), California sea lions, and northern fur seals (*Callorhinus ursinus*) (Gulland, 1998). It should be noted that veterinarians and veterinary technicians have been made ill through contact with fluids and tissues during necropsy of sea lions infected with *L. interrogans pomona* (Smith et al., 1978b).

**Streptococcus**

β-Hemolytic streptococci (Lancefield group L) have been identified as playing an important role in infections of harbor porpoise (*Phocoena phocoena*) of the North and Baltic Seas (Swensson et al., 1998). While Lancefield group L are well known as pathogens of a variety of animals, causing mastitis and various infections, they have only rarely been recognized as causing
infections of humans. These infections may include bacteremia and endocarditis in debilitated persons (Ellen, 1970; Bevanger and Stannes, 1979) and cellulitis, wound infections, impetigo, and paronychia in meat handlers (Barnham and Neilson, 1987).

**Brucella**

*Brucella* infection of the placenta with abortion has been reported in bottlenose dolphins. The organism, *B. delphini*, appears to be readily transmissible among dolphins, and has also been cultured from the lung of a bottlenose dolphin at necropsy (Miller et al., 1999). *Brucella* infection occurs in other cetaceans and seals (Ross et al., 1996). A substantial percentage of marine mammal serum samples (about 30%) react positively on tests used to detect antibody to *Brucella* spp., and a number of *Brucella* isolates have been obtained from marine mammals. However, only *B. delphini* has been associated with reproductive failure in marine mammals. One laboratory worker in the United Kingdom became ill when handling a marine *Brucella* isolate, and responded positively to a 6-week course of rifampin and doxycycline (Brew et al., 1999).

**Erysipelothrix rhusiopathiae**

Red indurated patches on the skin of marine mammals or humans may indicate infection with *E. rhusiopathiae/insidiosa*. In humans, the disease is generally localized and is called erysipeloid. (Do not be confused by the term *erysipelas* in the human literature, which is a superficial cellulitis caused by Group A β-hemolytic streptococci.) In classic cases of disease caused by *E. rhusiopathiae*, a diamond pattern on the skin may be observed. Typical clinical signs of erysipelas are swelling and pain, but more generalized illness (polyarthritis, septicemia, or pneumonia) is also recognized (Medway, 1980; Woods and Gutierrez, 1993). *Erysipelothrix rhusiopathiae* was once thought to be the cause of seal finger, but new evidence and antibiotic-resistance patterns implicate *Mycoplasma* as the probable cause. The Gram-positive or Gram-variable organism *E. rhusiopathiae* is readily isolated from fish, so the source of infection for persons working with marine mammals may be fresh or frozen fish used for feed. Broad-spectrum antibiotics are generally effective in treating the disease.

**Mycobacterium spp.**

*Mycobacterium marinum* (syn. *M. platypneustes, M. bacteii*), originally described from fish, was first recognized as a human pathogen in 1951 (Norden and Linell, 1951). *Mycobacterium marinum* has been reported to have been transmitted to a handler by a dolphin bite (Flowers, 1970). The handler was bitten on a finger during a training session. About 2 months later, firm fluctuant swellings appeared in the vicinity of the original wound. Viscid pus was aspirated from one lesion. Cultures taken then and a month later yielded pure growth of *M. marinum*. The lesions healed over several months. Infections with *M. marinum* are uncommon, but are described in the literature (Woods and Gutierrez, 1993). They tend to heal spontaneously but may take up to 2 years to do so. Most inoculations are on the elbow, knee, foot, toe, or finger, and lesions may be verrucose or ulcerated. Extracutaneous manifestations are rare, and include synovitis, osteomyelitis, and ocular and laryngeal lesions; in immunocompromised persons, the disease may become disseminated (Woods and Gutierrez, 1993).

