

Zoonoses - Disease Transmitted from Animals to Humans

Our topics for this week are:

- What are zoonoses?
- How to prevent transmission of zoonoses

A zoonosis is any infectious disease of animals that can be transmitted to humans under natural conditions. Of the more than 1400 known infectious diseases of humans, 60% are zoonotic. Most are associated with the gastrointestinal tract and transmission is fecal-oral. More than 50 zoonotic diseases are known to be present in the U.S. Examples include rabies, salmonellosis, cryptosporidiosis, plague, sporotrichosis, psittacosis, and ringworm. Routes of transmission of zoonotic diseases include contact, aerosol, and vector-borne. Every animal can carry some diseases that humans could acquire. However, handling apparently healthy domestic animals using basic sanitary practices, such as keeping hands away from eyes, nose, and mouth, keeping skin cuts covered, and washing hands after handling animals carries very little risk of acquiring zoonotic disease. Stressful handling, including prolonged transportation, or overcrowding of animals can increase the risk of animals shedding disease organisms. The actual incidence of diseases transmitted from animals to humans is not clear, but the reported frequency is no doubt low compared to actual occurrence. Non-fatal zoonoses are under-diagnosed and under-reported.

The risk of disease transmitted from animals is greater among people with immature or impaired immune systems. Children, 5-years-old or younger, should have supervised exposure to animals due to immature immune systems and a tendency to put unwashed hands in their mouths. Animal handlers that are more than 70-years-old may have increased risk of zoonoses from declining immune responses. Some conditions, diseases, or treatments in humans, regardless of their age, may lower their resistance to zoonoses. These diseases include systemic diseases such as HIV, congenital immunodeficiencies, diabetes mellitus, chronic renal failure, alcoholism, liver cirrhosis, malnutrition, and certain cancers. Pregnancy may also reduce the nonpregnant immune response. Treatments for cancer, organ or bone marrow transplants, and autoimmune diseases that depress immunity. Splenectomy and long-term hemodialysis are also treatments that can suppress immunity. Young children and immunosuppressed adults should especially avoid nursing calves, all reptiles, and baby chicks and ducklings.

High-risk animals for transmitting zoonoses are the young, females giving birth, and unvaccinated, stray, or feral animals. Others include those fed raw meat diets, kept in crowded conditions, and with internal or external parasites. In addition, most reptiles and wild or exotic species are high-risk sources of zoonotic diseases.

Keeping animals healthy can also reduce the risk of zoonosis and transmission to humans. Routine veterinary care, vaccinations, and parasite screenings should be maintained. High quality food is advisable. Dog, cat, or ferret foods that contain any supplementary egg, poultry, or meat products should have been adequately cooked. Raw pet foods can be sources of zoonotic bacteria, such as *Salmonella*. Pets should be prevented from drinking from toilet bowls or eating

garbage, hunting wildlife, or eating other animal's feces. All pets should be kept away from areas where human food is prepared.

Hand washing is essential to controlling the transmission of disease. Proper hand washing procedure is to:

1. Clean fingernails and remove rings
2. Wet hands
3. Apply an olive-size amount of liquid soap to a palm
4. Scrub both hands while counting to 20, slowly
5. Rinse thoroughly and dry with paper towels

All animal handling locations should have a means for handlers to wash hands. Animal handlers should keep their fingernails short and, if necessary, use moisturizers to keep the skin from cracking and creating portals of disease entry. Alcohol-based rubs are effective against most disease-producing agents if the hands are not visibly soiled with organic material.

If bitten or scratched, the wound should be thoroughly cleaned with warm soapy water, compression should be applied if bleeding persists, and a physician should be consulted. Special precautions are needed if working with animals with diarrhea, or skin or mouth sores. Pregnant women should not handle cat litter or ewes in the process of lambing.

