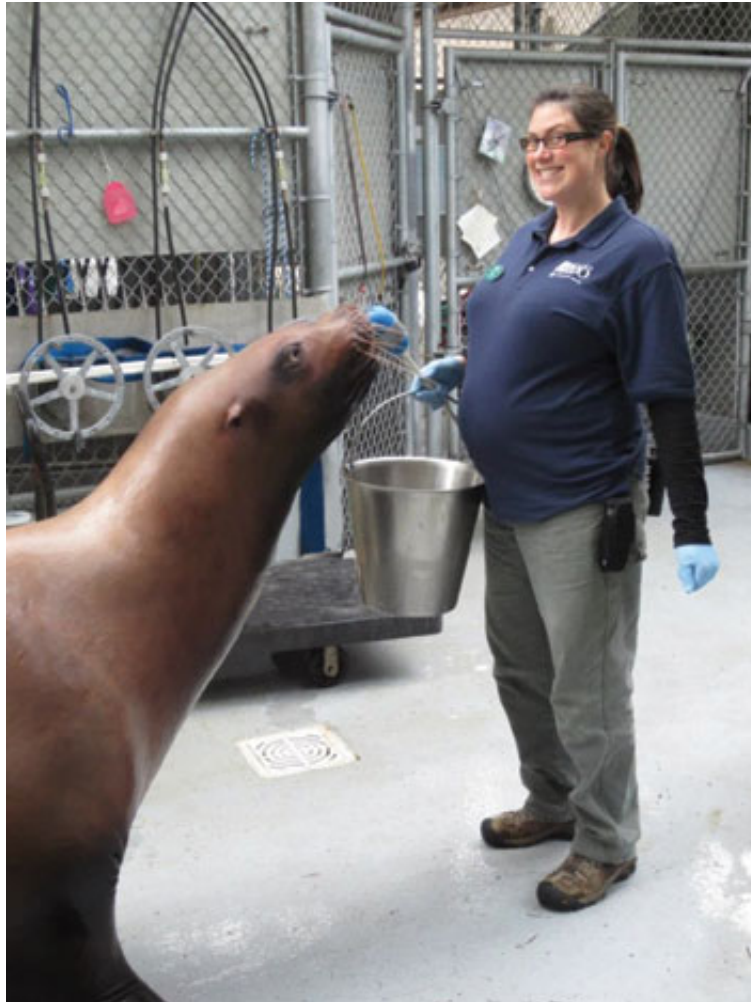


## What's Up Doc?

Which animal-transmitted diseases should a marine animal trainer be aware of?



Pregnancy puts keeper Sara Morgan at a higher risk for zoonoses. Wearing protective equipment, such as gloves, helps reduce the risk.

Photo Credit: Oregon Zoo

There are many types of bacteria, fungus, viruses and parasites that can be transmitted between marine animals and their trainers. The diseases that they cause are called zoonoses (“zoh–oh–no–sees”), and the germs themselves are zoonotic agents. Although the number of potential zoonotic agents is too plentiful to list here, the good news is that most zoonoses can be prevented with basic hygiene practices including hand-washing (a full 20 seconds!), use of protective equipment (gloves, masks, and boots), and proper cleaning of dive equipment

(wetsuits, drysuits, dive masks, and mouthpieces). Pregnant or immunosuppressed staff members will have specific concerns about contact with animal-origin infectious agents. Ask your facility's dive safety officer, veterinarian or occupational health physician for recommendations unique to your situation, or go to the following website document for a good start: [http://swfsc.noaa.gov/uploadedFiles/Divisions/PRD/Programs/Photogrammetry/Marine\\_Mammal\\_Zoonoses\\_Final\\_Report-2.pdf](http://swfsc.noaa.gov/uploadedFiles/Divisions/PRD/Programs/Photogrammetry/Marine_Mammal_Zoonoses_Final_Report-2.pdf). There is also a much more recent marine mammal zoonoses review article written by Waltzek, Cortés-Hinojosa, Wellehan Jr., and Gray (2012) from the University of Florida that can be found at <http://www.ncbi.nlm.nih.gov/pubmed/22697432>.

Many bacteria that are naturally occurring in marine and freshwater environments can be disease-causing (pathogenic) in people, either by contact with an infected animal or with contaminated water from a marine or aquatic enclosure. In animal care staff, skin wounds are common, regardless of whether they are caused by our physically demanding jobs, a simple paper cut, or an actual animal bite. Mycobacteria such as *Mycobacterium marinum*, *M. fortuitum* and *M. ulcerans* are commonly present in the water our animals live in, and they can cause skin abscesses or deeper infections, especially when they contaminate abrasions or puncture wounds. "Fish handler's disease" is a common name for a zoonotic mycobacterial infection. Mycobacterial infections require specific drugs for effective treatment, so make sure your physician is aware of the possibility of mycobacteriosis if you are seeking care for a skin wound or abscess that doesn't look like it is healing quickly enough. Other zoonotic skin infections include "seal finger" (caused by *Mycoplasma* spp. or *Erysipelothrix*), "beluga finger", and others caused by *Bisgaardia*, poxvirus, calicivirus (San Miguel sea lion virus), herpes virus, *Pseudomonas*, *Staphylococcus*, *Clostridium perfringens*, *Vibrio*, *Corynebacterium*, *Nocardia*, *Aeromonas*, *Klebsiella*, *Edwardsiella*, *Lacazia* fungus (lobomycosis), and *Candida* fungus. There is no magic drug that will treat all of these possibilities, but if your physician is made aware of the infectious agents that might be making your wound worse, his or her treatment plan will be more effective. And remember, dilution is the key to resolving pollution; thorough washing of the wound (even with tap water, if that is all you have got) will go a long way toward preventing a more serious infection.

Skin disease is not the only thing to watch for related to marine animal origin zoonotic agents. Many types of symptoms and body organ systems can be involved with zoonotic disease, including respiratory signs, eyelid irritation (conjunctivitis), diarrhea, neurological disease, kidney failure, or general flu-like malaise symptoms. Some of these zoonotic agents include mycobacteria (including those that cause tuberculosis), *Brucella*, *Leptospira*, *Erysipelothrix*, *Salmonella*, *Plesiomonas*, *Candida* yeast, *Aspergillus* fungus, influenza virus, and the parasites *Baylisascaris*, *Cryptosporidium* and *Strongyloides*. When diving to clean an animal enclosure, your lips and ears are vulnerable to contamination with fecal-related bacteria, almost all of which can cause human illness. As with wounds, rinsing your mouth either with lots of tap water or dilute chlorhexidine mouthwash after a dive will help to reduce the potential for contamination and infection.

Prey meat (fish, poultry, beef, horsemeat) fed to marine animals can contain or be contaminated with zoonotic agents, which can transfer to the person preparing or feeding out these diet items. Gloves should be worn when preparing diets or during feeding sessions, to reduce your risk of zoonotic disease. Not considered infectious diseases, but still of concern, are the toxins that can be encountered when working with marine mammal carcasses, for example, brevetoxins in the gastrointestinal tract (or even in the air of a surf zone where a large animal might be necropsied), or domoic acid in urine or feces. Take time to stock up on functional personal protective equipment for necropsies, including masks that still allow you to breathe, coveralls or tyvek suits that allow some ventilation (you can cut a large oval out along your back), and safety glasses or goggles that do not fog up. As with most diseases, an ounce of prevention is worth a pound of cure.

Of course, the risk of acquiring a zoonotic disease is low compared to the enjoyment and fulfillment that we get from working with marine animals. Being aware of disease transmission risks will hopefully keep both you and your animals healthier.