*Mycobacterium bovis* has been reported to cause pulmonary tuberculosis in a seal trainer. Cultural characteristics, biochemical reactions, sodium dodecyl sulfate polyacrylamide gel electrophoresis, and restriction endonuclease analysis linked his infection to three seals with which he had worked 2 years earlier. None of the seals was overtly sick despite post-mortem findings showing
extensive tissue involvement (Thompson et al., 1993). Mycobacterium tuberculosis was diagnosed in a captive colony of mixed pinnipeds by pathology, culture, and tuberculin skin testing (Forschaw and Phelps, 1991). It was also diagnosed in wild pinnipeds that stranded off Australia and Argentina (Romano et al., 1995; Woods et al., 1995). An instance of disseminated M. chelonei infection in a manatee (Trichechus inunguis) has also been reported (Boever et al., 1976). Howard et al. (1983) cite cases of cutaneous mycobacteriosis in a manatee and its handler, attributed to M. chelonei.

**Coxiella burnetii**

There is an interesting report that the causative agent of Q fever (C. burnetii) was identified in the placenta of a Pacific harbor seal (Phoca vitulina richardsi) (Lapointe et al., 1999). The animal was euthanized because of protozoal encephalitis, and the intracellular Gram-negative bacteria were found during a histopathological study of the tissues collected at necropsy.

**Other Mixed Infections**

The most common organisms identified in two surveys of bacterial isolates from collection and stranded marine mammals, apart from coliforms, were Clostridium (eight species, 21 isolates), Vibrio (eight species, 51 isolates), Citrobacter (two species, ten isolates), and Edwardsiella tarda (five isolates) (Howard et al., 1983; Cowan et al., 1998). The majority of these species are known to be pathogenic or potentially pathogenic for humans. In another study, 21 different species of bacteria were cultured from dolphins living in ocean pens in southern California (Johnson and Fung, 1969). These included six species of Pseudomonas, two Proteus, three Streptococcus, two Staphylococcus, and Edwardsiella tarda, among others. This is in contrast to experience with pinnipeds from the California coast, in which the major pathogens encountered in sea lions, elephant seals (Mirounga angustirostris), and harbor seals are enteric organisms, mainly Escherichia coli, Klebsiella pneumoniae, K. oxytoca, Proteus spp., Pseudomonas spp., and Enterococcus spp., as well as nine different serotypes of Salmonella (most commonly S. newport), β-hemolytic streptococci, and Staphylococcus aureus. Infection with Vibrio spp. and Clostridium spp. was less common, while infection with Listeria ivanovii, not recognized on the Gulf Coast, was especially prevalent in lesions from harbor seals (Johnson et al., 1998; Thornton et al., 1998).

Other bacterial infections reported in marine mammals are Pseudomonas mallei (many species), P. pseudomallei [many species, notably an epizootic of melioidosis of dolphins, pilot whales (Globicephala spp.), and harbor seals in Hong Kong], Pasteurella multocida (California sea lion), Neisseria spp. (dolphins), Nocardioides asteroides (pilot whale), N. brasiliensis (bottlenose dolphin), N. spiro檢衣 (bottlenose dolphin), N. paraguayensis (dolphin) (Medway, 1980), and actinomycosis (Sweeney et al., 1976). However, none of these has as yet been associated with disease of humans as a result of transmission from a marine mammal.