All animal handlers should be vaccinated against tetanus every 10 years, as recommended by the U.S. Centers for Disease Control. Horse handlers are particularly at risk. Handlers of hogs or poultry should be vaccinated with the current human influenza virus vaccine.

Some animal-related diseases are transmitted to humans indirectly via ectoparasite vectors, such as mosquitoes (encephalitis viruses), ticks (Rocky Mountain Spotted Fever and many others), and fleas (Cat Scratch Disease). The animal carrying the ectoparasite may or may not become ill. Control of ectoparasites on animals to be handled is important to the animal's and the handler's health. Ectoparasites are controlled in dogs and cats with individually applied topical insecticides and acaricides. Livestock are protected using dusters, dust bags, back rubbers and oilers, pour-ons, impregnated ear tags, feed-through larvacides, or boluses of insect growth regulators. Premise control may include sprays, traps, and baits. Yards need to be mowed frequently enough to keep grass height short.

Pastures and pens should be either cleaned of manure or harrowed on a weekly basis. Manure piles and other compost should be turned weekly.

Rodents and birds can also be disease vectors. These are controlled by eliminating entry to animal dwellings and hiding places. Access to food sources should be eliminated by maintaining food storage in rodent-proof sealed containers and proper disposal of garbage.

Means of exposure to zoonoses are varied. Direct transmission can be contact with animal saliva, blood, urine, or feces with handler eyes, nose, or mouth which can occur from splashing of body fluids or eating, smoking, or touching the face. Contamination of a skin cut, scratch, or crack with animal saliva, blood, urine, or feces are also forms of direct transmission. Indirect transmission can include inhalation of contaminated dust. Vector-borne indirect transmission can be the bite of a fly, mosquito, tick, or flea carrying a zoonotic organism.

Personal protective equipment (PPE) should be considered in possible zoonotic risk

situations. PPE can include protection of the eyes with properly fitted goggles or ANSI-approved face masks. Protection for the torso can be lab coats, coveralls, gowns, or aprons. Long sleeves protect against scratches and splashes. The scalp can be partially protected from exposure to cuts, splashes of infectious liquids, and ringworm with a hat. Ears should be protected from excessive noise with ear muffs or molded ear plugs (cotton plugs are insufficient). Feet may be protected with closed-toe, slip resistant, water impermeable shoes or boots. Hands are typically protected with rubber or nitrile gloves.

Now, let's recap the key points to remember from today's episode:

- Thoroughly wash your hands after feeding or touching animals or moving their waste; do not dry hands on clothing
- Do not permit animals to eat from human plates or utensils
- Keep pets supervised to prevent hunting at will and do not feed raw meat
- Do not eat or drink in animal handling areas
- Wear appropriate clothing when handling animals
- Do not kiss animals
- Wash cuts thoroughly
- Wear gloves when gardening
- Keep animal environment reasonably clean and prevent children from playing where there is animal waste. For example, covers should be kept on children's sand boxes when not in use.
- Clean cat litter daily and wash your hands immediately afterwards
- Keep animals from household areas where human food is prepared or handled
- Do not bathe pets in sinks or bathtubs used by humans
- Deworm animals on regular basis and provide reasonable control of fleas, ticks, and mosquitoes
- Avoid stray animals
- Do not keep wild animals as pets
- Vaccinate animals against zoonotic diseases and maintain tetanus vaccinations in all animal handlers
- Use proper low-stress handling techniques and containment practices and facilities to reduce stress-induced shedding of zoonotic diseases
- Routinely train animal handlers on the prevention of zoonotic disease and animal handling safety measures

More information on animal handling is available in my book, *Animal Handling and Physical Restraint* published by CRC Press. It is also available on Amazon and from many other fine book supply sources.

Additional information is available at <https://www.betteranimalhandling.com>

Don't forget serious injury or death can result from handling and restraining some animals. Safe

and effective handling and restraint requires experience and continual practice. Acquisition of the needed skills should be under the supervision of an experienced animal handler.

References

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