**Mycoplasma Infections**

The most common serious ailment associated with bites from seals or sea lions is seal finger, also called spaceck finger, sealers' finger, speck finger, or blubber finger (Candolin, 1953). A mycoplasma, M. phocacerebræ, was isolated in 1990 from both the front teeth of a healthy seal and the finger lesion of a woman it had bitten at the New England Aquarium in Boston, Massachusetts (Madoff et al., 1991; Stadtlander and Madoff, 1994). The organism was originally isolated from diseased seals in 1988 from the North Sea and the Baltic Sea (Giebel et al., 1991; Baker et al., 1998). Koch's postulates are not satisfied at this time, so there is only circumstantial evidence that seal finger is caused by one or more mycoplasmas that may be present in both healthy and sick seals.
In one survey in 1950, over 10% of a Norwegian scaling fleet was affected with seal finger (Rodahl, 1953). Usually within 1 to 8 days, but up to 21 days later, the area around the puncture wound becomes markedly swollen and extremely painful, with the joint nearest the wound becoming inflamed and immobile. The skin may become dark and discolored, but there is less erythema than in erysipelas (Mass et al., 1981). Recurring and worsening symptoms, regional lymphadenitis and lymphadenopathy (Sargent, 1980), demineralization of the bone, and loss of mobility and permanent disability (Mass et al., 1981) may result without effective treatment. Seal finger may also be transmitted by a cut from a contaminated knife, or from infection of previously existing open wounds. There is no evidence of transmission to humans from frozen infected seal tissues. Penicillin is not effective in treating seal finger. Tetracycline, 150 to 500 mg four times per day for as long as 4 to 6 weeks (Mass et al., 1981), or doxycycline at 200 mg/adult loading dose, followed by 100 mg/day (Gulland, pers. comm.) is recommended.

Fungal Infections

A large number of fungal species have been recovered from marine mammals (see Chapter 17, Mycotic Diseases). Opportunistic fungi identified in marine mammals include Candida albicans, other Candida spp., Aspergillus fumigatus, Cryptococcus neoformans, Chalophilophora bantiana, Apophysomyces elegans, Sakalanae vasiformis, Mucor, Rhizopus, and other Zygomycetes, and Fusarium spp. Primary (endemic) pathogens include Blastomyces dermatitidis, Coccidioides immitis, Histoplasma capsulatum, and Lecazia loboi (Medway, 1980; Migaki and Jones, 1983; Cowan et al., 1998; Jensen et al., 1998; Reidarson et al., 1999; Wunschmann et al., 1999; Haubold et al., 2000). Animals with immune suppression from morbillivirus disease may suffer severe, disseminated fungal infection, frequently from Aspergillus spp., as a terminal event. An unusual, perhaps unique case of disseminated sporotrichosis (Sporothrix shenckii) has been reported in a Pacific white-sided dolphin (Lagenerhynchus obliquidens) (Migaki et al., 1978). Dermatophytosis caused by Epidermophyton floccosum has been reported in manatees (Dibone, 1965) and Microsporum canis has been recovered from scaling, pustular lesions in a harbor seal (Farnsworth et al., 1975).

Since infection with fungi requires spores from the environment, rather than the vegetative stages found in marine mammals, direct transmission to humans from animals seems unlikely. To date, only one instance of direct association of transmission of a fungus infection from a dolphin to a human has been reported. This is a case of Lobo's disease transmitted from a captive bottlenose dolphin to a handler (Symmers, 1983). Lobo's disease (once called keloidal blastomycosis) is a skin infection producing chronic, treatment-resistant, thick nodular swellings of the superficial dermis and epidermis, occasionally with ulceration. It is caused by a fungus, Loboia loboi (syn. Lecazia loboi). Although the lesions in humans and dolphins are quite similar, there are subtle morphological differences in the organisms in the lesions (Haubold et al., 2000). In humans, Lobo's disease is a disease of the Central and South American tropics, and in dolphins it ranges from the Gulf of Mexico, mainly Florida, to South America.

Protozoal Infections

Toxoplasma gondii

Toxoplasmosis (infection with T. gondii), has been reported in a variety of marine mammals, including a West Indian manatee (Buergelt and Bonde, 1983), several pinnipeds (Migaki et al., 1977; Holshuh et al., 1985), stranded Atlantic bottlenose dolphins (Inskeep et al., 1990),
Pacific spinner dolphins (*Stenella longirostris*) (Dubey and Beattie, 1988; Migaki et al., 1990), belugas (*Delphinapterus leucas*) (Mikaelian et al., 2000), and a long-time captive killer whale (*Orcinus Orca*) (Cowan, unpubl. data). The animals were found in both the Atlantic and Pacific Oceans, were in collections and free-ranging, and the lesions ranged from incidental to disseminated and fatal. The mode of transmission in these animals is not known, and while humans are certainly susceptible to toxoplasmosis, there are no reports of transmission to humans from a marine mammal.

**Cryptosporidium** spp.

*Cryptosporidium* oocysts morphologically, immunologically, and genetically indistinguishable from *C. parvum* and *C. duodenalis* obtained from infected domestic cattle have been recovered from feces of California sea lions, suggesting that the sea lion could serve as a reservoir for environmental transmission of this organism (Deng et al., 2000).

**Giardia** spp.

*Giardia* spp. cysts have been isolated from fecal material from harp seals (*Pagophilus groenlandicus*), gray seals (*Halichoerus grypus*), and harbor seals in eastern Canadian waters (Measures and Olson, 1999), from ringed seals in western Arctic Canada (Olson et al., 1997), and from California sea lions in northern coastal California (Deng et al., 2000). The transmission of these organisms between marine mammals and humans has not been demonstrated, and little is known about the strain types found in marine mammals. However, their potential presence in feces should be remembered when handling marine mammals.

**Potential for Transmission of Infectious Disease from Marine Mammals to Humans**

Several observations emerge from personal experience and review of the literature. One is that wild animals may be very sick with infectious disease and yet show remarkably few signs of disease until shortly before death. The implication is that reasonable precautions against transmission of infection must be taken around all marine mammals, whether they appear to be healthy or not. Face protection should be worn whenever an animal’s breath can be exhaled into the face of a handler. Food handlers and tank cleaners should take full precautions. Persons with open cuts or abrasions should not be permitted exposure to blood or secretions from marine mammals, or the water in which they live. Pregnant women and people with chronic illness, especially liver disease, or any form of immune suppression, should not be permitted close exposure to marine mammals. Gloves and other protective gear should be worn during post-mortem examination.

Review of the possibilities of infection, except for a few virus infections, indicates that documented instances of infection are rare, except in the case of inoculation, as in seal finger. Although uncommon, infection of a marine mammal with a species of *Mycobacterium* may have a relatively high risk of transmission to a handler. These infected animals may be very difficult to recognize clinically, before culture. In 10 years of contact with many dolphin necropsies and with rehabilitating live strandings with the Texas Marine Mammal Stranding Network, the authors have not recognized a single instance of transmission of infection from dolphin to human. This might relate to the general good health and high resistance of people working with these animals, but might also be related to serotypes of the potential bacterial pathogens. Identification by culture alone does not mean that the organism is an agent of great risk under
ordinary circumstances. Streitfeld and Chapman (1976) examined dolphins and healthy human attendants from two oceanaria by bacteriological culture. Although coagulase-positive Staphylococcus spp. were recovered from blowholes of eight dolphins (one with respiratory tract infection) and from 14 people, antibiotic sensitivity and phage typing indicated that the Staphylococcus spp. found on dolphins and humans were not shared. Types were consistent within the dolphins, and within the humans, but did not occur across the species.

Infection from a marine mammal source may begin subtly, without preceding incident, or following an encounter such as a bite or scratch. When seeking treatment for any possibly infectious condition, the history of contact with a marine mammal should be presented, since it is not something that the average physician would think to ask.

As a general practice, a full clinical history of the bite victim and the biting animal should be taken. If the biting animal was showing neurological symptoms, the possibility of rabies should be the physician’s concern. The animal can be euthanatized, and brain tissues can be submitted to a public health laboratory certified for rabies diagnosis. The submission information should clearly state “A Rabies Suspect.” The bite victim’s medical history will allow the physician to determine if a tetanus booster is advisable. If the history indicates that the patient is immunologically compromised, a wider range of microorganisms should be considered as potentially pathogenic in that individual.

Acknowledgments

The authors thank Bill Van Bonn, Teri Rowles, Jan Kovach, and Jim Hurley for their helpful comments in reviewing this chapter.

References


